

ACINETOBACTER BAUMANII NOSOCOMIAL INFECTIONS OF BURNT PATIENTS AT MOHAMED V MILITARY HOSPITAL IN RABAT, MOROCCO

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ABSTRACT

Objectives: The present work aims at bringing out the epidemiological profile of burnt patients infected by *Acinetobacter Baumanii* and investigating the risky factors related to this pathology.

Patients and Methods: This is a retrospective study carried out on 212 burnt and infected patients, hospitalized in Burn Unit at Mohamed V Military Hospital in Rabat, during the period 2004-2012. Among these patients, we registered 50 cases of *Acinetobacter Baumanii* infection.

Results : Among the burnt patients infected by *Acinetobacter baumanii*, males are significantly more frequent with sex-ratio of 1.5. Moreover, the most concerned age group is 30 to 39 years old. The average age is 37.9 ± 17.7 years old. The results also show that *Acinetobacter baumanii* is the most resistant to antibiotics, all types together. Indeed, it resisted the antibiotics in 76% of the cases. The study of Unit Burn Standard (UBS) shows that 42% of cases are severed to mortal. Furthermore, Baux index (IB) shows that 44% of cases have bad to the worst prognosis. As for the evolution of patients, 16% of the cases are dead and 50% have a favorable evolution after graft. The statistical analysis reveals that the risk of death in burnt patients infected by *Acinetobacter baumanii* is three times as high as that of burnt patients infected by other germs (OR= 3.2 ; IC= 1.2-8.9). Besides, women have the risk of death six times as high as men (OR= 6 ; IC= 1.1-33.7).

Conclusion: Health authorities in our country may give more importance to the hospital hygiene by motivating and sensitizing all the health system participants.

Keywords: Burnt patients, infection, *Acinetobacter baumanii*, resistance, antibiotics, Morocco

INTRODUCTION

The nosocomial infections are the infections acquired in health care establishment and which were not accepted or covered at hospitalization time. [1]

The nosocomial infections are known in the entire world and affect also developed countries on which poor countries depend on. The incurred infections in the medical field appear among the major causes of death and morbidity increased among patients. They represent an important charge for the patient as much as for the public health. An inquiry of prevalence

carried out for OMS in 55 hospitals of 14 countries representing four Regions OMS (Europe, the oriental Mediterranean, South-East Asia and the occidental Pacific) showed that on average, 8,7 % of the in-patients were affected by an nosocomial infection. At every moment, more than 1,4 millions of people in the world suffer from infectious complications acquired in the hospital [2]. The maximal frequency have been relyed on in the hospitaes of the oriental Méditerranéan and South-East Asia regions (11,8 % and 10,0 % respectively), and the prevalence attained 7,7 % in Europe and 9,0 % in the occidental Pacific [3]. The most frequent nosocomial infections are the infections of operating place, the urinary infections and the low respiratory infections. The OMS's study and other studies as well showed that the maximal prevalence of nosocomial infections are observed in the centers for intensive health care and in the unit of surgery for emergency and orthopaedics. The infection's rates are also higher within vulnerable patients, an underlying illness or a chemotherapy.

In Morocco, although there is still existe no national regulation demanding the declaration of all the nosocomial infections' cases [4], the struggle against these infections started to arouse the interest during the last years and certain hospitals developped their own program. Thus, the first national inquiry on nosocomial infections had been conducted in 1994 and revealed the prevalence's rate of 14 % [5].

Acinetobacter baumannii is a bacterial species frequently identified in human nosocomial infections. It's about a coccobacillus of negatif Gram, commensal of the skin and mainly of its moist humid regions and digestive tract. It's a opportunistic pathogen which can be responsible of dangerous infections though its weak virulence, in particular for the immunocompromised patients. The effect of infections by the Acinetobacter baumannii has dramatically increased during the last 30 years particularly in the unit wth high risk (unit of intensive health care) [6, 7]. In France, the Acinetobacter has been isolated in 9% of nosocomial infections in 1995, when they represented just 1% of those in 1983 [8].

In this context, the aim of the present work consist, on one hand, of drawing up the epidemiological profil of burnt patients infected by Acinetobacter baumanii at the burn unit in Mohammed V military hospital in Rabat, and on the other hand, of investigating of the risk factors related to this pathology.

MATERIELS AND METHODS

The present study is based on 212 burnt patients affected with nosocomial infection, hospitalized in the Burns Unit at Mohammed V Military Hospital of Instruction in Rabat. It's about a retrospective study carried out on the period from January 2004 to December 2012.

The data gathering was done on the patients records. The variables in which we are interested are : sex, age, germs, the evolution and the resistance to antibiotics.

within the framwork of this study, and among 212 patients, we are interested in those 50 infected by the Acinetobacter baumanii.

The results are expressed for the effectives of the qualitative variables (en moyenne \pm écart-) type of the quantitative variables. The statistical analysis was done with the help of S.P.S.S.

(Statistical Pack for Social Sciences) software. We were helped with nonparametric statistical test Chi-deux (χ^2) to compare the effectives observed and the risk related to investigate the associations between the variables studied.

RESULTS

The results of the allocation of the infections according to the germ show that the infections by Staphylococcus are the most frequent for the burnt patients with 234 sites burn, 39% %

(figure 1). The infections caused by *Pseudomonas* is in the 2nd position with 18% of sites, followed with those caused by *Acinetobacter baumannii* with 16 % of sites.

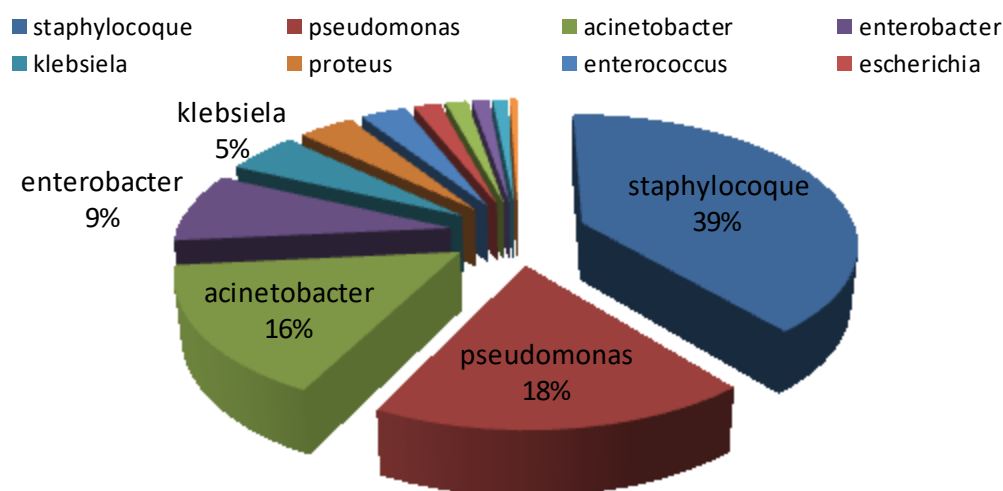


Figure 1: The allocation of the burnt sites according to the germs of the burnt patients at Mohamed V hospital in Rabat

Furthermore, we studied the allocation of the germs according to their resistance to antibiotics used in Burn Unit. The results show that *Acinetobacter baumannii* is the most resistant to antibiotics, all types together (figure 2). In fact, *Acinetobacter baumannii* resisted the antibiotics in 76% of the cases whereas *Klebsiella* and *Enterococcus* resisted the antibiotics in 47% and 42% of the cases respectively.

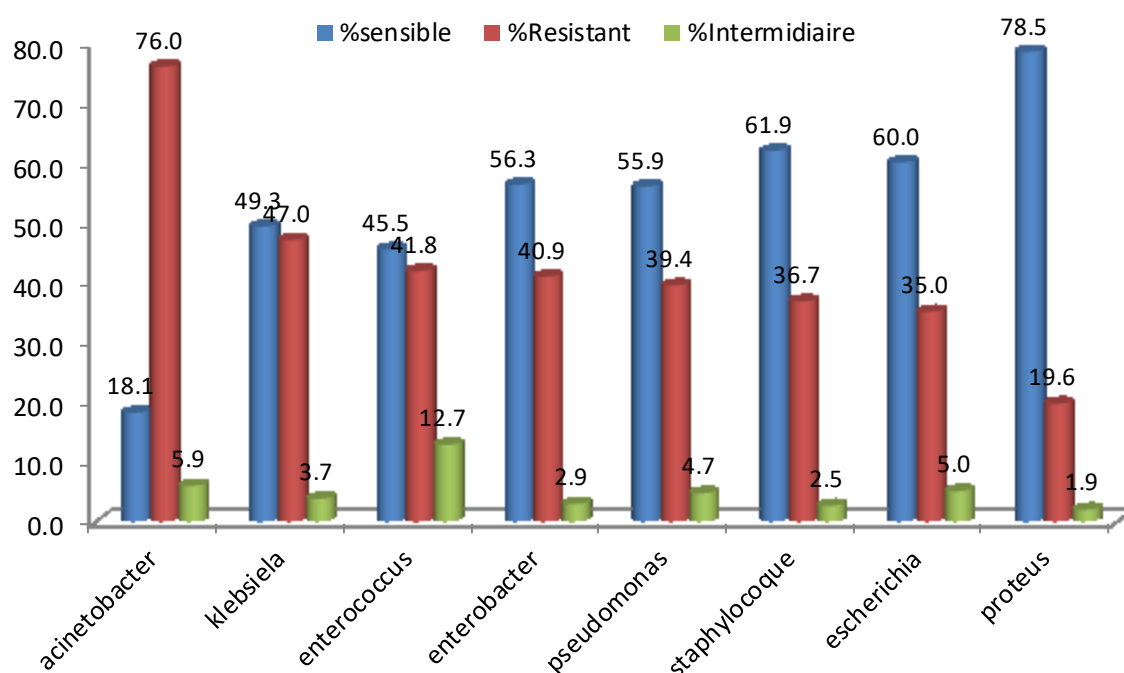


Figure 2: the allocation of the germs according to the resistance to the antibiotics in the Burn Unit at Mohammed V hospital in Rabat.

Profil of the patients infected by *Acinetobacter baumannii*

Among the 50 cases studied, 60% are male and 40% are females, a sex-ratio of 1,5. However, the difference is statistically non significant ($\chi^2 = 2$; $p=0.157$). On the other side, 96% of burns are termic and 94% are home burns. Besides, 24% of infected patients are diabetics.

Concerning the allocation of patients according to the age, the 3rd figure shows that age bracket from 30 to 39 years old is the most concerned with nosocomial infections by *Acinetobacter baumannii* with 24%, followed with those from 20 to 29 year old and those from 50 to 59 years old with 20% and 18% respectively. The average age of the patients is 37.3 ± 17.7 years old (1 - 80).

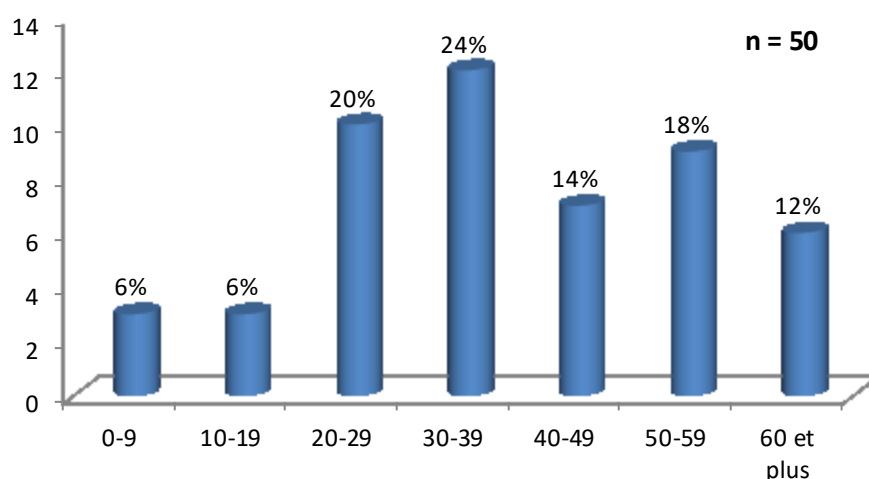


Figure 3: The allocation of the patients infected by *Acinetobacter baumannii*, according to the age

Profil of burns infected by *Acinetobacter baumannii*

We get help from Burn Unit standard to evaluate the seriousness of burns infected with *Acinetobacter baumannii*. The 4th figure presents the allocation of these ones according to their seriousness. In fact, 42% of the cases found in the Burn Unit are serious to death, whereas the rest of cases remains non serious.

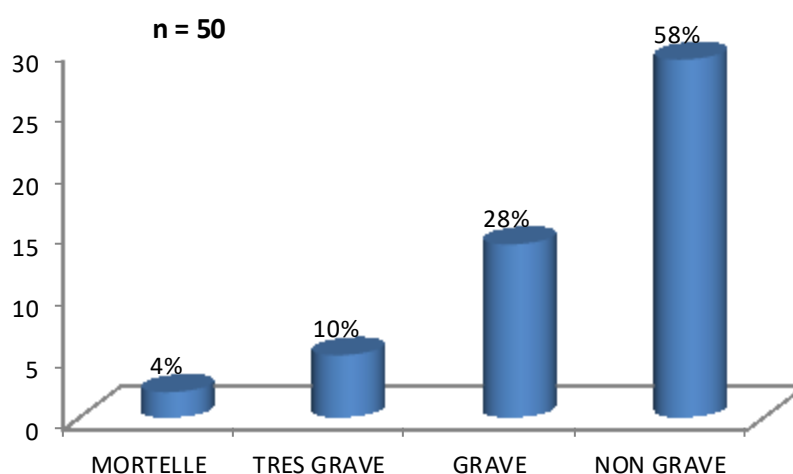


Figure 4: The allocation of the patients infected by *Acinetobacter baumannii*, according to burns unit standard

Moreover, the clue of Baux allowed us to classify the burns infected by *Acinetobacter baumannii* according to the pronosis. In fact, the 5th Figure shows that the pronosis appears bad to very bad in 44% of the cases, while it was good in 56% if the cases.

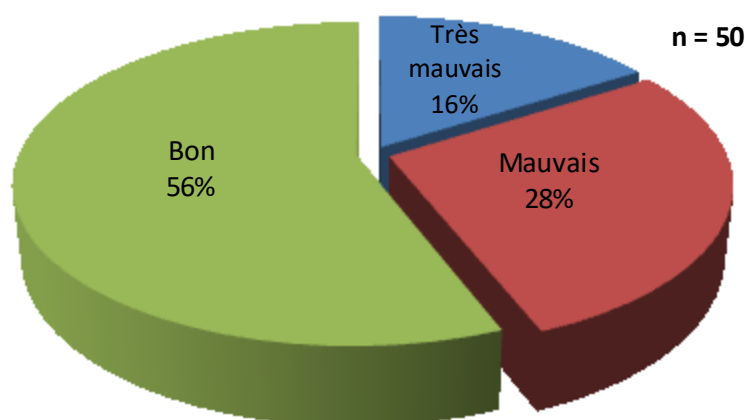


Figure 5 : The allocation of the patients infected by *Acinetobacter baumannii*, according to the clue of Baux

The Evolution of burns infected with *Acinetobacter baumannii*

The results concerning the evolution of the burnt patients infected by *Acinetobacter baumannii* are summarized in the 6th figure. The death has occurred to 8 patients, a specific lethality of 16%. The evolution has been favorable in 34% of the cases and favorable with graft in 50% of the cases.

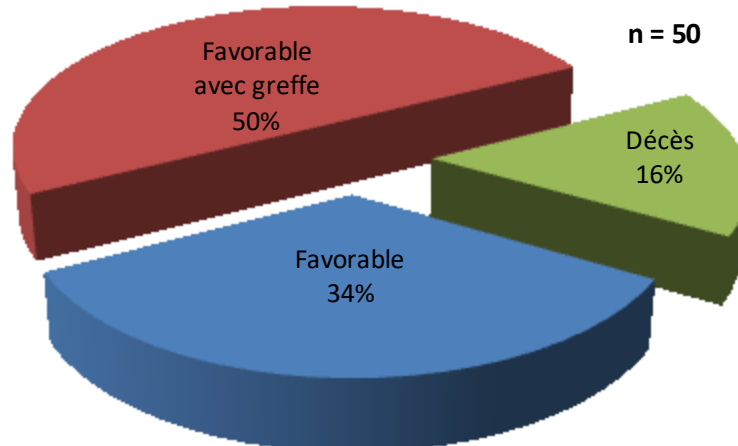


Figure 6 : The allocation of the patients infected by *Acinetobacter baumannii*, according to the evolution

The study of the risk of death

The analysis of the risk of death of the burnt patients infected by *Acinetobacter baumannii* shows that these present three times the risk of death compared with the burnt patients infected by the other germs (RR= 3.2 ; IC= 1.2-8.9).

The study of the risk of death according to the sex shows that burnt women infected by *Acinetobacter baumannii* are six times faced to the risk of death compared with burnt men infected by the same germ (RR= 6 ; IC= 1.1-33.7).

Concerning the risk of death according to age brackets, the study shows that they present all the risks of death non significatives.

DISCUSSION

The results of the present study shows that the infection by *Staphylococcus aureus* are the most frequent for the burnt patients, followed respectively with those caused by *Pseudomonas aeruginosa* and *Acinetobacter baumannii*. This result suits the one obtained of the previous studies [9].

Moreover, the specific lethality related to nosocomial infections by *Acinetobacter baumannii*, which is 16% in the present study, is slightly lower to those registered in other studies [10].

Besides, the study of the allocation of germs depending on their resistance to antibiotics used in the burn unit shows that *Acinetobacter baumannii* is the most resistant to antibiotics, all types combined. This suits the results of other studies which tackled the same subject [14,15].

Concerning the sex, the male predominance observed in our study (60%) suits the results of the previous studies [11,13]. Nevertheless, the difference appears statistically non significative, which makes suppose that this redominance can be related to the type of recruitment at the military hospital. Avicenne represented essentially by a male military population [13].

On the other part, the middle age in our studie, which is of 37.9 ± 17.7 years old, is slightly lower than the one nationally found in an other study and which is of the order of $52,3 \pm 12,54$ years old [13]. In fact, the most affected age bracket with nosocomiale infections by *Acinetobacter baumannii* is the one including 30 and 39 years old. This causes an unconformity with the data of the previous studies which makes the predominance of age bracket more than 40 years old [11,13].

CONCLUSION

The nosocomial infections are largely the consequence of a certain dagnostical and therapeutic progress of medecine. Their pronostics depends essentially on the field of the patients infected and on the multi-resistance of the germs in question of antibiotics.

Taking into account the gravity of the infection, the main cause of burnt patients' mortality, all the means implemented are currently oriented to the preventive measures.

At the present time, the growing awareness which the acquired infections at the hospital represents a major problem of the public health and indicates in the world centre.

Hospitable hygiene is a matter of all members (professionnels, managers and decision-makers of health). A great motivation of all these speakers is necessary to meet the challenge arised at the hospital in terms of quality and cost, and for the patient, in terms of security.

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