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DE LAS FUERZAS ARMADAS

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Suat UNVER

He was born on 28 May 1968 in Erzurum, Turkey. He completed his K-12 education in Konya. He past the university exam in 1985 with remarkable points and enthusiasm. Suat started his education to be a Medical Doctor at Gülhane Military Academy of Faculty in Ankara. He graduated in 1991 and became a Medical Doctor in the Navy. He was assigned to Gülhane Haydarpasa Training Hospital Istanbul in 1994 to study Internal Medicine specialty. In 1998, He got his Internal Medical Specialist degree with sensational performance and right after graduation, he started to work at Izmir, Foca and Balıkesir, Erdek private infirmaries as an Internal Medical Specialist and Field Manager until 2000. Suat began to study his second Specialty on Nephrology field in 2000. After 2 years successful education, he got his second Specialist degree on Nephrology. Suat has been working at Gülhane Haydarpasa Training Hospital Istanbul as an Internal Medicine and Nephrology specialist.

Keywords: Hemodialysis, Catheter-related bacteremia, Flora.

INTRODUCTION

Vascular access way is described as Achilles’ heel of hemodialysis treatment. Hemodialysis vascular access catheters are encountered as an important component of dialysis practice. It supplies vascular access in a short time and it benefit for its later use in both the acute renal failure and terminal renal failure patients who have not permanent access ways. Mechanical and infectious complications, cause to morbidity and to removing the catheter, may occur during use of the catheters. In spite of their drawbacks, they cannot live without them. Catheter-related bacteremia (CRB) is the most important infectious complication of hemodialysis catheters(1, 2, 3). The catheters in which the results from the catheter and blood culture were identical was classified as CRB. Bad individual hygiene, using of occlusive transparent dressing, sweat collection at exit site of the catheter are high risk factors for CRB(4). Staphylococcus aureus nasal carriage and cutaneous colonization are also risk factors for systemic infections(5, 6, 7, 8). The aim of this study was investigate the relation between body flora and infectious complications occurred during use of temporary catheter replaced for hemodialysis treatment.

MATERIAL AND METHODS

In this study, 27 CRB cases in Nephrology Department of our hospital were included. Femoral catheters were excluded in the study. In the study, it was used the polyurethane catheters with double tunnelled, uncarpeted, diameters of 11 to 12 F, length of 15 cm (Medcomp Harleysuille, PA, USA, Arrow Pennsylvania, USA).
Subclavian catheterization was carried out when internal jugular vein catheterization was unsuccessful, and it was recorded the number of puncture performed until it was reached to the vascular lumen. After disinfection with povidone-iodine, using large holed dressing, according to asepsis-antisepsis rules, without ultrasonographic guidance, the catheters were placed and sutured to skin. The catheter access site was controlled during all dialysis, and dressing was repeated if it had been necessary. After hemodialysis, the catheter lumen was filled with heparin (1000 U/ml) which was equal to volume of the lumen. The catheter was not used for another aim, and data was collected prospectively. It was taken from nasal, axillary, groin, hand skin, and catheter access sites cultures of all patients who was withdrawn, as well as blood and catheter cultures.

The catheters were cultured using a semi-quantitative technique on 5% sheep blood agar and eosine methylen blue (EMB) agar. Nasal, axillary, groin, hand skin, and catheter access sites swab samples were also cultures on 5% sheep blood agar and eosine methylen blue (EMB) agar. After incubation at 37°C for 18-24 hours, the media was evaluated and it was accepted as significant growing ≥15 CFU/ml. 27 cases whose the results of cultures were the same bacteria species and antibiotypes were included in the study. In the study, the isolates from nasal, axillary, groin, hand skin, and catheter access sites cultures were included if they had identical to those from blood or catheter cultures and were predominant bacteria. In addition, staphylococcal colonies were also accepted as significant from nasal, axillary, groin, hand skin, and catheter access sites cultures. Antibiotic susceptibility testing by standard disk diffusion methods was preformed for the isolates were the same species with those from catheter cultures. If antibiotic susceptibility pattern was same, these bacteria were accepted as identical strain phenotipically. Staphylococci carriage was also investigated for all cases. The significance among the variances was evaluated by chi-square, and supported by Spearman correlation test. All statistical analysis methods were performed by SPSS for Windows 11.0 program and it was accepted as significant p<0.005.

RESULTS

All cases consisted of the cases which had been drawn of their catheters because their infection source could not determined, despite they have infections signs. Of 27 cases in the study, 96.3% had gram positive bacteria culture. The most frequent microorganism was CoNS (37%). MRSA and MSSA had same rates (totally 59.2%) (Table 1). No fungal growing was detected. Antibiotic sensitivity pattern belong to micro organisms growth in catheter and blood culture was presented Table 2. Difteroid bacilli were isolated from catheter access site of 16 cases out of 27 CRB patients. Of these, 11 were obtained culture positivity which concordant with the results of catheter culture and it was statistically significant (p<0.0001, r:0.5911) (Table 3).

Mean catheterized time were 42.5±17.7 days. The longer catheterized time, the higher catheter access site culture positivity rate (p<0.0001, r:0.4463). The relation between the number of punctures and catheter access site culture positivity rate was also statistically significant (p<0.0001, r:0.3632).

Table 1: Overall patient characteristics.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>27</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
</tr>
<tr>
<td>Male</td>
<td>17</td>
</tr>
<tr>
<td>Age range (years)</td>
<td>20-78</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>53.5±17.6</td>
</tr>
<tr>
<td>Introductory of catheterization</td>
<td></td>
</tr>
<tr>
<td>Internal jugular vein</td>
<td>25</td>
</tr>
<tr>
<td>Subclavian vein</td>
<td>2</td>
</tr>
<tr>
<td>Average duration of leaving catheter in place (days)</td>
<td>42.5±17.7</td>
</tr>
<tr>
<td>MSSA</td>
<td>8</td>
</tr>
<tr>
<td>MRSA</td>
<td>8</td>
</tr>
<tr>
<td>CoNS</td>
<td>10</td>
</tr>
<tr>
<td>Pseudomonas spp.</td>
<td>1</td>
</tr>
</tbody>
</table>

MSSA: Methicillin-sensitive S. aureus, MRSA: methicillin-resistant S. aureus, MRCoNS: Methicillin-resistant coagulase-negative staphylococci.

Table 2: The sensitivity of staphylococci, which is the agents of CRB, isolated from catheter and hemoculture.

<table>
<thead>
<tr>
<th>BACTERIUM</th>
<th>MSSA (N:8)</th>
<th>MRSA (N:8)</th>
<th>CoNS (N:10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin</td>
<td>5 (63%)</td>
<td>0 (0%)</td>
<td>4 (40%)</td>
</tr>
<tr>
<td>Methicillin</td>
<td>8 (100%)</td>
<td>0 (0%)</td>
<td>5 (50%)</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>5 (63%)</td>
<td>6 (75%)</td>
<td>5 (50%)</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>6 (75%)</td>
<td>6 (75%)</td>
<td>6 (60%)</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>5 (63%)</td>
<td>5 (63%)</td>
<td>5 (50%)</td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>2 (25%)</td>
<td>2 (25%)</td>
<td>6 (60%)</td>
</tr>
<tr>
<td>Pucidic acid</td>
<td>7 (88%)</td>
<td>6 (75%)</td>
<td>7 (70%)</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>6 (75%)</td>
<td>5 (63%)</td>
<td>6 (60%)</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>8 (100%)</td>
<td>8 (100%)</td>
<td>8 (100%)</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>8 (100%)</td>
<td>8 (100%)</td>
<td>8 (100%)</td>
</tr>
</tbody>
</table>

Abbreviation is in table-1.
Only one *Pseudomonas spp.* was isolated from catheter access site.

Nasal staphylococci carriage was detected for 13 cases (48.1%) (Table 4). Of these 13 cases, in eight (61.5%) was obtained same phenotype with those of CRB. The relation between nasal staphylococcal carriage and CRB was significant (p=0.00002, r=0.3557).

Of 27 cases, in hand swab culture yielded three CoNS. This result was significant (p=0.0073, p=0.0035). The relation of hand and nasal flora was not found significant (p=0.0854, r=-0.0789).

It was not observed staphylococcal carriage in groin of any cases.

The antibiotic susceptibilities of staphylococcus isolates, have same antibiotype, form nasal, hand and catheter access site was shown in Table 5.

**DISCUSSION**

Bad individual hygiene, the use of a transparent occlusive dressing, the collection of moisture has been indicated as a risk factor for CRB. Staphylococcus aureus nasal carriage and cutaneous colonization are also risk factors for systemic infections like bacterial colonization of hemodialysis catheter. In our study, the results of catheter-access site culture were found consistent with those of catheter culture by 40.7% rate and it was detected strong correlation between both of them. Catheter-site culture positivity rate increased similarly to the number of punctures. We were not found any literature relating to investigation between catheter-site culture positivity rate and the number of punctures.

Zimakoff et al. found that catheter-related staphylococcal infection occurred most often in patients who had nasal colonization, and in more than half of the cases, it was with the same strain.

Primary permanent carriage rate in the patients with hemodialysis catheter is via nasal route with 44%. On the other hand, it was reported 2.4% permanent carriage in skin. *S. aureus* infection rate is 36.6% in these cases. It was reported CRB in 2/3 of these cases and the agent *S. aureus*. In our study, staphylococcal carriage rate was found 48.1%. It was detected positive correlation between nasal staphylococcal carriage and CRB. Nasal carriage constitutes an important risk factor for CRB.

Boelaert et al, in their 20-hemodialysis patients-studies, found that the carriage rates were 85% in skin and nose. They also implied that intranasal mupirocin eliminated *S. aureus* in both skin and nose. In view of these findings, it is necessary to give importance to prevent *S. aureus* carriage.

In our study, CoNS were growth in hand swabs of three of the patients with CRB. The relation between this growing and CRB was statistically significant. The relation between the growing in hand swabs and catheter site cultures was also significant. On the other side, no significant relation between the growing in hand swabs and nasal cultures was detected.

**Table 4:** The results of growth form nasal swab samples during withdrawing of the catheter.

<table>
<thead>
<tr>
<th>Bacterium</th>
<th>Number</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difteroid bacilli</td>
<td>14</td>
<td>51.9</td>
</tr>
<tr>
<td>MSSA</td>
<td>12</td>
<td>44.4</td>
</tr>
<tr>
<td>CoNS</td>
<td>1</td>
<td>3.7</td>
</tr>
<tr>
<td>MRSA</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 5:** The sensitivity of staphylococci, which have same antibiotype with that of CRB, isolated from nasal, hand skin, and catheter access site samples.

<table>
<thead>
<tr>
<th></th>
<th>MSSA (n:8)</th>
<th>MRSA (n:0)</th>
<th>CoNS (n:4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin</td>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Methicillin</td>
<td>8</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>5</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Levofloxacina</td>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Co-trimoxazole</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Fucidic acid</td>
<td>7</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>8</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Teicoplanin</td>
<td>8</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Abbreviation is in table-1.
In spite of high prevalence in CoNS in this study, lower CoNS prevalence in nasal and skin of the patients thought that the most catheter infections infer from hand of health care workers because they are not been pay attention sufficiently to asepsia-antisepsia rules.

Infectious of catheters, other foreign body infections occur as a result of interaction between host and foreign body\(^{[1]}\). Afterwards, glycocalix produced by microorganisms (especially CoNS and \(S.\) \(aureus\)) covers surface of catheter and a biofilm formation consist of this glycocalix and micro-colonies covers surface of the catheter. After eighth day, microorganism is buried into the biofilm in all central venous catheters. Several proteins such as fibronectine and fibrin, which are host factors, play a role in this process. In the present study, it was showed that \(S.\) \(aureus\) and CoNS, have a potential to colonize the catheter lumen, colonized catheter site from skin in degree of causing catheter infections. This colonization constitutes a serious threat for catheter infections in long-term or inappropriate-care catheters.

Schwab et al. defined hemodialysis catheters as “hate living with them, but can’t live without them”\(^{[1]}\). An important step to decrease vascular access-related infections should be to investigate and to prevent staphylococcal carriage. It should remember that an increase in the number of punctures during central vein catheterization increases the risk of bacteremia, so catheterization should carry out by guidance of ultrasound if it is possible. Because of relation between catheter access site and catheter infection, even care of this site, barrier measurements, education of patient and health care worker are other factors to contribute about this issue.

**ABSTRACT**

Our study investigated the relationship between bacteremia and body flora in 27 patients with CRB who were encountered during the use of transient catheters placed for hemodialysis. (In this study, we investigated the relationship between bacteremia and body flora in 27 patients with catheter-related bacteremia (CRB) occurred during the use of transient catheters placed for hemodialysis). For each patient whose catheter was removed due to the infection, hemoculture was made, as well as the catheter culture. Addition, concurrently swab specimens were taken from nasal and axillary areas, hand, and skin near to the catheter area. Gram-positive growth was detected in 96.3% of 27 cases with CRB (Female, 10; male, 17). On the culture samples concurrently taken from the catheter orifice, 11 cases were reported to have a positive culture consistent with the culture results. There was statistically significant relationship between the culture results of catheter orifice and catheter (p<0.0001). The greater the number of punctures was, the higher the significance of bacterial growth was (p<0.0001, r:0.3632). In the nasal cultures, 13 cases (48.1%) were determined as the carrier of staphylococcus (12 MSSA, 1 CoNS). There was also a significant relationship between the presence of nasal bacterial growth and CRB (p:0.00047). Significant bacterial growth was observed in three swabs from hand. There was statistically a significant relationship between positivity of culture from hand and the development of CRB (p:0.0073). Finally, staphylococcal carriage should be screened in patients with high risk for CRB and infection control rules should be increased.

**REFERENCES**

**QUALITÉ BACTÉRIOLOGIQUE DES PLATS CUISINÉS : ÉTUDE DANS 7 CUISINES D’UNITÉS NOURRICIÈRES DE LA GARNISON DE TUNIS.**

par M.L. SMAOUI, S. BAATOUT, S. HADDAD, A. GRITLI, M. RAACH, M. JEBALI et A. AGAL.

Tunisie.

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**INTRODUCTION**

Le contrôle sanitaire des denrées alimentaires d’origine animale est une des prérogatives du médecin vétérinaire militaire au sein du ministère de la défense tunisienne.

Un agréage avant la signature des marchés, est obli-

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**BUT**

C’est d’améliorer la qualité bactériologique des plats cuisinés par la mise en place des procédures d’hygiène lors de leur préparation et leur distribution afin de prévenir le risque d’apparition d’une toxic-infection collective (T.I.A.C.).

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**SUMMARY**

**BACTERIOLOGICAL QUALITY OF COOKED DISHES: STUDY IN 7 KITCHENS ARMY UNITS OF THE TUNIS GARRISON.**

To cook a healthful dish, remain a daily worry for the veterinary armies as well as for the chiefs of troops.

The present survey of the bacteriological quality of the dishes cooked has been done in 7 units belong to the three army (earth, sea and air) as well as to administration military units. The survey has been spread from November 2004 to February 2007 and concerned 1300 samples of food commodities and withdrawals of surface.

The results showed that the bacteriological quality of the dishes cooked change is tributary of the human factor in first line and the means of conservation of these dishes in the waiting of their distribution.

**Keywords:** Plat cuisiné, Qualité bactériologique, Prélèvements de surface, Epices.

---

S'agirait de redynamiser la qualité bactériologique des aliments pour les usines de production de denrées alimentaires : conserves, pâtes alimentaires, produits laitiers etc..., ou d’abattoirs de bovins, ovins, volailles et de lapins.

Aussi une estampille sanitaire vétérinaire militaire est créée depuis 1994 avec plombage des carcasses pour les bovins et ovins.

En plus, un contrôle sanitaire vétérinaire à la réception de tonte demnier alimentaire d’origine animale est effectué par le médecin vétérinaire militaire de la place qui délivre un certificat de salubrité.
Malgré ces contrôles sanitaires vétérinaires en amont, des défaillances hygiéniques restent encore à cerner touchant l’infrastructure des locaux de cuisines, du personnel cuisinier et du matériel de préparation et de conservation des denrées alimentaires.

L’étude de la qualité bactériologique des plats cuisinés, s’étalant du mois de novembre 2004 au mois de février 2007, a touché 7 unités militaires nourricières basées dans la garnison de Tunis.

Les cuisines de ces unités nourricières préparent entre 200 à 5 200 plats cuisinés par jour.

Plus de 1 300 échantillons de denrées alimentaires et de surface ont été prélevés puis analysés au Laboratoire Militaire d’Analyses Alimentaires.

**MATÉRIEL ET MÉTHODES**

1- **MATÉRIELS**

1-1 **PLATS CUISINÉS** :
On a utilisé les repas témoins prélevés quotidiennement par le personnel cuisinier.

Ces plats, chauds ou froids, sont conditionnés individuellement dans des barquettes en plastique alimentaire à usage unique (figure 1).

Chaque plat est identifié par sa date de préparation et par le temps de sa distribution (déjeuner ou dîner) conformément à la note ministérielle n° 31776/cab1 du 17 octobre 2001.

Les plats sont conservés après prélèvement, à une température de + 4 °C et pendant une durée de 48 heures.

Les délais entre la préparation du plat cuisiné et son prélèvement pour analyse varient entre 2 à 48 heures.

1-2 **PRÉLÈVEMENTS DE SURFACE** :
4 types de lames gélosées pliantes à double face ont été utilisées : flore totale-coliformes, flore totale-entérobactéries, flore totale-flore totale, flore totale-levures et moisissures (figure 2).

Ces lames sont appliquées pendant 10 secondes sur les surfaces de travail, de matériel et des mains du personnel cuisinier après désinfection.

Ensuite ces lames subissent une incubation à 37 °C pendant 24 heures et un dénombrement des colonies est effectué.

L’interprétation des résultats est faite en fonction du nombre de colonies comptées selon la grille qui suit :

<table>
<thead>
<tr>
<th>NOMBRE DE COLONIES COMPTÉES</th>
<th>INTERPRÉTATION DES RÉSULTATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-15</td>
<td>Satisfaisant</td>
</tr>
<tr>
<td>16-45</td>
<td>Douteux</td>
</tr>
<tr>
<td>&gt; 45</td>
<td>Non satisfaisant</td>
</tr>
</tbody>
</table>

2- **MÉTHODES**

L’étude a été menée sur 3 étapes :

2-1 **ÉTAPE N° 1** :
elle s’étale de novembre 2004 à décembre 2005, on a procédé à une évaluation de l'état d'hygiène des cuisines, de la conception des locaux, des moyens de conservation des matières premières ainsi que du personnel cuisinier.

Au cours de cette période, on a prélevé 370 plats cuisinés chauds et froids, 66 prélèvements de surface et 44 échantillons d’épices.

2-2 **ÉTAPE N° 2** :
elle a débuté de janvier 2006 jusqu’à février 2007 avec la mise en place d’un système de contrôle accompagné d’une évaluation des mesures correctives uniformes pour les 7 cuisines.

Les étapes chronologiques suivantes ont été suivies :

- Élaboration des fiches techniques de procédures
Anthos belongs to the Cefla Dental Group brand portfolio. Part of CEFLA, a global corporate entity with diverse business interests, Cefla Dental Group is one of Europe’s leading manufacturers of dental equipment. Supported by a global distribution service and network of qualified technical advisors, Cefla Dental Group supplies integrated treatment centres, multimedia devices and latest generation digital radiology systems.

Internationally recognised suppliers of dental equipment, Anthos is a historical Italian manufacturer of dental units since 1947 and MyRay, one of the latest brands to be launched by Cefla Dental Group, offers cutting-edge devices for digital imaging and ultra-modern radiology, specifically designed for dentists.
de nettoyage et de désinfection des matières premières, des ustensiles, des locaux de préparation et des moyens de froid de conservation\(^1, 2, 3, 4\).

- Élaboration d’une fiche technique pour le prélèvement et la conservation du plat témoin.
- Affichage de ces fiches techniques de procédures dans les locaux concernés.
- La tenue de séances éducatives et de sensibilisation pour l’application de ces procédures pour le personnel cuisinier permanent.
- Un contrôle médical systématique du personnel cuisinier permanent tous les 6 mois.
- L’augmentation du nombre des prélèvements des échantillons à raison d’une fois par mois.

2-3 ÉTAPE N° 3:
Au cours de cette période, on a prélevé 525 plats cuisinés, 134 prélèvements de surface, 134 échantillons d’épices et 29 échantillons d’eau.

A la lumière des résultats bactériologiques de ces échantillons prélevés, une analyse et une interprétation des mesures correctives mises en place ont été réalisées.

RÉSULTATS

1- ÉVALUATION DE L’ÉTAT D’HYGIÈNE
L’évaluation de l’état d’hygiène des cuisines, de la conception des locaux, des moyens de conservation des matières premières ainsi que du personnel cuisinier a donné les résultats indiqués au tableau n° 1.

<table>
<thead>
<tr>
<th>Tableau n° 1 : Evaluation de l’état d’hygiène.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MARCHÉ EN AVANT</strong></td>
</tr>
<tr>
<td><strong>ÉPLUCHE</strong></td>
</tr>
<tr>
<td>Existence</td>
</tr>
<tr>
<td>Isolée des autres locaux</td>
</tr>
</tbody>
</table>

| **BOUCHERIE**                                |
| Existence                                    |         | 2 |              | 5 |
| Isolée des autres locaux                     |         | 1 |              | 1 |

| **SALLE DE CUISSON**                         |
| Espace suffisant                             |         | 5 |              | 2 |
| Isolée des autres locaux                     |         | 5 |              | 2 |
| Matériel vétuste                             |         | 5 |              | 2 |
| Ventilation                                  |         | 4 |              | 3 |

| **PLONGE CUISINE**                           |
| Plonge cuisine                               |         | 2 |              | 5 |

| **CABANON**                                  |
| Estrades surélevées ou étagères              |         | 7 |              | 0 |
| Aération                                     |         | 4 |              | 3 |

| **LOCAL DE DÉSEMBALLAGES OU DE DÉBOÎTAGES**   |
| Estrades surélevées ou étagères              |         | 7 |              | 0 |
| Aération                                     |         | 4 |              | 3 |

| **CONSERVATION DES DENRÉES ALIMENTAIRES**    |
| **PÉRISSEABLES**                             |
| Viande                                       |         | 4 |              | 3 (2 à volume réduit et 1 inexistant) |
| Produits laitiers et œufs                    |         | 4 |              | 3 (2 à volume réduit et 1 en panne) |
| Légumes et fruits                            |         | 5 |              | 2 (1 à volume réduit et 1 inexistant) |

| **RÉFECTOIRE**                               |
| Etat des tables et chaises                   |         | 7 |              | 0 |
| Rangement des ustensiles                     |         | 6 |              | 1 |
| Plonge                                       |         | 5 |              | 2 (inexistantes) |
| Lave mains à l’entrée                        |         | 4 |              | 3 (inexistants) |
| Table réfrigérante                           |         | 0 |              | 7 (inexistants) |
| Table chauffante                             |         | 0 |              | 7 (inexistants) |

| **HYGIÈNE DU PERSONNEL**                    |
| Visite médicale                              |
| Personnel permanent                          |         | 7 |              | 0 |
| Personnel non permanent                      |         | 0 |              | 7 |
| Tenue de travail                             |
| Personnel permanent                          |         | 7 |              | 0 |
| Personnel non permanent                      |         | 0 |              | 7 |
| Vestiaire et bloc sanitaire                  |         | 2 |              | 5 (inexistants) |

- Revue Internationale des Services de Santé des Forces Armées -
- International Review of the Armed Forces Medical Services -
2- **RÉSULTATS BACTÉRIOLOGIQUES** :

Les critères microbiologiques retenus pour l’interprétation des résultats bactériologiques sont celles indiquées dans l’arrêté du 21 décembre 1979(5).

2-1 **ÉCHANTILLONS PRÉLEVÉS DE NOVEMBRE 2004 À DÉCEMBRE 2005 (diagramme n° 1) :**

Les résultats bactériologiques obtenus au cours de cette période ont montré que :
- sur les 370 plats cuisinés prélevés, 22% plats de résistance et 65% salades ont un résultat bactériologique non satisfaisant.
- sur les 66 prélèvements de surface effectués, 59% ont un résultat bactériologique non satisfaisant.
- sur les 44 échantillons épices prélevés, 15% ont un résultat bactériologique non satisfaisant.

2-2 **ÉCHANTILLONS PRÉLEVÉS DE JANVIER 2006 À FÉVRIER 2007 (diagramme n° 2) :**

Les résultats bactériologiques obtenus au cours de cette période ont montré que :

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**Diagramme n° 1 : Qualité bactériologique des échantillons prélevés novembre 2004 - décembre 2005.**

<table>
<thead>
<tr>
<th>Échantillon</th>
<th>Satisfaisant</th>
<th>Non satisfaisant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salade</td>
<td>40</td>
<td>73</td>
</tr>
<tr>
<td>Plat de résistance</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Prélèvement de surface</td>
<td>27</td>
<td>39</td>
</tr>
<tr>
<td>Salade</td>
<td>37</td>
<td>7</td>
</tr>
</tbody>
</table>

**Diagramme n° 2 : Qualité bactériologique des échantillons prélevés janvier 2006 - février 2007.**

<table>
<thead>
<tr>
<th>Échantillon</th>
<th>Satisfaisant</th>
<th>Non satisfaisant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salade</td>
<td>76</td>
<td>40</td>
</tr>
<tr>
<td>Plat de résistance</td>
<td>36</td>
<td>46</td>
</tr>
<tr>
<td>Prélèvement de surface</td>
<td>88</td>
<td>54</td>
</tr>
<tr>
<td>Epices</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>Eau</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
- sur les 525 plats cuisinés analysés, 9% plats de résistance et 40% salades ont un résultat bactériologique non satisfaisant avec une augmentation de 17% du nombre d’échantillons prélevés.

- sur les 134 prélèvements d’échantillons d’épices analysés, 60% ont un résultat bactériologique non satisfaisant avec une augmentation de 51% du nombre d’échantillons prélevés.

- sur les 134 prélèvements de surface analysés, 34% ont un résultat bactériologique non satisfaisant avec une augmentation de 34% du nombre d’échantillons prélevés.

- sur les 29 prélèvements analysés d’échantillons d’eau, 100% ont un résultat bactériologique satisfaisant.

**DISCUSSION**

Après la mise en place des mesures d’hygiène correctives durant les étapes de préparation et de distribution des plats cuisinés accompagnées d’une accentuation des rythmes des prélèvements avec une périodicité mensuelle, on a constaté une amélioration de la qualité bactériologique pour :

- les plats de résistance : un accroissement du taux des résultats satisfaisants de 13%.

- les salades : une augmentation du taux des résultats satisfaisants de 25%.

- les prélèvements de surface : une élévation du taux des résultats satisfaisants de 25%.

En détaillant les résultats des prélèvements de surface, on a constaté une persistance du manque d’hygiène des mains du personnel cuisinier, des tables de réfectoire et des congélateurs comme le montre le diagramme n° 3.

Ces résultats montrent que le personnel cuisinier non permanent (généralement des soldats), occupant les postes de nettoyage et de désinfection : des matières premières avant traitement (épluche, boucherie, etc…), des surfaces de travail, du matériel de conservation et des ustensiles des réfectoires, reste un facteur de contamination prépondérant dans toutes les étapes de préparation et de distribution du plat cuisiné.

Concernant les épices, une détérioration de leur qualité bactériologique est relevée avec un accroissement du taux des résultats non satisfaisants de 45% et une prédominance des levures et des moisissures et des anaérobies sulfito-réducteurs qui ont même été décelés dans des plats cuisinés. Ces épices sont achetées en grains puis subisent un tamisage et un séchage à l’ordinaire puis un broyage à l’extérieur de l’unité. Chaque étape citée précédemment, représente à elle seule une étape d’altération de la qualité bactériologique des épices.

**CONCLUSION**

L’étude a démontré qu’en dépit du contrôle en amont et à la réception des matières premières alimentaires avec la mise en place de procédures d’hygiène de préparation du plat cuisiné, l’affinement de la qualité bactériologique des plats cuisinés reste dépendante d’une rénovation de la conception des locaux, de l’utilisation du matériel adéquat pour la conservation du plat avant sa distribution et surtout par une amélioration du niveau de formation en hygiène de la main-d’œuvre permanente avec l’écartement du personnel non permanent des cuisines.

*Diagramme n°3: Qualité bactériologique des prélèvements de surface janvier 2006 - février 2007.*
Cuisiner un plat salubre, reste un souci quotidien pour les médecins vétérinaires des armées ainsi que pour les chefs du corps de troupe.
La présente étude de la qualité bactériologique des plats cuisinés s’est déroulée dans 7 unités appartenant aux trois armées (terre, mer et air) ainsi qu’à unités administratives militaires.
L’étude s’est étalée de novembre 2004 à février 2007 et a touché 1 300 échantillons de denrées alimentaires et de prélèvements de surface.
Les résultats ont montré que l’altération bactériologique des plats cuisinés reste tributaire du facteur humain en première ligne et des moyens de conservation de ces plats dans l’attente de leur distribution.

REFERENCES

Los atentados terroristas del 11 de marzo de 2004 en Madrid.*

per J. RELANZON⁰.
España.

--- RESUME ---

LES ATTENTATS TERRORISTES
DU 11 MARS 2004 À MADRID.

Le 11 mars 2004, le champ de bataille de la guerre actuelle se concentrait sur quatre trains. À 7 h 40, heure de pointe, ils étaient bondés de travailleurs et d’étudiants qui rejoignaient leurs lieux de travail et universités.

 Dix bombes ont exploé dans les quatre trains provoquant ainsi 191 morts et 1871 blessés.

Le drame mit à l’épreuve tout le système sanitaire de la province de Madrid. Des milliers de professionnels du secteur de la santé, 4 hôpitaux de campagne, 300 ambulances, une centaine de médecins légistes, un millier de psychologues, la police et les pompiers ont été mobilisés.

Il a fallu se surpasser pour faire face au défi qui était lancé : des dizaines de morts et des centaines de blessés dans chacune des 4 zones d’impact.

Cette horrible situation prouve l’importance des exercices périodiques de simulation face à ce genre de catastrophe.

Grâce à cela, on pourra affronter ces catastrophes avec une meilleure organisation qui s’avèrera essentielle dans la gestion de ce genre de crises.

Cette organisation couvre une large gamme d’actions, depuis la mobilisation et le déploiement rapide d’effectifs sanitaires, le comportement dans les zones d’impact, la précision dans le triage, l’évacuation en suivant des critères de priorité des blessés et une répartition dans tous les hôpitaux, jusqu’à l’identification de cadavres et d’aide psychologique aux blessés et aux familles.

--- SUMMARY ---

THE TERRORIST ATTACKS
OF MARCH 11, 2004 IN MADRID.

That day, the battlefield of the current war was four trains at 07.40 h, the rush hour, crowded of workers and students that were going to theirs factories and universities.

Ten bombs exploded in four trains provoking 191 dead people and 1871 injured-ones.

The event tested the whole sanitary system of the province of Madrid. Thousands of sanitary professionals, four hospitals of campaign, 300 ambulances, a hundred of forensic, a thousand of psychologists and thousands of policemen and firemen were mobilized.

It was necessary to overcome all kinds of challenges. There were dozens of dead people and hundreds of injuries-ones in each of the four areas. There was revealed the importance of making periodic exercises in management of catastrophes, only that way it will be possible to develop a good organization that is the key in crisis handling from the mobilization and rapid deployment of sanitary workforce, performance in the zones of impact, precision in the triage, evacuation following criteria of priority of the severe injured people and maximum dispersion throughout all the hospitals, up to the identification of corpses and psychological support to wounded people and relatives.

Palabras Claves: Terroristas, Bombas, Recursos movilizados.

2- Calle Téllez. - Cuatro bombas hicieron explosión en un tren en marcha cuando estaba próximo a entrar en la estación de Atocha. Hubo 65 muertos.

3- Estación del Pozo. - Explosiónan dos bombas en un tren de dos alturas, provocando 67 muertos.

4- Estación de Santa Eugenia. - Una bomba provocó 16 muertos.

El número oficial de víctimas fue de 2062, de ellas 177 fueron muertos en el acto, 9 murieron en las primeras 24 horas y 5 mas murieron en unos días. El número total de muertos fue 191.
La atención extrahospitalaria en Madrid la realizan los servicios del SAMUR y SUMMA 112, que realizaron un gran esfuerzo de movilización de recursos: 215 profesionales sanitarios, 173 voluntarios en siniestros, 157 de apoyo logístico, 94 vehículos. Atendieron a 388 víctimas y trasladaron a 274 heridos.

En cada una de las cuatro zonas de impacto, se establecieron dos áreas:
- La zona de rescate y salvamento, responsabilidad de la policía y de los bomberos. Evacuación de las víctimas desde el interior de los trenes hacia la zona exterior.
- La zona de socorro. En la proximidad de cada una de las cuatro zonas de impacto se establecieron puestos médicos avanzados, bien con instalaciones desplegables o utilizando un polideportivo. Allí se realizaba la estabilización y el primer triage:
  - Verde: pueden andar.
  - Amarillo: pueden aguantar.
  - Rojo: precisan evacuación urgente.
  - Negro: ya no se les puede ayudar.

EVACUACION

En los momentos inmediatos después de las explosiones, se produjo un triage espontáneo entre los que podían caminar y los que quedaron sobre el terreno. Muchos heridos leves fueron evacuados por sus propios medios, utilizando medios de transporte públicos y fueron los primeros en presentarse en los hospitales.

Para las evacuaciones de heridos se utilizaron 300 ambulancias. Es muy importante dar prioridad a los heridos críticos y distribuir las evacuaciones según las capacidades de los hospitales, haciendo un reparto equitativo para no sobrecargar algunos e infrautilizar otros. En caso de overtriage, los servicios de urgencia hospitalarios se colapsarían con pacientes leves que consumirían recursos de personal y material, prolongando el tiempo de espera para la atención de los heridos críticos. Las evacuaciones de heridos leves se harán sobre hospitales más lejanos, incluso empleando medios de transporte colectivos.

ATENCION HOSPITALARIA

Se realizaron 1430 evacuaciones a 20 centros de atención hospitalaria de Madrid, 509 quedaron ingresados más de 24 horas. La distribución de heridos fue bastante repartida por todos los hospitales de Madrid. Esto permitió no agotar los recursos sanitarios y no demorar mucho el tratamiento de los heridos críticos. (Ver foto 4).

ACTUACION DEL HOSPITAL CENTRAL DE LA DEFENSA

El Hospital Militar Central recibió 62 heridos, de los cuales solo 51 fueron trasladados en ambulancia y
son los que se han tenido en cuenta en este estudio.
- 20 fueron dados de alta en el mismo día.
- 31 permanecían ingresados después de 24 horas. 6 de ellos en UVI (11,7%).

Los primeros heridos comenzaron a llegar al servicio de urgencias del hospital a las 8,30 h., sin embargo, los heridos con pronóstico crítico comenzaron a llegar a las 9,00 h. Es habitual que los primeros heridos en aparecer en los hospitales sean heridos leves (overtriage).

**Tipo de lesiones.**

<table>
<thead>
<tr>
<th>TIPO DE LESIÓN</th>
<th>Nº DE HERIDOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesiones de partes blandas</td>
<td>43 (83%)</td>
</tr>
<tr>
<td>Lesiones de oído</td>
<td>37 (72%)</td>
</tr>
<tr>
<td>Lesiones esqueléticas</td>
<td>20 (39%)</td>
</tr>
<tr>
<td>Lesiones neurológicas</td>
<td>9 (17%)</td>
</tr>
<tr>
<td>Lesiones faciales</td>
<td>8 (16%)</td>
</tr>
<tr>
<td>Lesiones pulmonares</td>
<td>5 (10%)</td>
</tr>
</tbody>
</table>

Era muy frecuente la asociación de diferentes lesiones en un mismo paciente. La mitad de los heridos asociaban heridas de partes blandas y lesión de oído.

En cuanto a la patología traumatológica, las lesiones mas frecuentes se produjeron a nivel torácico, las fracturas costales superaron ampliamente a las fracturas de miembros.

Las lesiones otológicas no comprometen la vida del herido y por esa razón pasan a un segundo plano, sin embargo fueron muy frecuentes (72%) debido a que los atentados tuvieron lugar en recintos cerrados. Se produjeron lesiones de blast timpánico con roturas muy amplias de la membrana timpánica, luxación de la cadena de huesecillos del oído medio e hipoacusia de
tipo mixto, perceptiva y conductiva por lesión coclear asociada. La evolución de estas lesiones fue muy tórpida debido a su complejidad. A pesar de las intervenciones de timpanoplastia, quedaron secuelas otológicas importantes en más de la mitad de los heridos.

**INDICES DE CALIDAD ASISTENCIAL**

1. Hubo una gran diferencia entre la mortalidad in situ y la mortalidad a posteriori. Se produjeron un total de 14 fallecimientos de un total de 1885 heridos. El porcentaje de mortalidad en la fase asistencial fue del 0,74%.

2. No hubo muertos entre los heridos no críticos. El índice de mortalidad entre los 96 heridos críticos (Critical Mortality Rate) fue de 14,4%.

3. La llegada a los hospitales de un alto número de pacientes con blast torácico (80% de los heridos críticos lo sufrían), que es una patología grave y con alto porcentaje de muertes, indica que la fase de evacuación funcionó bien y la baja tasa de muertes entre los heridos que la sufrían (2%), indica que la calidad asistencial en el medio hospitalario fue buena.

**LECCIONES APRENDIDAS**

1. **En la guerra, no es la medicina lo que salva mas vidas, sino la organización.** (Pirogoff). Es muy importante hacer ejercicios de simulacro de catástrofes para entrenamiento y coordinación del personal sanitario. En Madrid, se realiza un simulacro anual a gran escala con participación de todos los elementos de la cadena asistencial. Indudablemente, la preparación rinde frutos. El personal debe ser experto en técnicas simples, no numerosas pero eficaces. Las estructuras sanitarias desplegables deben ser fundamentalmente móviles y sencillas, fáciles de utilizar y que no consuman en exceso ni tiempo ni recursos. Los planes de trabajo han de ser simples, muy conocidos y repasados, los gruoses tratados no son útiles.

2. Las comunicaciones.- La telefonía móvil quedó bloqueada en Madrid. Afortunadamente, el Centro de Control dispone de una red de comunicaciones autónoma. Hubo grandes dificultades para obtener información médica y de filiación que llegaban a los hospitales. El personal debe haber aprendido a realizar su función a pesar de la ausencia de comunicaciones.

3. En los puntos de impacto se producía un fenómeno de colaboración a todos los niveles: personas que quería ayudar, unos eran profesionales y otros no, llegada masiva de ambulancias, policía, bomberos... Todos son útiles si coordinan sus esfuerzos, pero se estorban mutuamente si no lo hacen. Es muy importante que todos vayan identificados con uniformes o petos, y que cada cual asuma su tarea y no se inmiscuya en otro terreno: en la zona de salvamento: policía y bomberos, en la zona de socorro: personal sanitario. Los vehículos haciendo una noria unidireccional sin crear atascos.

4. **Triage y evacuación.**- Cuanto mejor sea el triade, mejor serán aprovechados los recursos. Los heridos graves serán los que tengan preferencia para la evacuación en ambulancia. Los heridos leves pueden ser evacuados por sus propios medios, incluso utilizar medios de transporte colectivo. No obstante, es frecuente el overtriage, y en las primeras oleadas de heridos que llegan a los hospitales, son mayoritariamente leves. En cuanto a la distribución, cuanta mayor dispersión, mejor aprovechamiento de todos los recursos hospitalarios y se reducen los tiempos de espera de atención a críticos.

**BIBLIOGRAFÍA**


ON THE ANALYSIS AND POSSIBLE PREVENTION OF SYMPTOMS RELATED TO VIRTUAL REALITY EXPOSURE.*

by M. LUCERTINI©, M. CASAGRANDE©, E. TOMAO© and E. VELARDI©

Italy.

INTRODUCTION

In a recent report from our laboratory(1), we had the opportunity to investigate several characteristics related to a flight simulator environment, including a possible pharmacological prevention of symptoms related to Simulator Sickness (SS).

Historically, SS is a relatively new chapter of aviation medicine and was considered from the beginning as a new and particular form of Motion Sickness (MS), although early studies already evidenced some differential aspects that were identified as SS specific. These aspects were mainly related to visual symptoms, as those associated with eyestrain(2), or to disorientation disorders(3, 4).

Due to the objective technical difficulty, the high instrumental costs and to the effort needed for the use of physiological tests aiming at identifying the complex and various symptoms and signs specifically due to SS, this was mainly investigated via questionnaires that...

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1985 Graduated from School of Medicine at the University of Florence (cum laude).
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1992 post graduated from the School of Audiology at the University of Rome (cum laude).
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Author/co-author of 49 scientific publications on ENT and Military Medicine periodicals (from Italy, Europe, USA).
Author/co-author of 70 oral presentations/posters at Italian and International Conferences.

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ARTICLES

RESUME

A PROPOS DE L’ANALYSE ET DE LA PRÉVENTION DE POSSIBLES SYMPTÔMES RELIÉS À L’EXPOSITION À DES RÉALITÉS VIRTUELLES.

L’exposition à différentes situations virtuelles de réalité, comme dans le cas des simulateurs de vol, peut induire plusieurs effets secondaires qui sont habituellement appelés syndrome des simulateurs (SS). En raison de ses effets négatifs sur l’apprentissage et la formation, et de la présence possible de répercussions (motrices et sensorielles), le syndrome des simulateurs peut jouer un rôle significatif quand des activités de formation sont projetées. Pour analyser les signes et les symptômes liés au SS, un questionnaire de maladie de simulateur de Pensacola (SSQ) a été développé dans les années ’80, et reste toujours une des meilleures méthodes pour analyser les conséquences cliniques des expositions aux simulateurs de vol. D’ailleurs, le SSQ peut également être adopté pour évaluer l’efficacité des outils préventifs, visant à réduire la maladie de simulateur. Dans une étude de notre laboratoire, nous avons analysé des données de SSQ chez des sujets subissant une formation standard de désorientation spatiale au sol à l’intérieur d’un simulateur de vol. Pendant chaque jour d’expérimentation, tous les sujets ont été soumis plusieurs fois au SSQ pour suivre le déclenchement et/ou la durée hypothétique des symptômes de maladie de simulateur. En outre, les symptômes de somnolence ont été évalués. Les résultats ont montré une augmentation forte des SS après la simulation de vol qui a diminué linéairement, montrant des scores de pré-simulateur après 1.30 heure. Par conséquent, le SSQ s’est montré également efficace pour la surveillance des SS, même pendant une période prolongée (12 heures). En conclusion, en raison de quelques limitations observées pendant notre étude, spécifique-ment liée à la forme courante de SSQ, on peut certainement proposer une amélioration de cet essai.

Keywords: Motion sickness, Questionnaire, Simulator sickness, Aircrews, Virtual reality.

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* Italian Air Force - Medical Corp
© ‘Sapienza’ – University of Rome

* Presented at the 37th World Congress on Military Medicine, Tunis, Tunisia, 20-25 May 2007.
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in many cases were developed from those previously adopted for MS syndromes. The Pensacola Simulator Sickness Questionnaire (SSQ), which is derived from the Pensacola Motion Sickness Questionnaire (MSQ)\(^5,\)\(^6\) is probably the most widely used result of this type of approach, and is currently adopted on a large scale as the selected method to analyse SS\(^7\).

Moreover, it shows a good level of sensitivity for the various SS aspects, and adequately matches the need of easy and cheap clinical tools to manage this relatively new syndrome. On the other hand, other data reported on other diagnostic tools, as those aiming at analysing equilibrium disorders, indicate a globally low capability to detect other early SS symptoms\(^1,\)\(^8\).

Nevertheless, our daily experience also evidenced some limitations related to the current version of the SSQ test, strictly related to its intrinsic characteristics. This aspect was observed in the standard clinical application of SSQ, as in its use during experimental protocols.

Therefore, aim of this study was the analysis, according to the data from our laboratory at the Italian Air Force (ITAF) Aerospace Medicine Department in Pratica di Mare AF (Pomezia - Rome), of the global SSQ characteristics and limitations, and of the possible identification of hypothetical solutions to be proposed in order to ameliorate the performance of a test battery to be administered to subjects undergoing the exposure to virtual reality environments.

**SUBJECTS AND METHODS**

The data reported in this study are those related to our findings with SSQ testing before and after the exposure to the flight simulator which is currently adopted at the ITAF Aerospace Medicine Department for training aircrews to prevent, avoid and counteract spatial disorientation in flight.

The motion characteristics of this flight simulator (DISO Airfox of AMST Systemtechnik GmbH Company (Ranshofen – Austria) are indicated in table I. Motion cues to the subject seated inside the simulator are generated by a six-degree-of-freedom platform, which consists of a hydraulic hexapod, with an additional electric engine for generating a 360° yaw rotation on both directions. The visual « out of the window » field is approximately 40° (horizontal) x 30° (vertical).

Each subject (twelve males aged 30-42 years) was tested before and after the exposure to simulator rides for the follow up purposes of this study, which were related to a detailed analysis of SS and drowsiness symptoms. Questionnaires were fulfilled by each subject eleven times, according to the following timetable: 8.00-9.30-11.00-12.30-13.00 (only SSQ) - 13.30 (only SSQ) -14.00-15.30-17.00-18.30-20.00. The exercises in the flight simulator were performed between the 11.00 and the 12.30 data recording times.

For the analysis of SS we adopted the standard SSQ testing, which is based on a symptom list to sixteen items, which are rated by the subject on a 4-point scale (0=absent, 1=slight, 2=moderate, 3=severe). Based on factor analysis, showing symptoms loading on three factors, three subscale scores - Nausea (general discomfort, increased salivation, sweating, nausea, difficulty concentrating, stomach awareness, and burping); Oculomotor (general discomfort, fatigue, headache, eyestrain, difficulty focusing, difficulty concentrating, and blurred vision); and Disorientation (difficulty focusing, nausea, fullness of head, blurred vision, dizzy-eyes open, dizzy-eyes closed, and vertigo), as well as a Total Sickness Scale (TSS) score, are evaluated.

For the analysis of drowsiness we adopted the Visual Analogue Scale for Sleepiness Symptoms (VAS.SS)\(^9\).

<table>
<thead>
<tr>
<th>TYPE OF MOTION</th>
<th>DISPLACEMENT</th>
<th>VELOCITY (PER SEC.)</th>
<th>ACCELERATION (PER SEC.(^2))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch (deg.)</td>
<td>± 30</td>
<td>± 20</td>
<td>± 150</td>
</tr>
<tr>
<td>Roll (deg.)</td>
<td>± 30</td>
<td>± 20</td>
<td>± 150</td>
</tr>
<tr>
<td>Yaw (deg.)</td>
<td>± 60</td>
<td>± 20</td>
<td>± 150</td>
</tr>
<tr>
<td>Add. Yaw (cont.)</td>
<td>360°</td>
<td>150°</td>
<td>± 15°</td>
</tr>
<tr>
<td>Heave (mt.)</td>
<td>± 0.14</td>
<td>± 0.4</td>
<td>± 8</td>
</tr>
<tr>
<td>Surge (mt.)</td>
<td>± 0.32/- 0.27</td>
<td>± 0.4</td>
<td>± 8</td>
</tr>
<tr>
<td>Sway (mt.)</td>
<td>± 28</td>
<td>± 0.4</td>
<td>± 8</td>
</tr>
</tbody>
</table>

**Table I :** Motion parameters of the flight simulator adopted in this study.
eyes, difficulty to maintain open eyes, yawns, motor difficulties, strong sleepiness, the feeling of dizziness, difficulty to direct one’s attention, brief and involuntary microsleeps. For each symptom, each subject made a stroke with a pen on a 100 mm long line. The stroke had to correspond to the point indicating the intensity of the self-evaluation. Each line was anchored at the left end with “not at all” and at the right one with “very much”. The distance of the mark from the left end (not at all) of the line was considered as a dependent variable. The VAS.SS represent a modified version of the Accumulated Time with Sleepiness Scale (ATS)(10). In contrast with the ATS, the VAS.SS requires subjects: 1) to assess sleepiness symptoms using VAS instead of 5-point scales; 2) to consider 10 symptoms, seven of which correspond to those evaluated in the ATS.

Beside the analysis performed with a prolonged follow up of 12 individuals, 102 additional subjects aged between 17 and 23 years (86 males and 16 females) underwent a different examination aiming at evaluating a better diagnostic performance of SSQ.

In this case the sole SSQ was evaluated, although in two different versions: the standard one, with a 0-3 scale criteria to evaluate each symptom, and a VAS one, where the subject had to stroke with a pen the 100 mm line, according to the same criteria mentioned above for the VAS.SS test. Aim of this investigation, was the analysis of possible benefits in the SSQ sensitivity, when administered in this last version

For SS evaluation, Nausea (N), Oculomotor (O), Disorientation (D), as well as a Total Sickness Scale (TSS) scoring were considered. To compute the scale scores, each symptom variable value was multiplied by the appropriate weight, and the weighted values were summed down the column to obtain the weighted total, using the following conversion formulas: N= (Σ N scores) x 9.54; O= (Σ O scores) x 7.58; D= (Σ D scores) x 13.92; TSS= (Σ total scores) x 3.74(7).

A one-way Analysis of Variance (ANOVA) was adopted to compare the data obtained in the different time intervals. The Duncan test was used for post hoc analysis of the means.

RESULTS

Figure 1 shows the time of day effects on each SSQ scale. A clear increase of SSQ (F_{11,110}= 3.36; p<0.001) scores can be observed following exposure to flight simulation, with a similar behaviour of the three different sub-scales (N, O and D). No statistically significant differences were observed among their parameters. ANOVA always showed highly significant variations for the time of day parameter, specially in the recordings obtained immediately before and after the simulator ride, where Duncan post hoc analysis revealed values ranging from p<0.0004 (N scale) to p<0.000001 (TSS).

Figure 2 indicates the time of day variation of the VAS.SS test (F_{8,88}= 2.64; p< 0.01). A globally similar behaviour can be detected with respect to the previous figure, specially if the TSS is considered. Nevertheless, a steep increase of the VAS.SS score can be observed during the last recording (time 20.00). Such a change resulted statistically significant at the ANOVA, and was not observed in the concurrent SSQ recording.

Figure 1: Time of day effects on each scale (N, O, D) and on Total sickness Scale (TSS).
In this test, the ANOVA revealed no main significant effects for the following sleepiness symptoms: to have tired eyes, difficulty to direct one's eyes, motor difficulties, to feel dizzy, difficulty to direct one's attention, brief and involuntary microsleeps. On the other hand, ANOVA revealed a main effect for difficulty to maintain open eyes ($F_{2,22} = 3.56; p < 0.04$).

**Times of day effects** were also significant for either to have heavy eyelids ($F_{8,88} = 2.81; p < 0.01$), yawns ($F_{8,88} = 2.43; p < 0.02$), sleepiness ($F_{8,88} = 2.89; p < 0.01$), and global sleepiness symptoms ($F_{8,88} = 2.64; p < 0.01$). Post hoc analysis indicated higher scores in the after simulator evaluation (12.30) until 17.00 for all of the three sleepiness symptoms ($p < 0.01$) and until the last session for heavy eyelids. Global sleepiness symptoms were higher in the after simulator evaluation compared to all the other times ($p < 0.01$) except to the last recording time and they were also higher at both 14.00 and 20.00 as respect to the other evaluations at the following times: 8.00, 9.00, 11.00, 15.30, 17.00, 18.30 ($p < 0.05$).

Finally, the preliminary investigation on the two methods adopted to record SSQ responses produced similar results, although with a smoother distribution of the responses when the VAS criterion was used.

**DISCUSSION**

The SSQ is currently considered the most validated method to analyze the consequences of exposure to flight simulators. Due to the characteristics of SS syndrome, such a questionnaire was derived from the MSQ, adding some further items related to new signs and symptoms that can be experienced within that specific environment.

Globally, symptoms are categorized according to three different scales, which are focused on the analysis of three specific aspects of sensory and motor derangements involved by SS.

Beside the N scale, which overlaps those parameters already investigated by the older MSQ, two further clusters of signs/symptoms have been developed. These focus on symptoms related to the visual (O) and orientation (D) systems, which resulted as well impaired during and after the exposure to those flight simulator rides that were initially adopted to evaluate the main clinical aspects of this syndrome. All these findings globally met the initial need of detecting and classifying the onset of SS symptoms on the part of aircrews undergoing simulator training. Moreover, the SSQ testing resulted also adequate in monitoring the symptoms behavior during a prolonged follow up. To our knowledge, this test still plays a major role in the investigation of possible side effects related to the exposure to flight simulators.

Nevertheless, some limitations in the sole use of the SSQ can also be observed during studies performed on SS, so that several other clinical tests (e.g. stabilometric platforms) were adopted in the past beside SSQ(9).

Technically, an easy improvement of the current SSQ testing, which could add higher levels of sensitivity, could be the introduction of a different scale to evaluate the questionnaire responses. The method proposed by Casagrande et al. for sleepiness symptoms matches these needs(9), and adopts a continuous analogical scale vs. the traditional four point one of the SSQ.

Such a method was preliminary evaluated in our laboratory on 102 young aircrews of both sexes, undergoing the standard aerophysiological training for spatial disorientation inside our flight simulator, according to the flight profiles previously described. As expec-
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ted, these preliminary data resulted globally similar to those obtained with the standard original rating criteria, although a more continuous variation trend among subjects can be observed. Such a finding indicates that this new method to evaluate SSQ responses does not alter the global test outcome. Moreover, the possibility of a more detailed analysis within each subject, with concurrent possible sensitivity increase, and global amelioration of the test effectiveness, can be proposed. Nevertheless, a more detailed approach to this aspect must be performed before definitely replacing the current standard score criterion.

Beside this technical improvement in the approach aiming at evaluating SS parameters, in this case maintaining the same main SSQ characteristics, other aspects related to the onset of symptoms after flight simulator rides can be proposed. These are mainly related to the evaluation of sleepiness parameters, which are a potentially major treat in flight safety for those aircrews undergoing real flight activity following simulator training.

Such an aspect was already evaluated in the past within the more general motion sickness context\[11\]. In that case, the “sopite syndrome” was proposed as a summary of symptoms related to drowsiness and demotivation. This new diagnostic possibility aimed at a better evaluation of a specific cardinal symptom related to the exposure to real-motion- or virtually-motion-environments.

Therefore, beside those symptoms that mainly characterize the analysis performed via the SSQ, the possible onset of other symptoms related to SS can progressively play a more significant role.

To our opinion, the current version of the SSQ does not give sufficient information on drowsiness, and this implies the need of other approaches to specifically analyze this aspect as well.

If we compare the results shown in figure 1 (SSQ data) with those reported in figure 2 (VAS SS data), a globally common trend of SS related symptoms can be detected. Nevertheless, some important differences can also be observed, specially if the analysis is prolonged for some hours following the exposure to our simulator environment. In these findings, although limited to a small sample of twelve subjects, the VAS SS behavior evidenced an increased mean score during the last recording (time of day: 20.00). Such a finding is not in agreement with previous data\[9,12-13\], indicating that within a normal population not exposed to the effects of a virtual reality environment, a drowsiness increase is usually observed at about 21.00 time, when subjective measure of sleepiness are used. Therefore, an mean anticipation of the normal circadian sleepiness increase was detected in our study, possibly due to some delayed effects of SS. On the contrary, a complete absence of increased symptoms, as detected by the SSQ, can be observed within the same individuals at the same time of the day (cfr. figure 1). Of course, this preliminary data needs further investigation, due to the low number of subjects examined in our study and to the wide inter-subject variability of sleepiness data in the normal population.

However, due to the lack of sufficient information on drowsiness on the part of the current standard SSQ testing, which was confirmed in this study by the discrepancy existing between SSQ and VAS SS data at the time 20.00 recording, a complementary analysis on sleepiness symptoms should be proposed in the evaluation of symptoms provoked by flight simulators.

At the present time, the technical improvement in flight simulator manufacturing is progressively developing highly realistic scenarios aiming at ameliorating the training effectiveness. Nevertheless, the effects of simulator realism and fidelity on training effectiveness are poorly understood or unknown, while there is strong reason to suspect that increased realism may result in an increase in the incidence of simulator sickness\[14\]. Such a conclusion indicates that there is still a lot of research to be performed for reducing the impact of SS as a possible side effect of simulator rides, with all the related negative consequences on flight safety.

ABSTRACT

The exposure to different virtual reality situations, as in the case of flight simulators, can induce several side effects which are usually pointed out as Simulator Sickness (SS) syndrome. Due to its negative effects on learning and training, and to the possible presence of after-effects (both motor and sensory), SS can play a significant role when simulator training activities are planned. To analyze signs and symptoms related to SS, the Pensacola Simulator Sickness Questionnaire (SSQ) was developed in the eighties, and this is still a valuable method to analyse the clinical consequences of flight simulator exposures. Moreover, the SSQ can also be adopted to evaluate the effectiveness of preventive tools, aiming at reducing SS. In a study from our laboratory, we analysed SSQ data in subjects undergoing a standard ground based spatial disorientation training inside a flight simulator. During each experimental day, all subjects filled in the SSQ several times to follow up the hypothetical onset and/or duration of SS. In addition, also sleepiness symptoms were evaluated. Results indicated a strong increase of sickness after flight simulation that linearly decreased, showing pre-simulator scores after 1.30 hours. Therefore, the SSQ resulted also effective in monitoring SS, even during a prolonged period of data analysis (12 hrs). Finally, due to some limitations observed during our study, specifically related to the current form of SSQ, an improvement of this test can certainly be proposed.
Acknowledgements
The Authors wish to thank the technical personnel from the ITAF Aerospace Medicine Dept. (WO Gregorio Angelino, WO Paolo Carrozzo, WO Fabio Pirri and WO Roberto Vitalone) that was involved in conducting this study.

References
INTRODUCTION

One of the important constraints to the use of effective Medicare by clientele especially in developing countries is cost. A cheap Medicare is almost always imbibed by the patients. The low cost if combined with simple method of use, availability and proven effectiveness optimizes preference by the healthcare provider.

Cases of wound dressing with honey are presented. The types of the wounds range from burns to ulcer. Honey a natural product of the insect bees is available and relatively cheaper than other dressing materials. It is effective if unadulterated. Honey use for wound dressing is an appropriate medicament that can address inability of patients to access effective medicament due to cost.

AIM

The aim of this paper is to highlight the effect of dressing wound with honey.

SCOPE

The scope of this presentation will cover the following:

- Case Presentation.
- Discussion.
- Conclusion.

CASE ONE

Cpl AO was a 27 years old soldier of 2 Division Nigerian Army (2 Div NA) Workshop Ibadan Nigeria.

He presented with laceration on his left foot following road traffic accident (RTA) he sustained within the 2 Div NA cantonment.

The patient was examined and an impression of deep laceration dorsum of left foot made with no clinical evidence of fracture.

He was admitted and managed with prophylactic tetanus toxoid, intravenous (i.v.) fluid, analgesic and ampiclox antibiotics. The wound was cleansed with saline and sutured.
The wound was septic when inspected on the 4th day post repair. The wound was opened, debrided and dressing with honey was commenced. Honey was topically applied to the wound which was then covered with sterile gauze. The wound healed well by 6th day of commencement with honey dressing with mild scarification.

CASE TWO
Master CS was a 14 years old student of command day secondary school, Fajuyi cantonment, Nigerian Army Ibadan. He is a son of a civilian. He presented in our hospital with burns of the upper limbs, following RTA involving two cars. There was no loss of consciousness.

On examination, he was conscious but restless. He was not pale, anicteric, acyanotic but mildly dehydrated. He had burns wound on the left upper limb from the hand to the posterolateral aspect of the shoulder. Pulse was 98/min full and regular. Heart sounds 1 & 2 were heard. Chest was clinically clear. All other systems were normal.

The patient was admitted and managed with intramuscular tetanus toxoid, antibiotics, analgesic, i.v. fluid and Vitamin C tablets. The wound was cleaned with normal saline and dress with honey. The child was nursed under a bed cradle and mosquito net.

The patient gradually got better and physiotherapy was commenced on the 3rd day of admission.

The wound healed well with minimal scar tissue. The boy was discharged after spending 14 days on admission. He was subsequently reviewed and no contracture was noticed at the burn site.

CASE THREE
Cpl MG was a 45 years old soldier of 244 tank battalion located in Shaki, Oyo state, Nigeria. He was referred to 2 Div Hospital, Ibadan, Nigeria with history of inability to walk, cough and swelling at the back of 6 months duration.

He was examined and an impression of tuberculosis of the spine (Potts disease) was made. He was admitted for further management.

Lab test performed on him showed only significant raised ESR – 96 mm/hour and wedge collapse of L4-L5 lumboSacral spine were noticed in the X ray of the spine. Mantoux test was significantly high 20 mm, but there was no acid fast bacilli (AFB) identified from the sputum after 6 consecutive specimens were examined.

Patient was commenced on anti TB drugs using the directly observed treatment short course (DOTS) regime and physiotherapy. He continued to make gradual improvement but was still unable to walk.

He developed pressure sore (decubitus ulcer) on his buttock when he was 21 days on admission, which was dressed with honey successfully. The ulcer healed within 14 days. Patient was discharged after spending 9 months in the hospital.

CASE FOUR
Sgt AO was a 42 years old soldier from Base Ordinance Depot, Ibadan, Nigeria. He presented with severe burns of his chest, abdomen, and anterior right thigh, post kerosene explosion fire incident at his residence. There was no loss of consciousness.

On examination, he was conscious, not pale, anicteric, acyanotic, but mildly dehydrated. Pulse was 60/min regular, with good volume. The chest was clear. There were 2nd burns on the chest wall, anterior abdomen and anterior right thigh.

Patient was admitted and treated with IV fluids, IV antibiotics and tetanus toxoid. The wound was cleaned with saline and dressed with honey. Physiotherapy was commenced on the 3rd day of admission.

Patient was discharged after spending 20 days on admission with good wound healing and mild scar. There was no contracture.

DISCUSSION
Honey is a natural product of bees of the genera Apis and Meliponinae. The bees collect nectar from flowering vegetation. The nectar is subjected to enzymatic processing in vivo in both the collecting bees and in a processing bee inside the hive. The processing bee then deposit nectar into a wax cell in the hive where due to relative warmth and fanning by bees, the water content is reduced by evaporation to 17%.

The sugars in the nectar are converted enzymatically into glucose and fructose. Glucose oxidase then converts the glucose into glucoronic acid and hydrogen peroxide.

Honey is acidic with low pH of 3.4 and hygroscopic osmotic effect. It is documented to contain ‘inhibines’ a previously described thermolabile bactericidal substance that Efem in 1993 considered to be hydrogen peroxide(1). However, the true nature of ‘inhibines’ is yet to be established as there is no universal agreement that it is hydrogen peroxide.

Honey had been recognized for medicinal properties since antiquity. It was mentioned for healing purposes in the Bible (Pro 24:13). It was also mentioned by Hippocrates (460-377 BC) and Democritus (460-370 BC) in ancient Greece. Hippocrates greatest Physician of antiquity is regarded as father of medicine. Democritus was a Greek Philosopher.
There were many reports in the medical literature of honey being very effective as a dressing for wounds, burns and skin ulcers. Swelling, pain and malodour were quickly reduced. Shedding of dead tissue was induced so that surgical removal was unnecessary and healing occurred rapidly with minimal scarring. Honey is not harmful to tissues but rather speeds up the growth of new tissues to heal the wound.

The antimicrobial effects of honey were variably ascribed to the pH, the hydrogen peroxide content, the osmotic effect, and « inhibines ». However, various researchers had neutralized the hydrogen peroxide with catalase in vitro with varying results.

The antimicrobial effect of honey is very useful for the bee’s purposes as honey can feed a hive through a long winter, and likewise has a shelf life of many years for human consumption.

There were many reports from workers on use of honey in the treatment of various wounds and infections.

Efem in 1988 published from his works on anti microbial and healing effects of honey, that wound heal rapidly with separation of eschar, diminished oedema, and rapid re-epithelization(1).

Efem in 1993 published his experience of managing fournier’s gangrene with honey and concluded that honey is superior to standard therapy and that it may revolutionize the treatment of this disease(2).

Hejase et al. reported on a series of 38 patients with fournier’s gangrene who had surgical debridement and systemic antibiotics followed by topical application of unprocessed honey on gauze three times a day with one death in the series. They provided neither data for the effects of honey nor controls in the series, but presented the cases as a series. They credited honey with local cleansing and improved healing of the wound(3).

Armon in 1980, reported on the use of locally produced honey for treatment of infected wounds. The treatment described was application of a thin layer of ‘pure honey’ three times a day followed by dry dressing. He stated that the wound was suitable for surgical repair on the 9th day(4).

Armon also stated a case of infected laparotomy wound post hysterectomy that was not responding to several courses of antibiotics and partial opening of the wound. He removed the sutures to allow for drainage and treated the wound with honey. He reported that the wound was granulating by the 10th day and healed by the 14th day without antibiotics(4).

Vandi et al. 1998, reported on creation of a standard protocol in their unit, where patient who had failed conventional wound treatment of 14 days IV antibiotics and wound cleansing with chlorhexidine solution and fusidic acid ointment were commenced on honey therapy. They stated that all wounds closed by day 21 of the twice daily application of fresh unprocessed honey(5).

Willix et al. 1992, reported on the antibacterial activity of Manuka honey from New Zealand as compared to other honeys(6). They proposed that an unidentified factor in Manuka honey was responsible for antibacterial effect because they use procedure that controlled for the osmotic effects of honey and the effect of hydrogen peroxide by adding catalase to the honey(6).

Cooper et al. in 1999 compared Manuka and non-Manuka honey against Staph aureus isolate from clinical wound infections at various dilutions and with the addition of catalase to inactivate hydrogen peroxide. They wrote that the non-Manuka honey at 25% v/v dilution, in the presence of catalase had no detectable antibacterial activity, whereas the Manuka honey under this condition had no loss of antibacterial activity in the presence of catalase(7).

The authors noted also that the lowest concentration of sugar that has antibacterial activity against staph aureus was 29% v/v whereas the mean inhibitory concentration (MIC) values for Manuka honey 2.3% v/v and non-Manuka honey 3.4% v/v were well below the concentration that osmolality could be credited with the antibacterial activity of honey(7).

Efem 1992 addressed the question of the osmotic effect of honey by testing in vitro the antibacterial effect of honey and the effect of sugar syrup with physical property similar to honey. He reported that osmotic effect of honey was not responsible for its activity parse because the control sugar syrup was ineffective against any of the organisms tested(8).

Wahdan et al. 1998 also discovered that honey was statistically significantly more bactericidal that sugar syrup with the same sugar content as honey. At dilute concentration, the honey was always more bactericidal and bacteriostatic. This also affirms that the antibacterial activity of honey is not due to its osmotic effect alone(9).

Subrahnxanyam 1991 compared Manuka and non-Manuka honey against Staph aureus isolate from clinical wound infections at various dilutions and with the addition of catalase to inactivate hydrogen peroxide. They wrote that the non-Manuka honey at 25% v/v dilution, in the presence of catalase had no detectable antibacterial activity, whereas the Manuka honey under this condition had no loss of antibacterial activity in the presence of catalase(7).

Obaseki et al. 1984 working on the anti-candida effects of a distillate of honey, reported that many isolate of candida were susceptible to the HY-1 factor of the distillate(10).

Oluwatosin et al. 2000 compared topical honey and phenytoin in the treatment of chronic leg ulcer. They noted that their study suggested phenytoin had a superior effect(12).
From the presented Literature Review, there were ample evidences of the usefulness of dressing of wound with honey. Also, it was shown that more work need to be done to identify the actual factor in honey responsible for its healing properties. The osmotic effects and hydrogen peroxide production had been shown by many workers not to be the exclusive properties that enhance wound healing in honey\(^2, 6, 7\).

The topical application of honey to wounds and covering with sterile gauze as shown in the cases presented from our unit, appear to be a universally accepted method\(^2, 5, 8\). There was no report of contracture from our series as the scars formed were very minimal.

The honey used in treating the cases presented was from Kogi State, Nigeria. It is a known source of «pure» unadulterated honey from bee keepers. Adulterated honey is freely available and popular. Honey like substance from sugarcane processing is sold as honey to the ignorant mind.

Adulteration which is a serious challenge was addressed by regular supply of honey from known authentic sources.

The cost of honey used to treat our patients was between N500 to N1000 (Nigerian Naira) which was about 4 to 8 US dollars. This is usually cheaper than the cost of conventional dressing materials. Insects are usually attracted by honey and all our patients were protected by bed cradle under mosquito nets.

Most of the patients can apply the honey themselves, after the initial period of management. This is very beneficial to us as it helps to address our man power shortage.

Wounds are routinely managed with honey in our hospital.

**CONCLUSION**

The proving efficacy of honey in wound healing is very encouraging and a welcome feat. ‘Pure’ honey is available and relatively cheap. The mode of application to wound is simple that all cadres of health providers including patients themselves can apply it.

Patients in developing countries like Nigeria are benefiting from this honey potential has they can easily access it. Most of the other medicaments are imported to the country leading to the high cost to end users, who might be unable to afford them. The challenges of adulterated honey are addressed by sourcing from known authentic bee keepers scattered all over the country.

Honey is an appropriate medicament in this country. It is a regular material in our hospital wound management protocol.

**SUMMARY**

Different forms of wound presentation were common occurrence in the Out Patient Department (OPD) of 2 Division Hospital Nigerian Army, Ibadan Nigeria.

Four patients with wounds are presented. The types/causes of the wounds include burns, ulcer and abrasion; all the patients are males with age range of 14 to 45 years.

All the wounds were dressed with bee honey with satisfactory results. There were minimal scar formation in our series but no contracture deformity was recorded.

The challenges encountered during the management and some measures put in place to address them were highlighted.

Honey is a very handy and suitable wound dressing material because of its availability and cost effectiveness. It is an attractive wound-dressing agent in countries with growing/developing economies.

Honey is an appropriate medicament in Nigeria. It is a regular material in our hospital wound management protocol.

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Melbourne, Australia. 15th February 2008 – In a landmark study electronically published today in the *American Journal of Respiratory and Critical Care Medicine*, a blood test for detecting TB infection, QuantiFERON®-TB Gold (QFT®), has been shown to be six times more accurate than the conventional tuberculin skin test (TST) at predicting which tuberculosis (TB)-exposed individuals will go on to develop TB disease. This study has important implications for the worldwide effort to eradicate TB, as accurately indentifying TB-infected individuals allows health authorities to treat them before they develop disease, and the greater accuracy of the new test makes this more efficient as well as cheaper and safer. Globally, up to two billion people are infected with TB. In most cases the TB bacteria is contained by the body’s immune system (latent TB infection) without any symptoms of the infection. But 9 million people, most originating from this large pool of individuals with latent TB infection, are reported every year by The World Health Organization as developing active and infectious TB disease. In the developed world, TB eradication strategies have focused on identifying and treating people with latent TB infection. Until recently the tuberculin skin test (TST; Mantoux test) has been the only test available to detect infected people. However, the TST often produces false-positive results, meaning many uninfected people are offered unneeded preventative treatment for TB. This treatment is for 6 to 9 months and may produce damaging side effects. For improved TB control, a test that accurately detects those truly infected, enabling treatment for only those at risk of developing TB disease, has major implications. The QFT test has now been shown to have this desired characteristic. In the German city of Hamburg, Dr. Roland DIEL and colleagues used both TST and QFT on 601 people who may have been infected by contact with people with TB disease. 40% had a positive TST, but only 11% (66) of the exposed persons were found infected by QFT and offered TB treatment – 41 declined. Over the next two years 6 people developed TB disease, all were QFT positive and had declined treatment. In the past, all 243 TST positive people would need to have had anti-TB treatment to prevent only 5 of these cases, as one was TST negative. In scientific terms, QFT had a predictive value for developing TB disease of 15%, more than 6 times greater than the 2.3% for the TST. What does this mean? Using QFT, doctors can now treat only a fraction of the people they would have with the TST, with the knowledge that they are preventing TB disease to at least the same extent, and likely better. Dr. Lee B. REICHMAN, Professor of Medicine and Preventive Medicine and Community Health and Executive Director of the New Jersey Medical School Global Tuberculosis Institute in Newark, New Jersey USA comments: « For many years we have known that active TB is a preventable disease, but we have had an extremely difficult time convincing health professionals and patients to apply and accept well recognized preventive measures because the tuberculin skin test, universally used to define risk wasn’t selective enough. This study by DIEL and colleagues is really "dynamite" because, for the first time, it documents that by using QFT in place of the skin test, practitioners can focus on a much smaller group who are those most likely to progress to active TB ». These findings have far-reaching economic implications for global and regional TB control, as use of QFT in similar settings will likely result in only one quarter the number of individuals requiring preventative medication as indicated by the current, inaccurate, TST. The adoption of QFT will enable health authorities to confidently focus on individuals who are truly at risk of developing active TB, significantly reducing the costs and risks associated with preventative treatment, and effectively reducing the overall number of cases of tuberculosis disease. For example, in the Hamburg study alone, by using QFT instead of the TST, >45,000 fewer pills would have been needed to treat every test positive person. Worldwide, this can eliminate the cost and side-effects of taking tens of billions of unnecessary tablets, and many millions of X-rays and clinical visits.

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http://ajrccm.atsjournals.org/cgi/content/abstract/200711-1613OCv1
INTRODUCTION

Prostate cancer is the sixth most common cancer in the world (in the number of new cases), the third most common in men, and the most common cancer in men in Europe, North America, and some part of Africa.

Inerleukin-6 (IL-6) is a 21 to 28 kDa pleiotropic cytokine produced by macrophages, lymphocytes (B and T), and T cells. It is involved in the regulation of the immune response, inflammation, and differentiation of cells. IL-6 is produced by various cells, including macrophages, lymphocytes, and fibroblasts. It plays a role in the development of cancer, particularly in prostate cancer. IL-6 is also involved in the progression of prostate cancer and can stimulate the growth of cancer cells.
fibroblast and endothelial cells. It has a variety effects on hematopoiesis, immune and inflammatory responses. In addition to an immunological function, IL-6 has a role also in regulation of proliferation, apoptosis, angiogenesis and differentiation. It is implicated in the development and progression of many tumours that of prostate.

The prostate specific antigen, PSA, is an androgen regulated serine protease and member of tissue kallikrein of proteases. It is produced by prostatic epithelial cells and is a very valuable protein marker in human blood for the diagnosis of prostate cancer. Production of PSA in prostate tissue is positively regulated by the androgen receptor AR. The physiological function of PSA is the hydrolysis of seminal vesicle protease inhibitors (soybean trypsin inhibitor and 1 μM phenylmethyl sulphonic fluoride, 0.01 mg/ml of leupeptin) which present a low affinity complex with the cytokine and the signal-transducing subunit, gp130. Binding IL-6 to its receptors leads to activation of the Jak/STAT pathway.

The prostate specific antigen, PSA, is an androgen regulated serine protease and member of tissue kallikrein of proteases. It is produced by prostatic epithelial cells and is a very valuable protein marker in human blood for the diagnosis of prostate cancer.

In patients with widely-elevated Total PSA (range approximately 4-20 ng/ml), the discrimination of prostate cancer from benign prostatic hyperplasia was difficult. Therefore, the measurement of free PSA/Total PSA ratio in serum has been demonstrated to significantly improve this discrimination between two prostatic pathologies.

Production of PSA in prostate tissue is positively regulated by the androgen receptor AR. The physiological function of PSA is the hydrolysis of seminal vesicle proteins, seminogelin I and II and fibrinonectin.

Signaling pathways activated by IL-6 have been shown to activate the AR and androgen responsive genes such as PSA in a ligand-independent manner.

The aim of this study was to investigate the expression of IL-6 and its receptors in tunisian prostatic biopsies by western blot and immunohistochemical and to evaluate the relation between Total sera PSA levels from these patients according IL-6 expressions.

**MATERIAL AND METHODS**

Prostates were obtained from:

(a) transurethral resections from 25 men (aged from 55 to 85 years) diagnosed clinically and histopathologically with Beginn Prostatic Hyperplasia BPH;

(b) radical prostatectomies from 17 men (aged from 57 to 88 years) diagnosed with Prostate Cancer PC, type adenocarcinomatous and

(c) histologically normal prostates obtained at autopsy (8-10 hours after death) from 5 men (aged from 20 to 38 years) without histories or reproductive, endocrine or related diseases.

Each diagnosed sample was divided into two portions; one portion was immediately processed for immunohistochemistry, and the other portion was frozen in liquid nitrogen and maintained at -80°C for Western Blotting analysis. This study was made with the consent of the patients' relatives or their family in autopsy cases. All the procedures followed were examined and approved by the Military Hospital of Tunis (HMPIT) and Hospital of Fatouma Bourguiba of Monastir (Tunisia).

**SERA PSA ANALYSIS**

PSA DPC Immulite assays (gifts of Diagnostics Products Corporation, Los Angeles, CA) were use to determine Total serum PSA levels from these patients before the radical prostatectomy. These assays were performed according to the manufacturer’s instructions. It’s an immunoassay type sandwich, double site and in solid phase, using the monoclonal and polyclonal antibodies anti-PSA. The reaction was developed with an enhanced chemiluminescence’s.

The primary antibodies used were: rabbit anti-human IL-6, rabbit anti-human IL-6Rα and rabbit anti-human Gp130 (Santa Cruz Biotechnology, Ca, USA).

**WESTERN BLOT ANALYSIS**

Tissues were homogenized in the extraction buffer (0.005 M Tris-HCl, pH 8) with addition of a cocktail of protease inhibitors (10 mM iodoacetamide, 100 mM phenylmethyl sulphonic fluoride, 0.01 mg/ml of soybean trypsin inhibitor and 1 μl/ml of leupeptin) and phosphates inhibitors (10 mM sodium fluoride and 1 mM sodium orthovanadate) in the presence of 0.5% Triton X-100. After centrifugation, the protein concentration of supernatants was calculated by the Bradford method. Then, supernatants were equilibrated with loading buffer (10% SDS in Tris/HCl pH 8 containing 50% glycerol, 0.1 mM 2-beta-mercaptoethanol and 0.1% bromphenol blue) at 50 μg/ml and denatured for 5 min at 100°C. The aliquots (10 μl of homogenate) were separated in SDS-polyacrylamide slab minigels (15% gels). Separated proteins were stained with Coomassie blue and visualized by UV transilluminator.

**RESULT**

The primary aim of this study was to investigate the expression of IL-6 and its receptors in tunisian prostatic biopsies by western blot and immunohistochemical and to evaluate the relation between Total sera PSA levels from these patients according IL-6 expressions. Each diagnosed sample was divided into two portions; one portion was immediately processed for immunohistochemistry, and the other portion was frozen in liquid nitrogen and maintained at -80°C for Western Blotting analysis. This study was made with the consent of the patients’ relatives or their family in autopsy cases. All the procedures followed were examined and approved by the Military Hospital of Tunis (HMPIT) and Hospital of Fatouma Bourguiba of Monastir (Tunisia).
transferred in the transfer buffer (25 mM Tris-HCl, 192 mM glycine, 0.1% SDS and 20% methanol). Nitrocellulose membranes (0.2 μm) were blocked for 1 hour with 1% donkey serum in TBS, and incubated overnight at room temperature with the primary antibodies at 1:200 (IL-6, IL-6Rα) and 1:250 (Gp130) in TBS with 5% bovine serum albumine (BSA). After extensive washing with TBS/Tween-20 (TBST), the membranes were incubated with swine anti-rabbit (IL-6, IL-6Rα, and Gp130) biotinylated immunoglobulins (Dako, Barcelona, Spain) for 1 h at 1:4000 dilution in TBS with 5% BSA; and then washed and incubated with the avidin-biotin-peroxidase complex (Vector Laboratories, Burlingame, CA) at 1:10000 dilution. After an intensive wash, the filters were developed with an enhanced chemiluminescence (ECL) kit, following the procedure described by the manufacturer (Amersham, Buckinghamshire, UK).

**IMMUNOHISTOCHEMISTRY ANALYSIS**

Tissues were fixed for 24 h at room temperature in 0.1 M phosphate-buffered 10% formaldehyde, dehydrated and embedded in paraffin. Sections (5-μm thick) were processed following the avidin-biotin-peroxidase complex (ABC) method. Following deparaffinization, sections were hydrated, incubated for 30 min in 0.3% H2O2 diluted in methanol to reduce endogenous activity. To retrieve the antigen, the sections were incubated with 0.1 M citrate buffer (pH 6) for 2 min in a conventional pressure cooker. After rinsing in TBS buffer, the slides were incubated with normal donkey serum at 3% in TBS for 30 min to prevent non-specific binding of the first antibody. Thereafter, the primary antibodies were applied at a dilution of 1/50 (IL-6 and IL-6Rα) and 1:200 (Gp-130) in TBS at room temperature overnight. Afterwards, the sections were washed twice in TBS and then incubated with swine anti-rabbit (IL-6, IL-6Rα, and Gp130) biotinylated immunoglobulin (Dako, Barcelona, Spain) at 1:500 in TBS. After 1 hour of incubation with secondary antibody, the sections were incubated with a standard streptavidin-biotin-complex (Vector Laboratories, Burlingame, CA, USA) at 1:500 and developed with 3, 3’-diaminobenzidine (DAB), using the glucose oxidase-DAB-nickel intensification method.

For negative controls of immunoreactions, tissues of each type were incubated with pre immune serum at the same immunoglobulin concentration used for each antibody or with blocking peptides (Santa Cruz Biotechnology). As positive controls, histological sections (immunohistochemistry) of thymus (IL-6, IL-6Rα and Gp130) were incubated with the same antibodies.

A comparative histologic quantification of immunolabeling among the different types of prostates was performed for each antibody. Of each prostate, six histological sections were selected at random. In each section, the staining intensity (optic density) per unit surface area was measured with an automatic image analyzer (Motic Images Advanced version 3.2, Motic China Group Co., China) in 5 light microscopic fields per section, using the X40 objective. From the average values obtained (by the automatic image analyzer) for each prostate, the means ± SD for each prostatic type (normal prostate, BPH and PC) were calculated. The same results were obtained by two different observers. The number of sections examined was determined by successive approaches to obtain the minimum number required to reach the lowest SD. The statistical significance between means of the different prostate samples was assessed by the Fisher exact and the one-way ANOVA test at p≤0.05 (GraphPad PRISMA 3.0 computer program).

**RESULTS**

**WESTERN BLOT ANALYSIS**

For each antibody used, a single band at their corresponding molecular weight was found in NP, BPH and PC: IL-6 (21 kDa), IL-6Rα (80 kDa) and Gp130 (130 kDa) (Figure 1). NP samples showed a thin band to IL-6, IL-6Rα and Gp130 compared with bands found in BPH and PC samples.

**IMMUNOHISTOCHEMISTRY ANALYSIS**

No immunoreaction was observed in negative controls incubated with pre-immune serum, or using the antibodies preabsorbed with an excess of purified antigens. Staining of thymus sections (positive controls) was always positive for all antibodies used.

For each antibody assayed, the percentages of positive cases are shown in Table 1.

In normal prostate, all the patients’ samples were positive to IL-6. In BPH (Figure 2A) and PC (Figure 2B) patients, immunoreactions to IL-6 were positive (respectively 68% and 76.5%). Immunostaining to IL-6

![Figure 1](image-url)
was weak in normal prostate (4.83±2.65), whereas in BPH and PC samples, this reaction was more intense respectively 23.47±4.65 and 26.2±3.19.

Immunoreaction to IL-6Rα was found in 60% of normal prostates (Table 1). Positive immunoreaction of epithelial cells to IL-6Rα was observed in 84% of BPH (Figure 2C) and 94.1% of PC (Figure 2D). The highest optic density was found in PC samples (32.76±4.23) which is statistically different than BPH (23.34±3.14) and NP (12.34±2.02).

All NP patients’ samples were positives to Gp130. In BPH, the epithelial cells showed nuclear immunoreactions in 44% of patients (Figure 2E). Cytoplasmic immunoreactions of epithelial cells were observed in 82.3% of PC patients (Figure 2F). In PC samples, the optic density is higher than (40.46±5.42) found in NP and BPH respectively (1.1±0.18 and 13.26±2.87).

**Sera Total PSA analysis according IL-6 family.**

The measurement of sera Total PSA levels for each pathology showed patient’s repartition among PSA cut-off. The most BPH patients (15/25) presented sera Total PSA levels between 4-20 ng/ml. For PC patients, the majority (13/17) presented sera Total PSA levels >20 ng/ml. (Table 2)

To establish a relation between sera Total PSA levels for each prostatic pathology and immunoexpression of

<table>
<thead>
<tr>
<th>PATHOLOGY</th>
<th>IL-6 %</th>
<th>O.D.</th>
<th>IL-6Rα %</th>
<th>O.D</th>
<th>GP130 %</th>
<th>O.D</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP (5)</td>
<td>5 (100%)</td>
<td>4.83±2.65</td>
<td>3 (60%)</td>
<td>12.34±2.02</td>
<td>5 (100%)</td>
<td>1.12±0.18</td>
</tr>
<tr>
<td>BPH (25)</td>
<td>17 (68%)</td>
<td>23.47±4.65</td>
<td>21 (84%)</td>
<td>23.34±3.14</td>
<td>11 (44%)</td>
<td>13.26±2.87</td>
</tr>
<tr>
<td>PC (17)</td>
<td>13 (76.5%)</td>
<td>26.2±3.19</td>
<td>16 (94.1%)</td>
<td>32.76±4.23</td>
<td>14 (82.3%)</td>
<td>40.46±5.42</td>
</tr>
</tbody>
</table>

**Table 1 :** Percentage of patients showing positive immunohistochemical reactions to IL-6 family members in Normal Prostate (NP), Benign Prostatic Hyperplasia (BPH) and Prostate Cancer (PC). BPH and PC groups were subdivided according to PSA levels : 0-4 ng/ml, 4-20 ng/ml and >20 ng/ml.

<table>
<thead>
<tr>
<th>PSA LEVELS NG/ML</th>
<th>IL-6 %</th>
<th>IL-6Rα %</th>
<th>GP130 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP &lt;4</td>
<td>5 (100%)</td>
<td>3 (60%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>BPH</td>
<td>17 (68%)</td>
<td>21 (84%)</td>
<td>11 (44%)</td>
</tr>
<tr>
<td>PC</td>
<td>13 (76.5%)</td>
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<td>14 (82.3%)</td>
</tr>
</tbody>
</table>

**Table 2 :** Percentage of patients showing positive immunohistochemical reactions to IL-6 family members in Normal Prostate (NP), Benign Prostatic Hyperplasia (BPH) and Prostate Cancer (PC). BPH and PC groups were subdivided according to PSA levels : 0-4 ng/ml, 4-20 ng/ml and >20 ng/ml.
Interleukin-6 (IL-6) is a pleiotropic cytokine that plays roles in hematopoiesis, immune and inflammatory responses and is produced by immunity cells, endothelial cells and epithelial cell in normal and pathologic conditions such as epithelial prostatic cells. The IL-6 receptor system consists a ligand-binding chain (IL-6R alpha) and a non ligand-binding signal transducer (Gp130). IL-6 and its receptors have been shown to regulate prostate cancer growth and to activate AR-dependent gene expression in prostate cancer cells in the absence of androgen such as prostate-specific antigen (PSA), a protease secreted by the epithelial prostate cells. The aim of this work was to study the expression of IL-6 and its receptors in relation to sera Total PSA levels in normal prostate (NP), benign prostatic hyperplasia (BPH) and prostate cancer (PC). The biopsies from 5 NP, 25 BPH and 17 PC patients were taken. IL-6, IL-6R alpha and Gp130 were analysed by immunohistochemical and Western-Blot. Sera Total PSA concentrations of the BPH and PC patients were measured by DPC IMMULITE assays.

In normal prostate, all the patients’ samples were positives to IL-6; whereas in BPH and PC patients, immunoreactions to IL-6 were more intense with respectively percentages 68 and 76.5%. Positive immunoreaction of prostatic epithelial cells to IL-6R alpha was observed in 84% of BPH and 91.4% of PC samples. Gp130 immuno-staining appeared in 44% of BPH and 82.3% of PC samples. To evaluate the relation between sera Total PSA and IL-6 and its receptors, immunoreactions to IL-6R alpha were positive in BPH and PC with Total PSA between 0-4 ng/ml, 4-20 ng/ml and >20 ng/ml and increased with the malignancy and Total sera PSA levels. Immunoreactions to Gp130 decreased in BPH samples with increased Total sera PSA levels.

IL-6 and its receptors in prostate tissues showed a regulatory role in cancer progression and indirectly on sera Total PSA levels. This role seems to show another face of pro-inflammatory cytokines in carcinogenesis.

References
Genzyme Diagnostics, Medix Biotech subsidiary has received FDA clearance to market its Contrast® hCG rapid test with a sensitivity of 10 mIU/mL hCG for serum samples and 20 mIU/mL for urine samples. The test features Genzyme’s patented Contrast® technology which facilitates the interpretation of test results by presenting distinct black lines against a white background.

Contrast® hCG is a rapid immunoassay intended for the qualitative detection of human chorionic gonadotropin (hCG) in urine or serum. It is intended for in vitro diagnostic use by professionals. After performing a simple one step test procedure, results can be read in 1-4 minutes for urine and 1-5 minutes for serum. With an extended read time of 7 minutes, hCG levels of 10 mIU/mL can be detected in serum specimens.

Contrast® hCG tests may be purchased in bulk quantities for OEM customers or in 30 test kits for distribution. The tests have a shelf life of 24 months and may be stored conveniently at room temperature (2-30°C or 36-86°F).

Genzyme Diagnostics also offers a Contrast® Strep A rapid test for qualitative detection of Group A Streptococcal antigen from throat swabs. Rapid tests for infectious mononucleosis and other analytes are currently in development.

Genzyme Diagnostics, Medix Biotech subsidiary
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CONVERSIÓN DE FIJACIÓN EXTERNA DE FRACTURAS.

per Juan José LASA⁹.
Uruguay.

Juan José LASA

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Orthopedic Department - British Hospital Montevideo on April 1, 1989.
Orthopedic Department - Evangelic Hospital Montevideo on September 19, 1991.

DAAD - Grant Berufsgenossenschaftliche Unfallklinik Frankfurt/ Main in 1984.
Multinational Force & Observers - Medical Officer - MFO # 2548 - Sinai in 1988.
German Federal Army Hospital - Federal Defence Ministry - Ulm in 1994.

National Delegate to the ICMM in 1996.
International Course on Developing and Organizing a Trauma System - Haifa in 2001.


ICMM – Congresses contributions:
MILITARY USE OF THE MODULAR AO EXTERNAL FIXATOR ISTANBUL IN 1993.
EARLY EXTERNAL FIXATION OF MULTIPLE FRACTURES IN POLYTRAUMA PATIENTS AUGSBURG IN 1994.
EXTERNAL FIXATOR COMPATIBILITY IN SEVERE WOUNDS TREATMENT BEIJING IN 1996.
SHORT STUMP TREATMENT AFTER BLOW INJURY VIENNA IN 1998.
SURGICAL PREPAREDNESS FOR WAR HELSINKI IN 2000.
SECOND PROCEDURE AFTER EXTERNAL FIXATION OF FRACTURES IN WASHINGTON 2004.

SUMMARY

CONVERSION OF EXTERNAL FIXATION OF FRACTURES.

Our country participates in Multinational Peace-keeping Forces, with military and civilian personnel, since 1935 (Chaco War).

As for any task force in today’s battlefield, an efficient casualty evacuation system is essential in reducing the preventable disabilities or deaths among wounded personnel.

Peacekeeping Missions casualties sustained similar wounds to that produced during modern battle: Landmine, ambush, terrorist attack, motor vehicle crash.

The First Level at which peacekeeping forces casualties receive care is a Field or Civilian Hospital overseas, where according to the limbs wounds type, burn and crush injuries or polytrauma, External Fixation of fractures is the surgical treatment of choice.

« More with Less » ➞ External Fixator.

In the event their wounds require extensive treatment, or convalescence, casualties are evacuated to the Military Hospital in our capital city Montevideo.

These patients applied an algorithm at its Trauma Service, slightly different to regular ones, due to usually delayed evacuation time from the Mission Area.

The selection for these second surgical procedures after External Fixation of fractures - nailing or internal fixators - precises their indications.

Keywords: Peacekeeping, Injuries, External fixation.

Uruguay participa en Fuerzas Multinacionales desde 1935, luego de la Guerra del Chaco. (Fig. 1).

Durante el desarrollo de su Misión, el personal civil y militar que presta servicio bajo órdenes de la Organización de las Naciones Unidas o Tratados Internacionales Especiales, se ve expuesto a riesgos similares a los que se enfrenta el combatiente en un moderno Teatro de Operaciones:
- emboscadas, explosiones por minas antitank or antipersonales,
- heridas por arma de fuego, atentados terroristas o accidentes de vehículos motorizados.
Las lesiones comprometen las extremidades; en general son bajas politraumatizadas, que sufren amputaciones, lesiones por estallido, lesiones por aplastamiento, quemaduras o fracturas expuestas, en cerca del 35% del total de las heridas(1).

Estando desplegados en territorio de la misión, son atendidos en las diferentes estaciones de la Cadena de Evacuación Sanitaria, que pueden ser Hospitales de Campaña o Puestos Quirúrgicos Móviles instalados en carpas o contenedores por los Contingentes participantes, a veces a Hospitales Locales o Regionales donde reciben los Primeros Auxilios, y seguidamente transportados por Evacuación Aeromédica a los Hospitales de Tercer Nivel de las ciudades importantes más cercanas o con acceso asegurado.

Por último, el escalón final de evacuación para los integrantes del Contingente Uruguay es siempre nuestro Hospital Militar en Montevideo. (Fig. 2).

En el Servicio de Traumatología son recibidos los pacientes tratados con Fijadores Externos en aplicación del concepto que los identifica "More with less" para aquellas lesiones que los científicos franceses definen con las tres "B": brulés, blastés, blessés.

Se utilizan modelos diferentes de fijadores externos, de acuerdo al equipamiento de la fuerza encargada de realizar el apoyo sanitario en el Contingente desplegado para la Misión: modulares tipo Hoffman y AO, monofijadores tipo Orthofix y Unifix, anillados tipo Ilizarov o híbridos tipo AO de acero o de barras de carbono, y muchos más.

En nuestro Hospital, utilizamos el fijador externo tubular AO, que consta de pocos elementos, gran versatilidad, pues el mismo montaje se utiliza en prácticamente todos los huesos largos o grandes articulaciones y con la gran ventaja de poseer la capacidad de corregir la reducción obtenida con otros fijadores externos, sin cambiar los clavos ya colocados en los fragmentos óseos(2).

El fijador externo modular tubular AO, se inicia con la colocación de dos clavos de Schanz en cada fragmento fracturario; se fijan esos dos clavos de Schanz a un tubo corto con dos rótulas clavo-tubo para cada fragmento, conformando "mangos" que permiten alinear la fractura. Se completa el montaje con un tercer tubo corto unido a los módulos con rótulas tubo-tubo. (Fig. 3).

Esta secuencia se ilustra como A - B - C. (Fig. 3). Si no se obtiene la reducción deseada, se aflojan las dos rótulas tubo-tubo, se corregirá el foco y se vuelven a apretar.

Este sistema simple, versátil, universal, fue desarrollado a partir del diseño de las rótulas tubo-tubo en Montevideo(3), y lo utilizamos en nuestro hospital desde hace más de veinte años(4).

La fijación externa de las fracturas es un procedimiento que se utiliza en la Emergencia, pero una vez que se estabiliza al paciente, y resuelto el riesgo vital inmediato, se plantea la conversión a otros procedimientos de fijación interna: clavos endomedulares u osteosíntesis con placas.

Este segundo procedimiento quirúrgico está indicado para mejorar la comodidad del paciente y para evitar...
que la larga permanencia de los fijadores externos pro-
voque complicaciones sobre todo en la interfase clavo-
hueso y el inevitable conflicto clavo - piel.

En el caso particular de los pacientes que cumple fun-
ciones como integrantes de las Fuerzas Multi-nacio-
nales, son transferidos frecuentemente con demora desde
las diferentes regiones.

A los portadores de fijación externa de sus lesiones se les aplica en nuestro Servicio un protocolo para la
segunda operación, con la utilización en las fracturas dia-
quisarías de los grandes huesos largos, del clavo endo-
medular sólido bloqueado bipolar y para las metáfisis epi-
quisarías, la nueva generación de implantes que cumplen
con el concepto de Fijador Interno desarrollado por AO.

Con la aplicación de esta técnica se procura disminuir
el número de osteosíntesis infectadas, y sus compli-
caciones más frecuentes con retardo de consolida-
ción, pseudoartrosis y rotura del implante.

Para analizar los resultados del tratamiento de fractu-
ras de la diáfisis del fémur, con el clavo femoral sólido
UFN (Unreamed Femoral Nail) de AO, se invita a leer un trabajo sobre 83 casos, de los que el 30% son
conversiones de fijación externa.

Se publicó en el nuevo formato de OSF (Open Source
Format), con todos los casos documentados con radi-
ografías pre y postoperatoria y documentos radiológi-
cos alejados, de los 83 casos a los que se refiere el tra-
bajo, sin perder ningún seguimiento⁵.

Es una nueva metodología de publicación de trabajos
científicos que agrega todas las imágenes en un disco
compacto (CD) para analizar todas las imágenes por
parte del lector. (Fig. 4).

FIJACIÓN INTERNA
CON PLACAS BLOQUEADAS

El nuevo concepto de fijador interno supone una fija-
ción con placas y los tornillos no solamente hacen
presión en el hueso sino que se bloquean también en la
propia placa; puede ser por un sistema prototipo de
cabeza cónica, como el PC- Fix (Point Contact Fixator)
que es para pequeños fragmentos; puede ser el LCP
(Locked Compression Plate) que tiene un orificio en
forma de 8 con un canal de rosca y un canal liso que
permite utilizar tornillos comunes de osteosíntesis o
utilizar los pernos de bloqueo con cabeza roscada
cónica; puede ser el LISS (Less Invasive Stabilization
System), que tiene una rosca cónica que bloquea la
cabeza del tornillo con la placa. (Fig. 5).

Este bloqueo transforma al concepto de placa convencio-
cional en un Fijador Interno donde no hay movimiento
entre el tornillo y la placa, otorgando solidez adicio-
nal en la presa del implante al hueso⁶.
En el siguiente ejemplo, se observa un implante LISS que se utilizó en la conversión del fijador externo en puente de rodilla de una fractura de epífisis proximal de tibia y el control intraoperatorio tomado del intensificador de imágenes. (Fig. 7 a-b-c.).

La técnica operatoria del Fijador Interno utiliza abordajes quirúrgicos pequeños con aplicación de procedimientos MIPO (Minimal Invasive Percutaneus Osteosinthesis) para evitar amplias exposiciones que elevan el riesgo de contaminación y devitalización.

El estudio de todo el material científico acumulado, con la aplicación de este protocolo de Conversión de Fijación Externa de las Fracturas, nos alienta en su aplicación y se ofrecerá en próximas presentaciones.

CONCLUSIONES

Un protocolo apropiado y una correcta selección de los implantes mejora el desempeño del Cirujano de Trauma, perfeccionando su curva de aprendizaje y acelerando su preparación para enfrentar situaciones de desastre.

Muchas veces debemos utilizar como centros de referencia y evacuación un Hospital Quirúrgico Móvil o un Barco Hospital donde sus características imponen una adecuada administración de los recursos, seleccionando en forma precisa aquello que integrará el apoyo logístico al Servicio Sanitario, sobre todo en el área quirúrgica traumatólogica.

BIBLIOGRAFÍA

**INTRODUCTION**

L’homocystéine (Hcy) est un acide aminé soufré provenant de la transméthylation de la méthionine, acide aminé nécessaire au métabolisme des protéines\(^1\). Des concentrations élevées en Hcy ou hyperhomocystéinémie peuvent être dues à certains facteurs nutritionnels tels que carences en vitamines B12, B6 et/ou folates qui sont des cofacteurs des réactions du métabolisme de l’Hcy\(^2,3\); des facteurs génétiques comme les mutations survenant au niveau des enzymes du métabolisme de l’Hcy dont la plus impliquée est la mutation C677T du gène de la MTHFR\(^4,5\); ou encore les facteurs liés au style de vie (tabac, alcool,...), tains médicaments (méthotrexate, carbamazépine…) ou certaines pathologies (psoriasis, diabète, hypothyroïdie…)\(^6,7,8\).

Cette hyperhomocystéinémie est de plus en plus considérée comme facteur de risque indépendant pour les maladies cardiovasculaires\(^9,10\).

Par ailleurs, la Lp (a) est une lipoprotéine proche des LDL; elle s’en distingue par une apolipoprotéine particulière : l’apolipoprotéine a\(^11\). L’un des mécanismes potentiels expliquant la relation entre la Lp (a) et les maladies cardiovasculaires, est son homologie avec le plasminogène\(^12\).

Dans notre étude nous visons à déterminer une relation entre ces deux paramètres et certains facteurs de risque des maladies cardiovasculaires chez un groupe de sujets sains.

**MATÉRIEL ET MÉTHODES**

**MATÉRIEL**

Cette étude a porté sur 566 sujets de sexe masculin apparemment sains. Ils ont été prélevés après un jeûne de 12 heures. Au laboratoire, les échantillons ont été centrifugés à 3000 tr/min pendant 15 minutes. Le sérum aliquoté a été conservé à -20 °C jusqu’à dosage. Une enquête clinique a été suivie pour chaque sujet. Les renseignements clinico-physiques (âge, BMI, tabac alcool…) et biologiques (bilan lipidique, Hcy, Lp (a)) ont été recueillis.

**MÉTHODES**

Pour l’analyse de l’Hcy, la méthode immuno-chimiluminescente a été utilisée. Pour l’apolo A et B, une méthode immunonéphélométrique a été employée. Les paramètres lipidiques (cholestérol total, HDLc, triglycérides) ont été mesurés par méthodes colorimétriques enzymatiques.

**RÉSULTATS**

L’étude a porté sur 566 sujets de sexe masculin apparemment sains. Les concentrations d’Hcy moyenne était de 14,24 ± 8,80 μmol/l. La relation de Hcy à l’âge, ApoA et ApoB a été significativement corrigé (r=0,003; p<0,01) mais pas à Lp (a). La relation significative entre Hcy et Lp (a) a été trouvée uniquement pour les sujets ayant des concentrations d’Hcy ≥15 μmol/l (r=0,045; p<0,05).

**DISCUSSION**

La relation significative entre Hcy et Lp (a) à haute concentration d’Hcy peut être due à l’augmentation de la concentration de Lp (a) en cas de concentrations élevées d’Hcy. Cette augmentation de la Lp (a) peut donc augmenter le risque de maladies cardiovasculaires, même si ces deux paramètres sont considérés indépendants.

**Mots-clés :** Hyperhomocystéinémie, Lp (a), Facteurs de risque cardiovasculaires, Sujets sains.
VitB12, folates) ont été prescrits sur une fiche de recueil de données. Cette population a été subdivisée en sous-groupes en fonction de l’alcoolisme (n=91) et du tabagisme (n=363).

**TECHNIQUES DE DOSAGE**

Le bilan lipidique comporte le dosage du cholestérol total, des triglycérides et du HDLc par méthode colorimétrique enzymatique sur l’automate RA1000 de la firme Bayer Diagnostic, les concentrations sont exprimées en mmol/l et le LDLc a été calculée selon la formule de Friedwald pour des concentrations de TG < 4.5 mmol/l (LDLc= CholT- (HDLc + (TG/2.2))). Le dosage de la Lp (α), de l’ApoA et de l’ApoB a été effectué par néphélométrie et les concentrations exprimées en g/l; l’Hcy a été dosée par immunochimiluminescence sur l’Immulite de la firme Diagnostic Product Corporation (DPC). C’est un immunodosage par compétition utilisant un marqueur luminescent et nécessitant une étape manuelle de prétraitement qui consiste en la séparation de l’Hcy des protéines de liaison. Les concentrations de l’Hcy sont exprimées en μmol/l. La VitB12 et les folates ont été dosées par le même principe sur l’Immulite 2000. La VitB12 exprimée en pg/ml et les folates en ng/ml.

**ANALYSE STATISTIQUE**

L’analyse statistique a été réalisée par logiciel SPSS 10.0 de Windows. Les résultats sont exprimés en Moyenne ± Ecart type. Le test de student pour échantillons indépendants a été utilisé pour la comparaison des variables continues entre groupes. La comparaison des variables discontinues entre groupes a été effectuée par le test U de Mann-Whitney. La corrélation entre les paramètres a été déterminée par le test Rho de Spearman. Les variables sont considérées significativement différentes pour des valeurs de p< 0.05.

**RÉSULTATS**

Les principales caractéristiques démographiques et cliniques de la population d’étude sont représentées par le tableau I.

<table>
<thead>
<tr>
<th></th>
<th>N=566 SUJETS SAINS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ÂGE (ANS)</td>
<td>26.97 ± 8.77</td>
<td></td>
</tr>
<tr>
<td>BMI (KG/m²)</td>
<td>24.41 ± 3.16</td>
<td></td>
</tr>
<tr>
<td>ALCOOLISME (%)</td>
<td>64.2</td>
<td></td>
</tr>
<tr>
<td>TABAGISME (%)</td>
<td>16.1</td>
<td></td>
</tr>
</tbody>
</table>

Le groupe de l’étude est formé par des sujets de sexe masculin dont l’âge varie de 19 à 71 ans avec 61.30% âgés moins de 25 ans.

Dans le tableau II, figure les caractéristiques biologiques déterminées chez les sujets alcooliques et tabagiques ainsi que la population totale.

Dans la population totale (n=566), l’Hcy moyenne est de 14.24 ± 8.80 μmol/l, la prévalence des sujets ayant une hyperhomocystéinémie (Hcy ≥15 μmol/l) est de 28.62%.

L’Hcy est trouvée corrélée à l’âge (p=0.003), à la VitB12 (p=0.008), à l’ApoA (p=0.011) et à l’ApoB (p=0.04). Nous avons noté une corrélation significative entre l’âge et le CholT, le HDLc, le LDLc, l’ApoA et l’ApoB.

Toutefois cette corrélation n’est pas statistiquement significative avec la Lp (α). La Lp (α) n’est corrélée qu’au Chol T, au LDLc (p< 0.01) et à l’ApoB (p<0.05).

Si on compare le groupe des alcooliques à celui des non alcooliques, on remarque une différence significative au niveau des TG, de l’Hcy, des folates et de la VitB12. En effet, les alcooliques ont des concentrations de Chol plus faibles que les non alcooliques (12.34 ± 8.57 μmol/l contre 14.59 ± 8.81 μmol/l; p= 0.05) (Figure 1), de même pour les folates (3.77 ± 1.27 ng/ml contre 4.27 ± 1.79 ng/ml; p=0.019). La concentration de la VitB12 est significativement plus élevée chez les alcooliques (289.23 ± 115.61 pg/ml contre 253.85 ± 105.91 pg/ml; p=0.008).
Responsible
Accurate
Efficient

Today’s soldier deserves to be protected against tuberculosis disease. Reliable infection screening makes that possible.

QuantiFERON®-TB Gold.
The new blood test for TB infection.
En comparant le groupe des tabagiques à celui des non tabagiques, on a trouvé une différence significative au niveau de l’Hcy, des folates, de l’ApoB, du LDLc, du Chol T et de la BMI. Les concentrations de l’Hcy sont plus élevées chez les non tabagiques, mais on n’a pas trouvé de corrélation avec la Lp (a) (Figure 2).

La corrélation entre l’Hcy et la Lp (a), est trouvée significative pour les sujets ayant des concentrations d’Hcy ≥15 μmol/l (r=0.045 ; p< 0.05).

Dans ce groupe l’Hcy était trouvée corrélée aussi aux folates (p<0.05) et à la VitB12 (p<0.01) et les deux vitamines corrèlent entre eux (p< 0.01).

Le tableau III résume les corrélations non paramétriques entre les différents paramètres dans la population totale.

DISCUSSION


Concernant le tabagisme, les tabagiques dans notre étude, ont des concentrations d’Hcy moins élevées que les non tabagiques contrairement à ce qui a été trouvé dans certaines études qui trouvent une corrélation positive entre le tabac et l’Hcy[18]. Il a été montré que les fumeurs présentaient une concentration significativement basse de phosphate de pyridoxal comparés aux non-fumeurs[19].

En ce qui concerne la Lp (a), dans notre étude la moyenne est de 0.12± 0.11 g/l; la Lp (a) est trouvée corrélée au Chol T, au LDLc et à l’ApoB, ces paramètres sont bien établis des facteurs de risque des maladies cardiovasculaires à des concentrations élevées[20]. L’ApoB est la principale composante des particules LDL, et des concentrations élevées en ApoB sont observées dans les modifications vasculaires; de ce fait ce
paramètre est recommandé un indicateur du risque en plus de la Lp (a)(21). Cette hypothèse est en accord avec les résultats de l’étude de C. Meisinger et al (22) qui montrent que l’ApoB et le rapport ApoB/ApoA sont des forts prédicteurs des événements coronaires chez des sujets de moyen âge.

Dans notre étude, la concentration en Lp (a) n’est pas affectée par la consommation d’alcool. Ces résultats sont en désaccord avec ceux de M. Valimaki qui rapporte que l’administration de l’alcool à des individus sains entraîne une diminution de la concentration en Lp (a)(23) et de K. Kervinen qui montre qu’une consommation excessive d’alcool est associée à une augmentation significative des concentrations de la Lp (a)(24). Ces observations mènent à l’hypothèse que l’effet cardioprotecteur de l’alcool peut être en partie à la diminution des concentrations de la Lp (a) sous l’action de l’alcool(25). Ces observations mènent à l’hypothèse que l’effet cardioprotecteur de l’alcool peut être en partie à la diminution des concentrations de la Lp (a) sous l’action de l’alcool(25). Ces observations mènent à l’hypothèse que l’effet cardioprotecteur de l’alcool peut être en partie à la diminution des concentrations de la Lp (a) sous l’action de l’alcool(25). Ces observations mènent à l’hypothèse que l’effet cardioprotecteur de l’alcool peut être en partie à la diminution des concentrations de la Lp (a) sous l’action de l’alcool(25). Ces observations mènent à l’hypothèse que l’effet cardioprotecteur de l’alcool peut être en partie à la diminution des concentrations de la Lp (a) sous l’action de l’alcool(25).

CONCLUSION

En conclusion de cette étude, on peut dire que l’Hcy et la Lp (a) sont des facteurs indépendants et discriminatoires du risque d’athérosclérose coronarien et que leur dosage pourrait être bénéfique dans l’interprétation des événements cardiovasculaires.

RÉSUMÉ

L’hyperhomocystéinémie est une augmentation anormale du taux de l’homocystéine (Hcy), acide aminé soufré provenant de la transméthylation de l’acide aminé essentiel : la méthionine. Plusieurs facteurs sont à l’origine de cette augmentation à savoir le statut vitamino, les facteurs génétiques et/ou encore les facteurs environnementaux. Comme la lipoprotéine a (Lp (a)),
l’Hcy est considérée un facteur de risque cardiovasculaire dans plusieurs études faites. 

Dans la présente étude nous visons à déterminer la relation entre les concentrations sériques en Hcy et la Lp (a) chez un groupe de sujets sains et d’étudier l’effet du tabac et de l’alcool sur l’Hcy et la Lp (a).

Cette étude a porté sur 566 sujets de sexe masculin avec un âge moyen de 26.97 ± 8.77 ans. Pour chaque sujet nous avons déterminé l’Hcy par immunochromiluminescence; la Lp (a), l’ApoA, et l’ApoB par néphélométrie et le Cholestérol total (CholT), les triglycérides (TG) et le cholestérol des particules HDL par méthode enzymatique colorimétrique.

La Lp (a) corrèle avec l’Hcy à des taux élevés (Hcy ≥ 15 μmol/l) (r=0.045 ; p <0.05).

La Lp (a) est considérée des facteurs de risques indépendants pour les maladies cardiovasculaires vue que les deux paramètres sont corrélés.

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INTRODUCTION

Les troubles trophiques chez le diabétique sont multifactoriels. La neuropathie, l’artériopathie et l’infection participent à cette complication redoutable. Elle expose à des complications métaboliques, à des hospitalisations répétées, et surtout à la perte de la fonctionnalité secondaire aux amputations (1). À travers l’expérience de notre service nous nous proposons de relever les particularités épidémiologiques et évolutives de cette affection redoutable.

MATÉRIELS ET MÉTHODES

Il s’agit d’une étude rétrospective menée au service de chirurgie viscérale et vasculaire de l’hôpital militaire de Rabat. Sont inclus tous les diabétiques ayant subi une amputation au niveau du membre inférieur pour troubles trophiques, entre le 1er janvier 2002 et le 31 décembre 2004. Les données épidémiologiques et évolutives sont recueillies sur une fiche standardisée.

153 patients sont répertoriés parmi les 516 diabétiques admis pendant la même période, soit 29,65%. Ils représentent 2,23% de toute l’activité du service. La prédominance est masculine (131 hommes et 22 femmes). L’âge moyen est de 53,3±9,2 ans, avec des extrêmes.

SUMMARY

Epidemiological and evolutive features of diabetic feet, in patients undergoing amputation - about 153 cases -

The aim of this study was to determine the impact of diabetic feet, on short-term mortality and morbidity in patients undergoing amputation of the lower member. A retrospective study, including patients with diabetic feet undergoing surgery, has been performed among 153 patients between 1.1.2002 and 31.12.2004, among whom 50% are amputated over the leg. The short-term mortality rich 2,6%. The length of stay to the hospital is raised (19 days).

Persons with diabetes are at greater risk for infection because of underlying neuropathy, peripheral vascular disease, and impaired responses to infecting organisms. Furthermore, untreated infection can lead to amputation. Multidisciplinary management consisting of teams of specialists with a focus on limb preservation can make significant improvements in outcomes, including a reduction in rates of lower extremity amputation.

Diabetic foot is an important risk factor for perioperative mortality and morbidity.

Mots-clés : Pied diabétique, Amputation, Infection.

RÉSULTATS

153 patients sont répertoriés parmi les 516 diabétiques admis pendant la même période, soit 29,65%. Ils représentent 2,23% de toute l’activité du service. La prédominance est masculine (131 hommes et 22 femmes). L’âge moyen est de 53,3±9,2 ans, avec des extrêmes cliniques et évolutives sont recueillies sur une fiche standardisée.

ARTICLES

CARACTÉRISTIQUES ÉPIDÉMILOGIQUES ET ÉVOLUTIVES DU PIED DIABÉTIQUE CANDIDAT À UNE AMPUTATION - À PROPOS DE 153 CAS.

par A. EL HASSOUNI, L. BELYAMANI, A. ALHYANE, S. AL KANDRY, I.M. JANATI et N. DRISSI K.

Maroc.
de 31 et de 93 ans. Le diabète est non insulinodépendant (DNID) chez 114 patients (soit 74,50%), et 39 insulinodépendants (DID) (soit 25,50%). Le diabète évoluait depuis 10,45±3,2 ans; 54 patients (35,29%) sont suivis pour au moins une complication dégénérative (rétinopathie, néphropathie, neuropathie et coronaropathie). 39 patients ont des antécédents d’amputation au niveau des membres inférieurs. La glycémie moyenne à l’admission est de 2,5±0,75 g/l, et 36 patients sont en acidocétose diabétique. À l’admission, 87 patients (56,86%) ont des troubles trophiques au stade III de Wagner, 56 patients (36,60%) au stade IV et 10 (6,53%) au stade V. L’infection des parties molles est retenue devant la présence de signes locaux : rougeur, tuméfaction, suintement. Quand ils sont atténués, l’infection est retenue devant l’augmentation de l’exsudat et l’apparition d’une douleur localisée, associées à des signes inflammatoires biologiques (hyperleucocytose, élévation de la C réactive protéine). Tous les patients avaient des signes cliniques d’infection. La preuve bactériologique n’a été apportée que chez 48 patients (31,37%). Il existe une atteinte osseuse chez 92 patients (60,13%); seuls 24% des patients avaient des signes d’ostéite sur la radiographie. L’amputation a été réalisée 19 fois sous anesthésie générale, 123 sous rachianesthésie et 11 fois sous blocs périphériques (fémoral et sciatique). Une antibiothérapie empirique à large spectre pour tous les patients à base d’amoxicilline plus acide clavulinate. L’oxygéno-thérapie hyperbare a été réalisée chez 41 patients (soit 27%). L’amputation était limitée à un ou deux orteils dans 46 cas (30,06%), à l’avant-pied dans 28 cas (18,3%), à la jambe dans 61 cas (39,86%) et 18 à la cuisse (11,76%). Le postopératoire est marqué par le déséquilibre glycémique chez 63 patients, l’insuffisance rénale aiguë (6 cas), 2 troubles du rythme dans un avec mouvement enzymatique cardiaque. Quatre décès sont notés dans les suites opératoires immédiates : par infractions du myocarde massif chez deux patients; par choc septique sur cellulite extensive dans deux autres cas. La durée d’hospitalisation moyenne a été de 19±3,4 jours (allant de 12 à 50 jours). Elle est de trois fois la durée de séjour moyenne dans le service.

**DISCUSSION**

Le pied diabétique est une cause importante d’hospitalisation, d’invalidité, de morbidité et de mortalité supplémentaire chez les diabétiques(3). La neuropathie comme l’ischémie peuvent causer des ulcères aux pieds et des blessures difficiles à soigner. L’infection de ces blessures expose à l’amputation. Ce risque est multiplié par 10 à 15 chez le diabétique(3). L’amputation n’est pas uniquement un marqueur de la maladie. C’est aussi un bon reflet de gestion de l’affection. Un taux élevé d’amputation peut traduire l’état local compliqué, un retard de la prise en charge, mais aussi une approche chirurgicale particulière. La nécessité de contrôle de l’infection et le besoin d’une réhabilitation précoces, conduit à un traitement radical d’emblée. Le traitement conservateur a le mérite de préserver la fonctionnalité du membre et d’être moins mutilant. Proposé à outrance il peut prolonger la souffrance, et augmenter la mortalité(1). Dans notre activité, le traitement conservateur n’a été proposé que dans 9% des cas. Ceci est inférieur à l’état des patients. Les stades de Wagner III et IV prédominent (>90% des cas) associés à une infection étendue des parties molles et des signes d’ostéite. Le retard de prise en charge, la sous-consécutive de notre population (moins de 18% de la population est affiliée à un organisme de couverture sociale et sanitaire) compliquent la prise en charge. Ce taux anormalement élevé d’amputation n’a permis ni la réhabilitation précoce ni la réduction de la morbi-mortalité périopératoire. La durée de séjour à l’hôpital est de 19 j. Elle représente trois fois la durée de séjour moyenne (DSM) dans le service (6 jours) et plus de deux fois celle des diabétiques (8,5 j). Dans un travail personnel (à paraître), le pied diabétique représente un facteur prédictif de gravité en périopératoire chez le diabétique. Il allonge la durée de séjour à l’hôpital (p = 0,001), augmente le nombre de complications postopératoires (p = 0,01), et le nombre d’incidents préopératoires (p = 0,008). (voir Tableau 1).

La neuropathie et plus accessoirement l’artériopathie font le lit des troubles trophiques. Une hypoxie tissulaire et des troubles de sensitivomoteurs prolongés conduisent à ce désordre appelé communément le pied diabétique(4). La cause déclenchante est un traumatisme minime insignifiant, passé inaperçu(5). Ce traumatisme mine ou évitable, a un coût exorbitant pour le patient et pour la collectivité. En plus du coût direct représenté par l’implication de l’entourage, l’indisponibilité, la perte de l’autonomie; le pied diabétique à un coût direct. En 1990, celui-ci a été estimé entre 5 000 et 8 000 dollars US ($) pour un mal perforant (stade II de Wagner), et à 15 000 $ lorsqu’il est infecté. Le traitement d’une ostéite coûte entre 25 000 $ et 30 000 $, une amputation entre 50 000 $ et 150 000$. Ces chiffres contrastent avec le coût d’une année de soin préventif qui est de 1 000 $, le prix d’une paire de chaussures compris(6). 15% des diabétiques développeront un ulcère du pied. Cette lésion s’infectede souvent(7). L’amputation du membre inférieur fait suite à une infection non contrôlée dans 50% des cas(8). Le nombre d’amputés augmente à travers le monde, malgré les campagnes d’information et la connaissance des mécanismes initiateurs(9).

Classiquement, le diagnostic de l’infection du pied diabétique repose sur trois éléments : issue de sécrétion purulente, présence de signes inflammatoires locaux (œdème, chaleur, rougeur et douleur), manifestations systémiques telles que fièvre et hyperleucocytose. En pratique, il existe des difficultés diagnostiques liées à la neuropathie et aux troubles vasomoteurs chez le diabétique. Ni la chaleur ni la rougeur ne sont constants. Aussi plus de
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• reconstruction and guidance
• process validation
• quality handbook
• description of working place
• instruction and improvement
• training on the job
• selection of cleaning and sterilisation devices
• adequate instruments
50% de pieds diabétiques ne développrent ni fièvre ni hyperleucocytose. Le manque de spécificité et de sensibilité des signes cliniques et biologiques empêche le diagnostic de l'infection à un stade précoce. L'extension vers les parties molles et vers l'os assombrit le pronostic. Dans notre série, tous les patients étaient infectés. Une antibiothérapie empirique à base d'amoxicilline + acide clavulinique est débutée dès l'admission (une quinolone en cas d'allergie). Le manque de résultats dans notre série est lié au retard de prise en charge. Les patients se présentent avec des lésions très évoluées: tous les patients avaient un pied diabétique infecté, plus de 94% d'entre eux au stade III et IV de Wagner. L'atteinte osseuse est présente dans 60% des cas.

**CONCLUSION**

Le pied diabétique n'est pas une lésion bénigne. Il complique volontiers un diabète mal équilibré. Le traumatisme initial souvent bénin est majoré par la neuropathie sous-jacente. Greffée sur ces troubles trophiques, l'infection pose des problèmes diagnostiques et thérapeutiques. Seul un traitement précoce permettrait d'améliorer le pronostic. L'intérêt de la prévention chez le pied diabétique n'est plus à rappeler. L'éducation des patients, l'auto-examen journalier des membres, et l'amélioration de l'hygiène corporelle permettent d'éviter cette affection redoutable. Ces mesures simples ont un impact sur la qualité de vie du diabétique tout en réduisant le coût global de la prise en charge pour la collectivité.

**TABLEAU 1 : Facteurs prédictifs de gravité chez le diabétique en chirurgie générale.**

<table>
<thead>
<tr>
<th>FACTEURS</th>
<th>NOMBRE</th>
<th>INCIDENT PEROPÉRATOIRE</th>
<th>COMPLICATION POSTOPÉRATOIRE</th>
<th>DURÉE DE SÉJOUR &gt; 9J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 60 ans</td>
<td>145</td>
<td>145 (p=0,000)</td>
<td>140 (p=0,005)</td>
<td>136 (p=0,01)</td>
</tr>
<tr>
<td>Sexe masc.</td>
<td>321</td>
<td>169 (p=0,09)</td>
<td>247 (p=0,238)</td>
<td>258 (p=0,212)</td>
</tr>
<tr>
<td>Type de diabète</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DID</td>
<td>141</td>
<td>61 (p=0,482)</td>
<td>83 (p=0,928)</td>
<td>139 (p=0,007)</td>
</tr>
<tr>
<td>DNID</td>
<td>375</td>
<td>147 (p=0,354)</td>
<td>132 (p=0,562)</td>
<td>341 (p=0,001)</td>
</tr>
<tr>
<td>Traitement en périopératoire</td>
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<tr>
<td>Régime</td>
<td>78</td>
<td>32 (p=0,991)</td>
<td>47 (p=0,336)</td>
<td>40 (p=0,542)</td>
</tr>
<tr>
<td>ADO</td>
<td>144</td>
<td>121 (p=0,632)</td>
<td>143 (p=0,517)</td>
<td>166 (p=0,362)</td>
</tr>
<tr>
<td>Insuline</td>
<td>294</td>
<td>79 (p=0,485)</td>
<td>99 (p=0,147)</td>
<td>140 (p=0,004)</td>
</tr>
<tr>
<td>Glycémie &gt; 1,5 g/L</td>
<td>240</td>
<td>88 (p=0,724)</td>
<td>127 (p=0,238)</td>
<td>240 (p=0,000)</td>
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<tr>
<td>Type de chirurgie</td>
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<td></td>
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<tr>
<td>Pied diabétique</td>
<td>153</td>
<td>149 (p=0,008)</td>
<td>146 (p=0,01)</td>
<td>151 (p=0,001)</td>
</tr>
<tr>
<td>Chir. majeure</td>
<td>61</td>
<td>59 (p=0,005)</td>
<td>55 (p=0,01)</td>
<td>61 (p=0,000)</td>
</tr>
<tr>
<td>Chir. mineure</td>
<td>302</td>
<td>217 (p=0,369)</td>
<td>195 (p=0,215)</td>
<td>219 (p=0,354)</td>
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<tr>
<td>Type d'anesthésie</td>
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<td>ALR</td>
<td>222</td>
<td>222 (p=0,000)</td>
<td>174 (p=0,052)</td>
<td>152 (p=0,404)</td>
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<td>AG</td>
<td>294</td>
<td>187 (p=0,587)</td>
<td>193 (p=0,471)</td>
<td>210 (p=0,193)</td>
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<tr>
<td>Degré d'urgence</td>
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</tr>
<tr>
<td>Chir. programmée</td>
<td>318</td>
<td>245 (p=0,652)</td>
<td>217 (p=0,881)</td>
<td>263 (p=0,361)</td>
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<tr>
<td>Chir. en urgence</td>
<td>198</td>
<td>115 (p=0,611)</td>
<td>198 (p=0,000)</td>
<td>198 (p=0,000)</td>
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**RÉSUMÉ**

**Objectif:** Notre objectif est d’analyser les caractéristiques épidémiologiques et évolutives des pieds diabétiques candidats à une amputation.

**Matériel et méthodes:** Il s’agit d’une étude rétrospective à l’hôpital militaire d’instruction de Rabat. Ont été inclus tous les pieds diabétiques amputés entre le 1er janvier 2002 et le 31 décembre 2004.

**Résultats:** 153 patients sont répertoriés, 131 hommes et 22 femmes. L’âge moyen est de 53,3±9,2 ans (extrêmes: 31 et 93). Le diabète insulinodépendant est prédominant à 74,45%. Le diabète évolue depuis 10,45±3,2 ans. 57,2% des patients sont au stade 3 de Wagner, et 37,2% au stade 4. L’amputation est limitée à un ou deux orteils dans 46 cas (30,06%), à l’avant-pied dans 28 cas (18,3%), à la jambe dans 61 cas (39,86%) et dans 18 cas à la cuisse (11,76%). L’oxygénothérapie hyperbare est réalisée chez 41 patients (27%). Le postopératoire est marqué par le déséquilibre glycémique dans 63 cas, l’insuffisance rénale aiguë (6 cas), 2 troubles du rythme dont un avec mouvement enzymatique cardiaque et 4 décès (2,61%). La durée d’hospitalisation moyenne a été de 19±3,4 jours (allant de 12 à 50 jours).

**Discussion:** l’amputation du membre guette le pied diabétique. Notre série révèle un taux de traitement conservateur très bas (9% des cas seulement). La mortalité dans les suites opératoires immédiates est élevée (2,61%). La durée de séjour à l’hôpital est excessivement allongée à 19 j (la durée moyenne de séjour dans le service est de 6 jours).
Conclusion : La sous-médicalisation de la population, le manque d’information du diabétique et la difficulté de prise en charge multidisciplinaire aggrave le pronostic d’une lésion, évitable dans bon nombre de cas.

Références


URSEC
Une arme simple contre les infections nosocomiales

Il est connu que les urinaires de lit habituels ont la fâcheuse propriété de répandre leur contenu (souvent chargé de micro-organismes pathogènes) au moindre geste mal-adroit dans le lit ou suite à un coup de frein en ambulance. Les urines vont alors souiller l’environnement : pyjama, literie, sols... contribuant ainsi à la dissémination des infections nosocomiales en milieu hospitalier.

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Son système anti-reflux amovible autorise un nettoyage en lave bassins et son plastique (recyclable) lui permet d’être stérilisé à l’eau de Javel ou en autoclave à 130°C.

URSEC ne pouvant répandre son contenu utile, il est une arme moderne et économique de prévention contre les infections nosocomiales. Dénué de pièces mécaniques, URSEC ne nécessite aucune maintenance à part son nettoyage et dispose d’une durée de vie de plusieurs années. URSEC évite de nombreux blanchissages et nettoyages, et fait gagner un temps précieux au personnel hospitalier. URSEC s’est vu décerner le prix Intermedica par le Ministre français de la Recherche et de la Technologie. URSEC est déjà utilisé avec succès en France et dans 14 pays.

PLUS JAMAIS ÇA...

Odeurs Micro-organismes Draps mouillés

Trop tard, les germes se répandent...

Par les « accidents » coûteux qu’il évite (urinal ordinaire renversé = draps à changer, pyjama et couverture mouillés...), URSEC engendre, au fil des mois, des économies bien supérieures à son prix d’achat et procure un confort inégalé à l’alité.

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INTRODUCTION

It is a new topic of military transformation that Chinese military medical personnel participate in the United Nations peacekeeping operation. From Dec. 2004 to July 2005, we have deployed a better-trained medical contingent in United Nations peacekeeping operations in Liberia and performed the medical support mission very well.

1. TRAINING MEDICAL PERSONNEL WITH ARMY VALUES DURING PEACEKEEPING SITUATION.

1.1 THE CHARACTERISTIC OF PSYCHOLOGY AND THE OBJECT OF TRAINING

The peacekeeping medical operation is a special non-military operation. The doctor, technical sergeant and female nurse selected from different units, which was composed of a medical detachment with 43 personnel. Their age, education background and social experience were very different and with short of well-military training, real army life and soldier character. So combat psychological training should focus on the need of peacekeeping operation, conduct enhance training in standby phrase, the adjustment at any time in the mission area and the psychological appeasement return to country in front and back, exerting influence according to the psychological activity and character characteristic of everybody and everything, to hold every personnel psychologically stable and content personnel increase operational readiness and efficiency(1).

1.2 SHAPE THE ENDURING FIGHTING DETERMINATION

The particularity of the peacekeeping makes the military medical personnel bear super psychologically pressure and the charge of physical power. It is easy to form the psychological pressure and make the enduring ability out of balance. When they throw themselves into the risks, differences even the menaces of injury and death for a long time, because living environment in the war zones is quite bad and the incidence of all kinds of epidemic disease is so high, thus they own harmful psychological condition, such as they feel nervous, own the frustrated feeling, suffer pain, they condemn themselves, and lose confidence. It may lead to the psychological barrier. When the symptom of psychology and physiology come into being, directly affect or can’t carry out the assignments, we call it of the response of combat stress(2, 3). Consequently, the focal point of the strengthen training in the recruited stage is to developed soldier value-notion, sense of honor, and sense of responsibility(4). And try hard to make the staffs who have taken part in the strengthened training form the key value-notion which embrace honor, loyalty, courage, firmness endure, tolerance and so on, on such a condition that they could own stable psychology, that they preserve fortitude and have full confidence, keep vigorous fighting determination, and have struggling spirit; maintain to perform peace keeping soldier obligation and have the ability to complete the mission.

1.3 ELEVATE THE COMPREHENSIVE ABILITY OF COMMAND

Strive for the commanders’ comprehensive ability is the core of performing and accomplishing, the peacekeeping operation. To complicated and changeful, dangerous and the accident of the uncertainty; in view of medical personnel are not familiar with the policies and the laws of medical support missions in the area of operations. In the light of the medical contingent’ arms defensibilities is weak and it’s possible to be
Make early and confident clinical decisions with PCT

Integration of Procalcitonin measurement into clinical assessment has been proven to:

• Improve early diagnosis of bacterial infection/sepsis\(^1,2\)
• Allow guidance of antibiotic therapy\(^3,4\)
• Help early detection of treatment failure\(^5\)

kidnapped and attacked from the ambush when meeting and evacuating the wounded. Therefore, after the medical contingent were send to the mission area, the psychological adjustment should be fixed upon that satisfying the multiple task demands of conduct, pay attention to commanding the contact, harmonizing with multinational forces of peacekeeping, improving the effect of medical support attaching importance to grasp personnel’s psychology and exert the influence. Enhancing troop morale, casting collective fighting will and lofty thought, pay attention to communality in the confidence of finishing tasks and stable mood at highly harmony. The medical contingent activities are the actions of some tactics level; however, they represent the position of United Nations. Every task of wounds treating and curing reveals figure of nation and army in fact. Only grasp by collecting politics, military, diplomacy, the essence of the mission of medical support, could we organize thoroughly, plan scenically, administer rigidly, and could we emerge our troops’ mental look that are can those, like, especially bear hardships, can especially fight, especially observe discipline, can especially devote.

2. INTERVENING PEACEKEEPING MEDICAL PERSONNEL’S CRISIS OF PEACEKEEPING.

2.1 BRING OUT FACTORS OF COMBAT STRESS

1. Intensity of medical support: Medical personnel psychological combat stress and executing supporting difficultly and dangerously are closely related. The longer tasks duration for peacekeeping to carry out, the higher the incidence is.

2. Environmental factors: Contact highly dangerous infectious disease for a long time; the chaos and poor state caused by war of the host country; incident of peacekeeping personnel may suffer the arms attack; disarmed personnel of the host country rioting or threatening by bombs.

3. Army’s morale: Medical contingent’s collective cohesiveness; commander’s level and believable degree; degree of attentiveness to medical personnel.

4. Personal quality: The characteristic of composition of personnel of medical element has determined differences of age of sex, physiological psychology, education and experience, has determined many styles of reaction of combat stress.

2.2 SIZE UP THE SITUATION AND PREVENT EFFECTIVELY

The first is regular psychology guiding. Fostering soldier’s quality, soldier’s consciousness, military skill, the healthy personality and team spirit. The second is to reinforce the conscientiousness of actual combat. Anticipate many kinds of complicated scenes in which changed suddenly, To the medical mission that dispatch advance-sending detachment and aero evacuate, to prompt emergency in night, to the warfare readiness investigation of U.N, keep tense situation, keep self-regulation and control mood under field operations condition and ability to meet environment of battle-field. The third is to optimize self-maintenance. Offer

3. THE ADJUSTMENT METHOD FOR THE PSYCHOLOGICAL BEHAVIOR OF MEDICAL CONTINGENT.

3.1 SELF-ADJUSTMENT OF PSYCHOLOGICAL DEFENSE

1. Psychological acknowledgement: Learn from rich experience of former medical contingent of peacekeeping, so as to meet the demand of environment of peacekeeping subjectively, and to strengthen the belief of self-fulfillment of task and duty.

2. Substitution of object: When rescuing the casualty, it is a good method for medical personnel to substitute sub-psychological reaction with others objects, so as to relieve the pressure to make self-psychological balance.

3. Psychological appeasement: Participating in the discussion about some ridiculous topics is another good method to release the psychological fatigue and the bored attribute, and to stimulate the spirit.

4. Adequate sleeping and diet: The essential step is to ensure enough sleepy time and reasonable diet, to sustain physical and psychological spirit, so as to defeat the nervous feeling when being in the mission area.

3.2 PURSUIT OF PROMOTING THE COLLECTIVITY SPIRIT

Strengthen the corporate faith education by culture and sport activities. Several of activities have put the meditation adjusting and the mind curing into the entertainment, which are prone to accept and handle. The joviality gotten from the activities blows away the bad emotion, plays important part of summoning up spirit, inspiring sentiment, promoting sleep and furthering appetite, and it deepens the friendship and understanding of each other between the teammates, which accomplishes the mind adjusting and curing in the harmony silently. The culture and sport activities have annotated the realizing of the lives and the understanding of the peace, expressed the pursuit of the ideal and the love of their country, and improved the political and idealistic diathesis, the humanism culture and the health level of the teammates. Magnificent spirit pursuit makes people confront and rein themselves by affirmative attitude, adds courage to confront the extremely bad environment, even disremember themselves. The promotion of the will-power, the confidence, the endurance of frustration and ability of controlling themselves, is beneficial to improve the obedient consciousness and the collectivity spirit. High morale and united power can prevent the happen of combat mind hyperirritability and the mutual infection of the mass panic psychology effectively.
3.3 REASONABLE CATHARSIS NEGATIVE EMOTION

We should correctly cognizant and sufficiently comprehend every team member’s negative emotion. In order to alleviate or eliminate psychological pressure, we pay attention to correctly guiding individuals to adopt reasonable manner to confide and express depressive emotions. Patiently listen attentively to or comprehend team member as much as one likes confide and badness emotion, make team member in ignorance to obtain sympathy or comfort or canvass and assistance, to effectively appease outrage, to alleviate affliction, to dispel anxiety. For those because of various reason inconvenience reveal psychology that directly express to others inspire team member using the e-mails or articles or diaries and so on manner to express untangle, intellectually unsccramble or self-conciliation, in order to gain the psychological sedimentation, normal catharsis and release, consequently modify emotion state balance and emotion stabilization.

BRIEF SUMMARIES

Under special peacekeeping circumstance, the psychology pressure of the personnel of medical detachment is usually very great. We aim at individual psychology health status or ability and individuality characteristic carry through overall evaluation, and give corresponding debugging or interference and discipline methods from psychology health education or psychology modulation to behavior of psychology discipline or from spontaneity modulation to illumination leading, accidence explore cognition that diathesis discipline is effective methods to the preventive combat stress.

ABSTRACT

Objective: To present our experience in training and preventing combat stress of Chinese military medical personnel during the peacekeeping medical operation.

Method: We performed pre-deployment training and controlling stress during the missions, and post-mission stress management on stabilization staff.

Result: There were no psychological wounds, and we succeeded the medical support missions.

Conclusion: The army values training are availability preventive measures for stress.

References


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**LENINGRAD: UNDER SIEGE**

Dr. Simon Buslevich was completing his third out of five years of medical school when Nazi Germany attacked the Soviet Union in June 1941. By that September the German army had surrounded Leningrad, now called St. Petersburg. The defense of this city of 3 million people was extremely important to the Soviets, not only because it was the nation’s second-largest city and was named after the father of the Soviet Union, but because it blocked the Germans from sweeping through the north of Russia and engaging in an end-around attack upon Moscow. When the Soviet defenses in Leningrad resisted the Nazis’ initial attacks, Adolf Hitler allowed his armies to begin a brutal siege that would last over two years and claim the lives of 640,000 to one million Russians. Hitler ordered his generals to destroy the city and its population, and for nearly 900 days, the German forces exposed Leningrad to relentless shelling and air raids. In addition to the lethal bombing, starvation and the frigid Russian winters were responsible for the deaths of many thousands. During the wintertime, the «Road of Life» over Lake Lagoda created a tenuous connection to the outside world. The lake formed the eastern border of the city, and when it froze over in the wintertime, the Germans could not completely encircle Leningrad. The Russians laid railroad tracks from the closest station to the edge of Lake Ladoga, and ran trucks on the makeshift road across the icy lake, transporting food and other supplies into the starving city, and carrying children, the wounded and the malnourished out of the city. The Germans bombed and shelled the Road of Life, cracking the ice, and wounding or drowning many truck drivers and passengers.

Dr. Buslevich’s sister, a surgeon at a large Leningrad hospital, arranged his evacuation via the Road of Life in February 1942, when he was unconscious and suffering from kwashiorkor (severe protein deficiency). Buslevich’s medical studies were interrupted when Leningrad fell under siege. Though he did not yet have a degree, he began to apply what medical expertise he had acquired, in order to care for the civilian populace. Physicians were in short supply, since most who survived the initial attacks either voluntarily entered the Red Army or were drafted. There was a seven-day waiting list to receive a home visit from a doctor. From September 1941 through February 1942, Buslevich made home visits tending to the sick. Medical supplies that would facilitate effective treatment were scarce. Often the most Buslevich could do was to write «sick notes» allowing a worker to rest at home. Workers at this time were compelled to be at work in the absence of written permission from a physician.©

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**KEYWORDS:** Military medicine, World War II, Red Army, Leningrad, Stalingrad, Military medical history.
the contributions of all were needed to ward off the German peril. Leningrad was determined to continue producing war materials to repel Germany, despite the crippling siege. Leningrad rapidly exhausted its food supplies during the first few months of the siege. After standard sources of meat were depleted, starvation led people to devour all the dogs and cats in the city. Dr. Buslevich personally recalled eating two cats. Subsequently, residents consumed animal feed. The ration for a manual worker fell from 500 grams of bread in September 1941 to 250 grams in December 1941. Those engaged in non-manual labor and non-workers including children received 125 grams (5 ounces) of bread (equivalent to a maximum of about 438 kilocalories to 875 kilocalories per day) in December 1941, supplemented with a meat ration of 75 to 150 grams per month, and small amounts of sugar, fat, potatoes and other vegetables. The nutritional value of the bread was low; Dr. Buslevich characterized it as «about one-half defective rye flour, mixed with substitutes such as cellulose, malt, and bran». Some grew food in parks and gardens, but many resorted to eating rats and wallpaper paste.

The severity of the starvation during this time led to subsequent significant scientific studies of the physical and mental sequelae. In addition to the starvation, severe cold weather with no sewage, no heating, and no water except that collected directly from the river Neva, led to high mortality in the winter of 1941. Most of the medical complaints that Buslevich treated during the siege were related to starvation or cold weather. Frequently he would arrive at an apartment to find his «patient» already dead and frozen. Kwashiorkor, marked by tissue oedema resulting from reduced intravascular oncotic pressure, was rampant and frequently fatal. Other common manifestations of malnutrition he witnessed during this period included night blindness (Vitamin A deficiency), scurvy (Vitamin C deficiency), and pellagra (niacin deficiency). Buslevich’s own weight dropped to 40 kg (Vitamin C deficiency), and pellagra (niacin deficiency), and frequently fatal. Other common manifestations of malnutrition he witnessed during this period included night blindness (Vitamin A deficiency), scurvy (Vitamin C deficiency), and pellagra (niacin deficiency). Buslevich’s own weight dropped to 40 kg (90 lb) during the siege, and loss of up to one-third of pre-war weight was common. Buslevich described the siege, and coping with the widespread starvation, as the most difficult period of the war.

**STALINGRAD: PIVOTAL BATTLE**

Before the war, Stalingrad had become an industrial center, the third largest city in the Soviet Union, featuring the Oktyaber Tractor factory, Barrikady Metal Works, and Lazur Chemical Plant. Stalingrad was also a key center for Volga river barge traffic, shipping produce, chemicals and machinery inland. Throughout the war, the factories of Stalingrad produced tanks, guns, and other vital war materiel for the Red Army. In the summer of 1942, the Nazi generals began pushing towards Stalingrad. Originally a minor objective, both sides concentrated resources on the city until it became a metaphor for the entire Nazi–Soviet struggle.

The battle of Stalingrad was the pivotal battle in Europe during WWII, ending in a crushing setback for the German Army, and starting the retreat that eventually ended in Berlin. It was fought over 100,000 square kilometers for six and a half grueling months. Commanders on both sides refused to retreat or surrender. The struggle for the city quickly devolved into intense street fighting supported by German aircraft and artillery, and some parts of the city changed hands as many as three or four times a day during the height of combat.

Buslevich recalls that German aircraft were very punctual and would bomb the city for exactly twelve hours per day. At six in the evening, the aircraft would stop bombing and the artillery would commence. The German dive-bombers, or stukas, had sirens mounted under their noses that would scream whenever they launched a dive-attack. The noisy assault created a powerful psychological effect.

Typical buildings in the city had ground floors composed of brick or stone, and the upper floors built of wood. The German bombardment rapidly reduced entire city blocks to rubble, causing immense casualties to those who remained in Stalingrad: about 40,000 civilians died and 150,000 more were wounded.

Although Buslevich had encountered his «worst times» during the siege of Leningrad, the battle of Stalingrad proved terrible as well. While many died on the Stalingrad front, at least they were well fed, as compared with the cold and starvation of Leningrad. Buslevich’s division in Stalingrad started with about 15,000 soldiers. The most difficult time was September 3-20, when relentless German bombing and shelling destroyed most of the city’s buildings. After this terrible period, his division withdrew from the fight with only 700 soldiers and officers remaining. They returned to Moscow to reconstitute for the push westward. Many Red Army physicians were among those killed in Stalingrad because the rear echelons, including the medical battalion, found themselves in close proximity to the front line due to transportation constraints imposed by the Don River. They stayed on the left bank of the river where the fighting was in order to better support the troops, while evacuating casualties who were not expected to return to duty across to the right bank of the river.

In February 1942, Buslevich was evacuated over the Road of Life to Saratov, one of the German invaders’ next targets. After recovery, he entered the Red Army as a junior military physician in a med-punkt, a small medical group attached to a rifle infantry regiment. He was armed with a Tokarev TT («Tula, Tokarev») pistol, and accompanied his regiment to Stalingrad; all officers, including physicians, carried pistols or sub-machine guns. Later, during the battle of Berlin, a dying Soviet soldier gave Simon a Walther pistol, which had been taken from a German officer.

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- International Review of the Armed Forces Medical Services -

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MEDICAL CARE
IN THE RED ARMY

All Soviet soldiers received one or two hours of first aid instruction when their unit was first constituted, and all were provided with a rudimentary first-aid dressing. Each platoon had a sanitater, a line soldier with about two to six hours of first aid training, who would apply basic dressings, splints and tourniquets. Casualties were then funnelled to a casualty collection point at the company level, where a san-ins-truktor, who had about 3 months of medical training, would cursorily assess each casualty before sending them on to a med-punkt. Casualty flow was flexible up to the regiment level, enabling wounded soldiers to enter the system anywhere along the way.

Med-punkt is a generic contraction best translated as «medical site», the term was used to describe treatment areas at both the battalion and regimental levels. The battalion med-punkt is analogous to what other military forces label a battalion aid station; it was typically staffed by a feldcher, equivalent to a modern physician’s assistant, with approximately 3 years of medical training.

The battalion med-punkt often was crudely sheltered at best, under some trees or sometimes simply in a crater. The close proximity to the front enabled rapid access for casualties, but also carried risks from artillery and bombing. Medical functions performed at the battalion level med-punkt were limited to dressing changes, tourniquet adjustments, and most importantly organization of transportation to the med-san-bat. Buslevich remained in the regimental med-punkt for most of the battle of Stalingrad. At the regimental level the med-punkt was typically staffed by three junior physicians, supervised by a fourth, more experienced physician. All wounded were administered a tetanus anti-serum—the more effective tetanus anti-toxin was difficult for the Red Army to obtain, so the anti-serum was supplemented by the direct application of sulfadene to wounds. Anecdotally, the approach seemed to have worked well, since Buslevich saw only one case of tetanus during the entire war. Definitive treatment of lightly wounded casualties occurred here, and more severely wounded soldiers were sent to higher echelons of care. Everyone would receive the kartochka—a piece of paper with their name, description of their wound, and a record of treatment. Casualties were evacuated from the med-punkt to the med-san-bat (medical battalion) by either a horse-drawn sled or carriage, or sometimes in empty ammunition trucks that were returning to the rear areas to reload. There were no dedicated field ambulances. Upon arrival at the med-san-bat, triage was the first order of business, and this was Buslevich’s responsibility beginning in 1943, when he was assigned to the med-san-bat and remained there through the westward march to Berlin. Aside from the starvatation at Leningrad, triage posed the most difficult and psychologically stressful challenge that Dr. Buslevich faced during the war. His civilian medical education had not prepared him for this duty, and by the time it was taught upon his return to the military medical school after the war, he had already become an expert through painful experience. He alone was responsible for the triage of all casualties, sorting out the wounded which would most benefit from immediate surgical intervention, from those either not requiring surgery at all, those who could safely wait until later for surgery, and the expectant, who were expected to die regardless.

Incoming patients were received at the triage area, called the sortirovka or «selection.» Casualties would be marked with a 5”x8” card to indicate surgical priority and/or shock patients. Category 1 patients would be sent to the surgeons first. These patients usually suffered from penetrating abdominal wounds or other internal organ injuries caused by bullets, small fragments from mines, bombs, or artillery shells. Surgical anesthesia was obtained by the very effective method of a nurse dripping ether onto a wire-gauze mask.

Category 2 (shock) patients were sent to the shock tent, where they were cared for by a terapevt (internist). They required treatment for shock before they could undergo surgery. The internist would try to resuscitate those without a pulse, giving saline infusions of two to three liters over six to eight hours. Initial fluid resuscitation for shock (usually hemorrhagic) was intra-muscular injection of saline—intravenous therapy was not employed—with as much as 2-3 liters administered over 6-8 hours. Whole blood transfusions were used for those with an inadequate response, with the physicians frequently donating their own blood when the blood supply was exhausted. Injuries less serious than the first two categories were simply marked «light.» Many had bullet wounds in their thighs and lower extremities, since the well-disciplined German troops would fire from the trenches at knee-level to stop advancing Russian troops. If time allowed, the surgical team operated on the lightly wounded after taking care of all of those in Category 1.

Minor injuries were cleaned, incised and debrided, and left to heal via secondary intent. Patient could stay in the med-san-bat for up to 30 days. Overall, about 70-75% of the casualties arriving at the med-san-bat had only received light wounds. Another 15% suffered from serious, surgery-requiring injuries. The remaining 15% had major trauma and possibly serious head injury. Patients with head and kidney injuries were not operated on—they were sent to the head injury and urological departments of the army hospitals, but mortality rates were high.

The med-san-bat was a medical «battalion» similar to a Vietnam-era U.S. Mobile Army Surgical Hospital (MASH), it was a division level asset. It was located in the rear area of the division, either in its own tents...
or in an abandoned building such as a church or school. Physicians at the med-san-bat performed surgeries, resuscitation and provided basic medical care, treating as many as 150-200 casualties at a time. Buslevich remembers frequently working 24 hours straight, catching quick cat-naps on piles of bloody discarded clothes when he couldn’t keep his eyes open any longer. The patient load was often so overwhelming that Buslevich not only provided medical care, but also helped to carry and to undress his patients, and at times even performed surgical procedures.

As many as four surgeons, with 6 operating room tables, were attached to the med-san-bat, and were kept busy performing any kind of surgery except that involving the brain or kidneys. The med-san-bat was also staffed with ten to fifteen nurses (five of them surgical), one internist, five medics, and a number of orderlies and supply personnel; there was a holding capacity sufficient to care for patients for as long as ten to fifteen days. A public health officer, or sanitarniy vrach, was responsible for disease surveillance and preventive medicine. The chemical warfare officer, or toxikolog, also helped to direct and coordinate the evacuation of the wounded. The dentist, a woman in Buslevich’s battalion, would circulate around the maneuver units during a static defense to provide routine dental care.

The surgical teams worked as well as they could with what meager supplies they had. Since there were no parenteral antibiotics until 1944 (when penicillin arrived from Canada through Murmansk and Archangelsk) sulfa powder was directly applied to wounds. Infection with normal skin flora (Staphylococcus and Streptococcus) was common. Surgeons wore surgical masks and gowns, and scrubbed for ten minutes with soap, water, and alcohol prior to procedures. However, they did not have gloves. Their equipment was designed to be portable, and they carried their instruments in metal boxes. Medical personnel set up folding operating tables in homes, schoolhouses, or former churches, which under communism had been transformed into «community centers».

The most difficult injuries to treat were penetrating abdominal wounds. Drains were placed at the time of surgery on major abdominal wounds, facilitating direct administration of antiseptics through the drain. Bowel perforations carried a 90% mortality rate with or without surgery, making those performing triage think twice before dedicating valuable operating room time to such patients.

Extremity wounds, especially involving the legs, were particularly common. These were frequently complicated by gangrene, presumably due to Clostridium perfringens, because fragments or shells had introduced dirt into the wounds. Small fragments more frequently resulted in gangrene than did bullets. Physicians administered anti-gangrene serum, which appeared to have little effect, supplemented by fasciotomy and amputation as necessary. Surgeons sometimes treated gangrenous patients with full thigh and calf incisions, though it was more common to amputate the infected limb, typically at the thigh level. Amputations were also commonly used for severe limb injuries. Non-surgeons such as Buslevich could perform these only after being «signed-off» by the senior surgeon. A specialized nurse performed casting of limb fractures. Penetrating brain injuries were not treated at the med-san-bat, but were referred to a «first-line» hospital in the rear area.

Patients who did receive surgery at the med-san-bat would be held ten to fifteen days after surgery until they were deemed competent to travel, and then they would be evacuated to the first-line hospital that typically served three to five divisions of the Red Army. The first-line hospital would hold them for about a month in a protected rear area before evacuating them to a «front» hospital. One of these hospitals served each of the four fronts against the Germans. In the second part of the war the Red Army was pushing the Germans back quickly, and patients who could not be transported after surgery had to be left behind. In these cases an internist and one nurse would stay with the patients and the med-san-bat would follow the division. After their condition improved, they would be sent to a hospital and the internist and nurse would have to catch up to their division. Those patients with less serious injuries were kept at the med-san-bat if they could return to the front within two weeks. Approximately 75% of patients returned to their units. Most soldiers wanted to go back to their units to rejoin their comrades. For those who died, the medical battalion took responsibility for sending death notices to the next of kin. Buslevich was quite proud of the overall quality of medical care his med-san-bat could provide, for he felt it was easily the equal of peacetime care.

The med-san-bat received its supplies from a special pharmacy warehouse designated for the particular front. A senior medical sergeant ran the warehouse and supplied the medical battalion with gauze or muslin bandages, morphine and other narcotics, normal saline, ether, camphor, wooden splints, wire-ladder splints, and casting supplies, among other equipment. All medical supplies were produced in Russia.

PERSONAL HISTORY AND ANECDOTES

During his time serving the Red Army as a physician, Buslevich frequently found himself in the middle of combat. Although he had several close calls, he escaped serious injury. In Stalingrad he suffered superficial shrapnel wounds but quickly recovered. Another time Buslevich was located in the basement of a building when a bomb struck about a meter away out-
Plaster rained down on the patients from the ceiling but the building held. A woman physician was evacuated in shock after this.

In Kuban, in December 1943, a bomb landed directly on the OR tent during the course of an operation. In addition to the loss of several patients, one surgeon was killed, another lost his legs, and two nurses died. On another occasion, during a lull in the fighting for Stalingrad in September 1942, Buslevich and some colleagues visited a neighboring medical unit that had obtained some fresh eggs. They enjoyed a meal of hot scrambled eggs, but as they were leaving, a bomb landed on the tent and killed all of their hosts.

Subsequent to the Allied victory in Berlin, Buslevich met some American soldiers for the first time in May 1945, on the East bank of Elba. Eager to speak with an American, but knowing no English, Buslevich saw one soldier who he thought might be Jewish, and asked him in Yiddish if he might speak with an American Jew. The American showed him to a German house where another soldier warmly greeted him, and invited him to join them for a dinner of meat and potatoes, beans, and wine. Though neither Buslevich nor the American spoke Yiddish well, they managed to understand each other, and the American translated between Buslevich and a group of a dozen other Americans. Buslevich learned that his new American friend was a lawyer from New York, and they talked for about 3 hours. Amazingly, the American knew Buslevich’s uncle, who had emigrated from Russia to Brooklyn in 1904. They exchanged news and gifts, and assumed they would never see each other again.

In 1946, Buslevich returned to the Military Medical Academy in St. Petersburg to complete his diploma requirements, along with 28 other veterans who had worked as physicians during the war. He remained in the army until 1972, rising to the rank of major before retiring after several decades of service.

Buslevich continued to practice as a civilian physician until 1991. He started as a general surgeon and later became a self-trained proctologist. His services were in high demand as improved living standards following the war enabled a diet richer in protein and fat, resulting in more frequent colorectal disease.

In 1991, Dr. Buslevich moved to suburban Maryland, near Washington, DC, and with the assistance of the Red Cross, was able to connect with his old American friend. This led to a tearful reunion, where they both fervently recalled their meeting, and both had kept the mementos they had exchanged that day in the German countryside in 1945.

Dr. Buslevich ponders his wartime experiences on a daily basis and will never forget his wartime friends. Dr. Buslevich is a member of the Association of Veterans of World War II. He is also haunted by a recurring dream that he failed to return to medical school after the war and never received his diploma. Symptoms of posttraumatic stress are remarkably common, and persist for decades, in many combatants, including medical personnel, though, like Dr. Buslevich, are able to succeed admirably in their careers and lives.

**CONCLUSIONS**

As Santayana said, «Those who cannot learn from history are doomed to repeat it». While the omnipresence of television cameras may make it unlikely that the world will ever see another siege inflicting the prolonged, severe starvation that Dr. Buslevich experienced in Leningrad, the street-by-street, house-by-house battle that he witnessed in Stalingrad does have particular implications for future conflicts. The increasing urbanization of the world’s population, as well as the realization that modern weaponry makes it impractical for a less technologically sophisticated force to try to meet an adversary on an open battlefield, is likely to make urban street-fighting the centerpiece of future campaigns. It is important for us to revisit and learn from prior urban battles, from Stalingrad to Mogadishu, to help today’s military forces to best array our troops and supporting medical personnel. In addition, while there have been tremendous advances in medical technology (e.g., fibrin bandages) and force structure (e.g., forward surgical teams and rapid eva-
cuation with critical care air-transport teams), triage remains a particularly thorny issue that we in the military must uniquely train our physicians to be able to do quickly and effectively. To these ends, the reflections of those who have had painful experience in prior wars are invaluable.

**ABSTRACT**

We present the historical account of a Red Army physician who experienced the siege of Leningrad and battles of Stalingrad and Berlin during World War II. We highlight the timeless significance of being adept at triage, as well as the horror of the starvation at Leningrad, and the street-to-street fighting at Stalingrad.

**ACKNOWLEDGEMENT**

This history is based upon two interviews conducted with Dr. Buslevich by 2LT Lesperance and LTC(P) Roy, with the assistance of Dr. Buslevich’s step-daughter, in February, 2004. We gratefully acknowledge the time that Dr. Buslevich, his wife, and step-daughter provided in inviting us into their home.

**REFERENCES**

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