Epidemiology of Bacterial Infections in the Maternal Intensive Care Unit of Ibn Tofail Hospital, Marrakech

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DOI: 10.36348/sjpm.2022.v07i03.007 | Received: 08.02.2022 | Accepted: 12.03.2022 | Published: 16.03.2022

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Abstract

Background: The purpose of this study is to evaluate the epidemiology and analyse the level of antibiotic resistance of Ab strains in the intensive care unit of the Ibn Tofail Hospital of the Mohammed VI University Hospital of Marrakech.

Results: Microbiologically, 200 samples were analyzed, of which urine was the most frequent sample with a rate of 36% of all samples, followed by blood cultures with a rate of 36%, catheters in 12%, vaginal samples in 7% and protected distal samples in 3%. The analysis of the resistance profile of germs to antibiotics showed that for Beta-lactams: 81% are extended-spectrum beta-lactamases (ESBL) 16% low level penicillinase (LLP) and high level penicillinase (HLP) at 3%.

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INTRODUCTION

Nosocomial infections in the intensive care unit are a constant concern because of the increased cost and length of hospitalization they entail.

Nosocomial infection is a frequent and potentially lethal complication in obstetrics. The incidence of this complication may be underscored and an accurate surveillance system must be used in each obstetrics unit for infection control. This surveillance system should also identify the patients at risk for infection in order to improve prevention efforts.

MATERIAL AND METHODS

We conducted a retrospective study over a period of one year (from August 1, 2017 to July 31, 2018). It concerned all the strains isolated in different samples taken at the level of the maternal resuscitation service, and analysed at the level of the microbiology laboratory of Ibn Tofail Hospital, Mohamed VI university hospital of Marrakech.

The aim of our study is to determine the epidemiological profile of nosocomial infections in the intensive care unit.

RESULTS

In our study the average age was 32.2 years with extremes ranging from 20 to 41 years. The reason for hospitalization was preeclampsia in 106 cases that is 53% of all cases, eclampsia in 15 cases (7.5%), delivery hemorrhage in 35 cases (17.5%), severe acute asthma in 4 cases (2%), gravidic hepatic steatosis in 2 cases (1%), retroplacental hematoma in 1 case (0.5%), and indeterminate in 37 cases (18.5%).

Mean gestational age was 35 weeks of amenorrhea (WA) with extremes ranging from 29 SA to 40 SA.

Table 1: Epidemiological and clinical characteristics

| N= 200 cases | Rate (%)       |
|--------------|----------------|
| Average age of mother | 32.2 years [20-41] |
| Average gestational age | 35 [29 WA - 40 WA] |

Indications for hospitalization

| Indicator                  | Rate (%) |
|----------------------------|----------|
| pre-eclampsia              | 53%      |
| eclampsia                  | 7.5%     |
| delivery hemorrhage        | 17.5%    |
| severe acute asthma        | 2%       |
| gravidic hepatic steatosis | 1%       |
| retroplacental hematoma    | 0.5%     |
| indeterminate              | 18.5%    |

Citation: R. Rada, S. Khayati, L. Ait Said, K. Zahlane (2022). Epidemiology of Bacterial Infections in the Maternal Intensive Care Unit of Ibn Tofail Hospital, Marrakech. Saudi J Pathol Microbiol, 7(3): 121-124.
In our study 200 samples were analyzed, of which urine was the most frequent sample with a rate of 36% of all samples, followed by blood cultures with a rate of 36%, catheters in 12%, vaginal samples in 7% and protected distal samples in 3%.

Of all the samples, 54 showed positive cultures, i.e. 27% of the samples. These strains were mainly isolated from urine cytobacteriological examinations (88.5%) followed by blood cultures (4.4%).

The most common bacteria were: *Acinetobacter baumanii* (53%) and *Klebsiella pneumoniae* (19.2%).

The analysis of the resistance profile of germs to antibiotics showed that for Beta-lactams: 81% are extended-spectrum beta-lactamases (ESBL) 16% low level penicillinase (LLP) and high level penicillinase (HLP) at 3%.

Multidrug-Resistant bacteria (MDRB) strains represent 65% of the total number of strains and are largely dominated by *Acinetobacter baumanii* 69% followed by Enterobacteriaceae producing extended-spectrum Beta lactamases 21.2%, ceftazidime-resistant *Pseudomonas aeruginosa* 6%, and finally methicillin-resistant *Staphylococcus aureus* MRSA 3.8%. No glycopeptide-resistant enterococci were isolated.
DISCUSSION

Overuse of antibiotics is a major challenge worldwide and undermines measures to control antimicrobial resistance (AMR). Failure to control AMR is leading to an increase in mortality, prolonged hospital stays, worsening of clinical conditions and increase in the cost for treatments [1-3]. AMR and specifically, resistance to antibiotic agents for treating bacterial infections, is a major problem in many African countries [4-6].

Again history shows how in high-income countries, a tolerance of poor hygiene in health institutions coincided with the growing reliance on antibiotics, which in turn perpetuated inappropriate use and poor drug stewardship, thus contributing to emerging resistance [7, 8]. Moreover, the difficulty of distinguishing between hospital- or community-acquired infections, and the scope for risks in both directions, created ambiguity regarding where action should be targeted and a perceived need for universal precautions [9, 10].

In our study the incidence of nosocomial infections was 27%. Our figures are among the highest in the literature; in Tunisia, a study showed an incidence rate of 29.3% [11]. For Western countries, the rates are lower.

The rate of imipenem-resistant AB found in another study is similar to that of a study conducted in the Microbiology Laboratory of the Hospital of Specialties in Rabat in 2006 [12].

The emergence of carbapenem resistance in Acinetobacter baumannii has become a worldwide concern as these molecules are often the only effective treatment against multi-resistant strains [13].

The urgent need to prioritise improvements in quality of care during delivery, as well as during pregnancy, the puerperium and beyond, is one of the key messages of the call to action in the recent Lancet series on maternal health [14]. Quality care has been defined as 'care which is effective, safe and a good experience for the patient [15], and requires action on six dimensions of quality [16], including technical skills as well as infrastructure.

The prevalence of healthcare-associated infections (HCAIs) reflects several of these dimensions, such as missed opportunities for prevention as well as more rational and appropriate use of antibiotics [17].

CONCLUSION

Epidemiological surveillance of infections in the ICU and compliance with hygiene measures are priorities to be included in any program for the control and prevention of nosocomial infections.

Disinfection strategy, guidelines for clinical practice and control charts should be established in each obstetrics care unit to prevent nosocomial infections.

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