

Epidemiological and Prognostic Assessment of Nosocomial Infections in the Surgical Emergency Resuscitation Department IBN Tofail Hospital

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DOI: [10.36347/sasjm.2024.v10i05.014](https://doi.org/10.36347/sasjm.2024.v10i05.014)

| Received: 25.03.2024 | Accepted: 03.05.2024 | Published: 15.05.2024

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Abstract

Original Research Article

Nosocomial infection is an infection acquired in a healthcare establishment. It is acquired more than 48 hours after admission [1]. Intensive care units are considered a reservoir of multi-resistant bacteria due to the critical condition of patients and the practice of certain invasive care [2]. NI constitute a public health problem marked by high morbidity and mortality. The objectives of our study are:

- Detail the epidemiological profile of IN
- List ATB-resistant germs
- Determine the main prognostic factors

We carried out a prospective study from January to June 2022 including patients hospitalized during the period in the HIT RUCH department. Patients whose stay was less than 48 hours were excluded. The diagnosis of IN was suggested based on clinical and paraclinical signs and then confirmed by bacteriological analyses. The resistance profile of the germs to ATB was reported by the results of the antibiogram. Among the 92 patients who stayed more than 48 hours in intensive care, 19 presented with IN, an incidence of 20.65%, of which 89% were male and the median age was 51.7 years. The time to IN acquisition was 5.1 days. IN at the pulmonary site were predominant with a percentage of 36.84%. The germs responsible for IN were dominated by BGN including acinetobacter baumannii with 42.1% and its resistance to ATB was 100% to C3G, 65.6% to amikacin; CGP germs were represented by staphylococcus aureus with 15%. IN-related mortality was 42%. It appears in the light of our results that IN and resistance of germs to ATB are worrying. Judicious use of ATB, hand washing and use of sterile equipment are essential to reduce the incidence of nosocomial infection.

Keywords: Nosocomial Infections, Epidemiological, Prognostic, The Surgical Emergency Resuscitation, Ibn Tofail Hospital, Marrakech.

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INTRODUCTION

Nosocomial infection is an infection contracted in a healthcare establishment (hospital, clinic, etc.), it is also called healthcare-associated infection. It is generally acquired more than 48 hours after admission [1]. Intensive care units are considered a significant reservoir of multi-resistant bacteria and a place where the occurrence of nosocomial infections is very frequent due to the critical condition of patients and the consistent practice of certain invasive care. These actions are accompanied by an increased risk of colonization by microorganisms of endogenous or exogenous origin [2].

Nosocomial infection in intensive care settings constitutes, today, a real public health problem. In

Morocco, although there is not yet a national regulation requiring the reporting of all cases of nosocomial infections [3], the fight against these infections has started to arouse interest in recent years and some hospitals have developed their own program. Thus, a first national survey on nosocomial infections was conducted in 1994 and revealed a prevalence rate of 8.1% [4-7].

Nosocomial infections constitute a public health problem marked by high morbidity and mortality.

The objectives of our study are:

- Detail the epidemiological profile of nosocomial infection
- List the main antibiotic-resistant germs
- Determine the main prognostic factors

Citation: Marina A. Nde Ngala, Prince B. Mavoungou, Youssef EL Ouard, Mohammed Khallouki. Epidemiological and Prognostic Assessment of Nosocomial Infections in the Surgical Emergency Resuscitation Department IBN Tofail Hospital. SAS J Med, 2024 May 10(5): 361-364.

PATIENTS AND METHODS

We carried out a prospective study from January to June 2022; all patients hospitalized during this period in the surgical emergency intensive care unit of Ibn Tofail hospital were recorded.

The inclusion criteria were:

- all patients hospitalized for more than 48 hours and who developed a healthcare-related infection.
- Patients over 18 years old.

All patients whose stay was less than 48 hours and those hospitalized for community infection were excluded.

The diagnosis of nosocomial infection was considered based on clinical and paraclinical signs and then confirmed by bacteriological analyzes (Blood culture, central venous catheter samples, ECBU and Protected Distal Sampling). The resistance profile of the germs to antibiotics was reported by the results of the antibiogram.

Information is collected from patient records. An operating sheet was completed, on anamnestic data, diagnosis, type of surgical intervention, type and duration of invasive procedures.

The statistical analysis was carried out by Epi-info

RESULTS

In our study of the 92 patients who stayed more than 48 hours in intensive care, 19 presented a nosocomial infection, an incidence of 21.65%, of which 89% were male and the median age was 51.7 years with extremes of 16 – 102 years. The time to acquisition of nosocomial infection was 5.1 days.

Nosocomial infections at the pulmonary site were predominant with a percentage of 36.84% followed by bacteremia (15.45%) then urinary infections (20.6%) as well as surgical site infections (3.8%). and catheter infections (1.4%).

Resistance of the main germs to antibiotics:

The germs responsible for the nosocomial infection were dominated by BGN including acinetobacter baumannii with 42.1% and its resistance to antibiotics was 100% to C3G, 65.6% to amikacin; gram-positive cocci germs were represented by staphylococcus aureus with 15%.

1. Acinetobacter baumannii:

- * Imipenem = 100% of cases; Ciprofloxacin = 97%; Amikacin = 82.85% of cases; Ceftazidime = 25% of cases.

- * No strain was resistant to colistin.

2. Staphylococcus aureus:

- * No Staphylococcus aureus with reduced sensitivity to glycopeptides was isolated.

3. Escherichia coli:

- * 81% for Amoxicillin; 38.09% for 3rd generation cephalosporins and Imipenems; and 9.52% for Gentamicin.

4. Klebsiella pneumoniae:

- * Third generation cephalosporins and Ciprofloxacin = 75%; Amoxicillin = 70%; the Amoxicillin Clavulanic acid combination = 60%.

5. Pseudomonas aeruginosa

- * Resistance to Ticarcillin was 92%.
- * All strains were sensitive to Amikacin.

Mortality linked to nosocomial infection was 40.6%

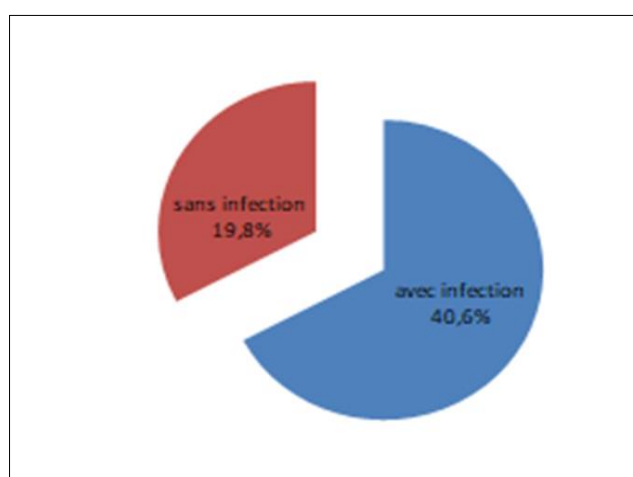


Figure 1: The mortality rate in infected and uninfected patients

DISCUSSION

Hospital infection is certainly a good marker of quality, not only of care but also of training in hospital hygiene at the level of a hospital establishment [8]. Due

to its high human and material cost, nosocomial infection represents a major public health problem which concerns both public authorities and healthcare teams.

Nosocomial infection is the leading adverse event in frequency in intensive care units, affecting 7% of hospitalized patients each year [9]. In our study the incidence was 21.65%, a high rate compared to those of

European countries which vary considerably depending on the country between 5.5 and 9.9% of hospital admissions [10].

Etudes	Taux de prévalence globale de l'infection	
	Tout service confondu	Service de Réanimation
France 2004 (37)	-	7,5
Royaume Uni 2005 (38 ; 39 ; 40 ;41)	5-15	25
Brésil 2004(42)	-	11,8
Suisse2000(43)	9,8-13,5	12,8-26,5
Etat Unis (44 ; 45 ; 46)	-	6,4-24
Laquintinia Douala, Cameroun 2013(48)	-	12
CHU Ibn Rochd Casablanca 2000(52)	-	12,3
CHU Hassan 2 Fés 2011 (53)	-	25,7
Notre étude	-	21,6

The proportions of the different types of relative infections in this study seem to fit relatively well with those in the literature: pneumonia comes first, followed by urinary infections and bacteremia. Our results also match those of the study carried out by the French RAISIN in 2006. In the work carried out in the intensive care unit of the Ibn Roch University Hospital [11].

Acinetobacter Baumannii is responsible for 5 to 10% of severe nosocomial infections in intensive care units [12]. *Acinetobacter Baumannii* resistance affects many classes of antibiotics: broad-spectrum beta-lactams, aminoglycosides and fluoroquinolones [13].

The most serious nosocomial infections can be linked to the death of patients, but it is extremely difficult to attribute the responsibility for the death to nosocomial infection. Indeed, when a death occurs as a result of an infection, it is very difficult to distinguish what is due to the main condition which led the patient to intensive care, any associated pathologies, or the nosocomial infection itself. same or other intercurrent events. In addition, all studies show that patients who become infected are on average more serious on admission (often with multiple organ failures) than those who do not become infected [14].

CONCLUSION

It appears in the light of our results that nosocomial infections and resistance of germs to antibiotics are worrying and constitute a real public health problem linked to high morbidity and mortality. Prevention is the best way to limit the risk of nosocomial

infection, hence the judicious use of antibiotics, hand washing and the use of sterile equipment are essential to reduce the incidence of nosocomial infection. The prevalence survey remains a recommended surveillance technique for developing action plans.

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