

Health vigilance concerning bacteremia in neonatology - neonatal intensive care unit at the Mohammed VI University Hospital of Oujda (Morocco): epidemiological profile and antibiotic resistance

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Abstract. The objective of our study was to describe the epidemiological profile of blood culture isolates in the neonatology - neonatal intensive care unit of the Mohammed VI University Hospital of Oujda (Morocco) and to specify the resistance profile of the main germs isolated to antibiotics. This is a retrospective and descriptive study of 21 months from December 14, 2016 to September 14, 2018 and covering all positive blood cultures processed in the microbiology laboratory in accordance with REMIC (reference in medical microbiology) and EUCAST (European Committee on Antimicrobial Susceptibility Testing). Contaminated blood cultures were excluded. As results, we collected 275 positive blood cultures. They occurred in the context of intravascular device (IVD) use in 59% (n=162) of cases. The most isolated bacterial groups were coagulase-negative staphylococci (CNS) 41.45 % (n=114), followed by Enterobacteriaceae 32.36 % (n=89). CNS were resistant to all beta-lactams in 57.89 % (n=66), and to glycopeptides in 5.26 % (n=6). Enterobacteriaceae were producers of extended-spectrum beta-lactamases in 79.77% (n=71) and producers of carbapenemases in 13.48% (n=12) of cases. The alarming increase of enterobacteriaceae isolates and their antibiotic resistance rates should encourage the reinforcement of hygiene measures in our University Hospital.

Introduction

Incomplete inflammatory immune responses make newborns more susceptible to bacterial invasion of the bloodstream, and the risk is even higher in children born prematurely [1]

With improved obstetrical management and the use of antibiotics, early neonatal sepsis is becoming less common. However, it is one of the most frequent causes of neonatal morbidity and mortality in the preterm population. [2]

All newborns with suspected sepsis are evaluated promptly and started on antibiotic therapy before bacteriological confirmation. Early identification of an organism and appropriate antibiotic treatment are essential to prevent increasing mortality and morbidity [3]

The objective of our study was to describe the epidemiological profile of blood culture isolates in the neonatology-neonatal intensive care unit of the

Mohammed VI University Hospital of Oujda (Morocco) and to specify the resistance profile of the main germs isolated to antibiotics

Materials and methods

This was a 21-month retrospective study from December 14, 2016 to September 14, 2018, of all positive blood cultures processed at the Microbiology Laboratory. Contaminated blood cultures were excluded

Blood cultures were performed by peripheral venipuncture or femoral vein and sometimes at the central venous catheter (CVC). A quantity of blood (depending on the weight) is taken and injected into a pediatric blood culture vial (BD Bactec Ped plus vials). After verification of non-compliance, the vials are recorded and incubated in the BD FX 400 automated system for a maximum of 7 days (beyond this period, the microorganisms detected are generally contaminants).

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REMIC recommendations and all the bacteremias we have isolated are true.

In our work, CNS is the most isolated group of bacteria from positive blood cultures (n=114; 41.45%). These results are in agreement with the data reported by a study in Turkey over a period of 7 years [6] and a study in Iran over a period of one year [7].

BGN bacteremia remains largely dominated by *Klebsiella pneumoniae* as found by national and international authors with variable rates [8-11]. In our study 20.36% (n=56) of *Klebsiella pneumoniae*

Abaumannii is the species that occupies the third position after *klebsiella pneumoniae* with a rate of 10.9% (n=30). This frequency of isolation is discordant with the study of Hilal Ozkan reporting a rate of isolation of 3.31% [6]

Resistance profile

The susceptibility of germs to antibiotics depends on the epidemiological situation of each hospital and the microbial ecology of each facility. The severity of neonatal infections in the intensive care setting is largely due to the multidrug resistant of the bacteria involved. The selection pressure linked to the antibiotic treatments administered and the existence of a genetic support in the environment allowing the selection of resistant strains are important factors in the evolution of antibiotic resistance [12].

SCN its profile was marked by a high resistance to meticillin, of the order of 100%, 80%, respectively in Peru [13] and France [15], In our study, the rate reached 57.89% (n=66) of SCN strains

In our study, 96% of isolated *Klebsiella pneumoniae* strains were ESBL producers. This is in agreement with what is reported by Heloise Buys 86 % [15].

In our work, 73% (n=22) of *A. baumannii* strains were resistant to imipenem. A higher rate was reported in the study of M. Lemsanni in Marrakech (90%) [10] and a lower rate in a study conducted in Turkey by OZDEMIR at 53.3% [16].

Conclusion

The alarming increase of enterobacteriaceae isolates and their antibiotic resistance rates. This should encourage the reinforcement of hygiene measures within our university hospital.

It is therefore necessary to have a collaboration between clinicians and biologists to identify this problem and limit the emergence of new resistant strains.

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