OPEN ACCESS
Saudi Journal of Pathology and Microbiology
Abbreviated Key Title: Saudi J Pathol Microbiol
ISSN 2518-3362 (Print) |ISSN 2518-3370 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

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%.

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 cas	Rate (%)
Average age of mother	32,2 years [20-41]
Average gestational age	35 [29 WA - 40 WA]
Indications for hospitalization	
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%

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%.

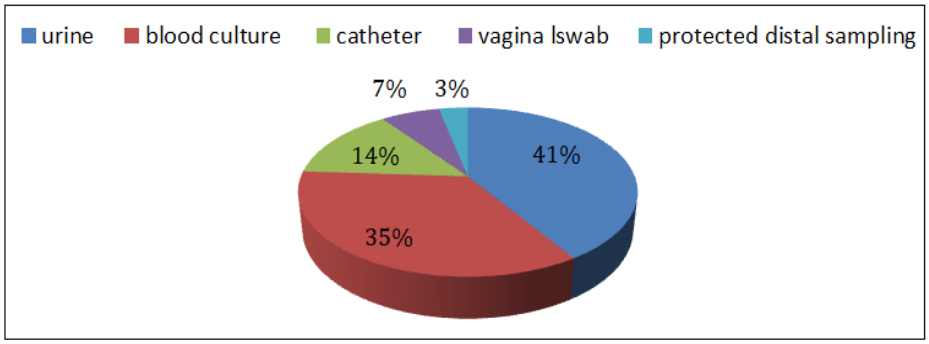

Figure 1: Distribution according to the nature of the sample

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%).

Table 2: culture positivity rate according to the type of sample

	Pourcentage
cytobacteriological examination of urine	88,5%
Blood culture	4,5%
Catheter	5%
Vaginal swab	1%
Low distal sampling	1%

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

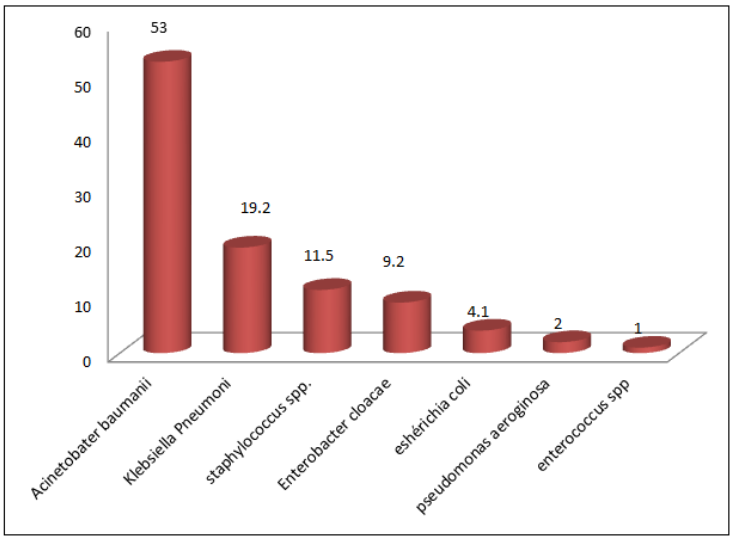

Figure 2: Results of bacteriological identification

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 Betalactamases 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.

REFERENCES

1. Antimicrobial resistance Global report on Surveillance. World Health Organization: France 2014. https:// apps. who. int/ iris/ handle/ 10665/112642. Accessed 10 Aug 2020.
2. Jim O’Neill. Tackling drug resistance infections Globally: Final Report and rceommendations. https:// apo. org. au/ node/ 63983. Accessed 28 Sept 2020.
3. Laxminarayan, R., Matsoso, P., Pant, S., Brower, C., Røttingen, J. A., Klugman, K., & Davies, S. (2016). Access to effective antimicrobials: a worldwide challenge. *The Lancet*, *387*(10014), 168-175.
4. Global antimicrobial Resistance and use surveillance System (GLASS) Report. World Health Organization. Geneva 2020. https:// www. paho. org/ en/ docum ents/ global- antim icrob ial- resis tance- and- use- surve illan cesystem- glass- report- early. Accessed 28 Sept 2020.
5. Bebell, L. M., Ngonzi, J., Bazira, J., Fajardo, Y., Boatin, A. A., Siedner, M. J., ... & Boum, Y. (2017). Antimicrobial-resistant infections among postpartum women at a Ugandan referral hospital. *PloS one*, *12*(4), e0175456.
6. Tadesse, B. T., Ashley, E. A., Ongarello, S., Havumaki, J., Wijegoonewardena, M., González, I. J., & Dittrich, S. (2017). Antimicrobial resistance in Africa: a systematic review. *BMC infectious diseases*, *17*(1), 1-17.
7. Sheldon, T. (2016). Saving antibiotics for when they are really needed: the Dutch example. *BMJ*, *354*, i4192. doi: http://dx.doi. org/10.1136/bmj.i4192
8. Dancer, S. J. (2013). Infection control in the post-antibiotic era. *Healthcare infection*, *18*(2), 51-60.
9. Carlet, J., Jarlier, V., Harbarth, S., Voss, A., Goossens, H., & Pittet, D. (2012). Ready for a world without antibiotics? The pensières antibiotic resistance call to action. *Antimicrobial resistance and infection control*, *1*(1), 1-13.
10. Gastmeier, P. (2010). Healthcare-associated versus community-acquired infections: a new challenge for science and society. *International Journal of Medical Microbiology*, *300*(6), 342-345.
11. Organisation mondiale de la santé. (2008). Prévention des infections nosocomiales guide pratique. 2ème édition. Surveillance des infections nosocomiales; p. 71.
12. Ait El Kadi, M., Aghrouch, M., Seffar, M., Bouklouze, A., Cherrah, Y., Souly, K., & Zouhdi, M. (2006). Prevalence of Acinetobacter baumannii and Pseudomonas aeruginosa isolates resistant to imipenem by production of metallo-beta-

lactamase. *Médecine et maladies infectieuses*, *36*(7), 386-389.

13. Oteo, J., García-Estébanez, C., Migueláñez, S., Campos, J., Martí, S., Vila, J., ... & Red Española de Investigación en Patología Infecciosa. (2007). Genotypic diversity of imipenem resistant isolates of Acinetobacter baumannii in Spain. *Journal of Infection*, *55*(3), 260-266.
14. Koblinsky, M., Moyer, C. A., Calvert, C., Campbell, J., Campbell, O. M., Feigl, A. B., ... & Langer, A. (2016). Quality maternity care for every woman, everywhere: a call to action. *The Lancet*, *388*(10057), 2307-2320.
15. Godlee, F. (2009). Effective, safe, and a good patient experience. *BMJ*, 339, b4346. doi: http://dx.doi.org/10.1136/bmj.b4346
16. Institute of Medicine. (2001). Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academy Press.
17. Dancer, S. J. (2015). Focusing on infection prevention to slow antimicrobial resistance rates. *BMJ: British Medical Journal (Online)*, *350*. doi: http://dx.doi. org/10.1136/bmj.h1931