Summary and Conclusion

The increasing frequency and the high mortality associated with neonatal sepsis have underscored the importance of rapid detection of pathogen. Klebsiella pneumoniae and Staph epidermidis account for the vast majority of neonatal sepsis, approximately (29.55%).

Accurate clinical diagnosis of neonatal sepsis is often difficult, as signs and symptoms in the neonate may be subtle or vague. Currently, blood culturing is considered to be the gold standard for diagnosing neonatal bacterial sepsis. However, even blood culturing techniques can have unacceptably low sensitivities. The reasons for this include intermittent seeding of low numbers of bacteria within the blood stream, the extremely small blood volumes obtained from infants for culturing, and increasingly common practice of providing intrapartum antibiotics to mothers of high –risk deliveries.

Molecular techniques such as PCR have been used successfully to detect a wide range of organisms, including bacteria, yeast, viruses and protozoa. Unlike culture, these types of assay do not require growth of an organism for detection. This technology has proven to be quite useful in diagnosing nonculturable pathogens like human parvovirus B19or human papilloma virus, and has the potential for excellent sensitivity, and a shorter turnaround time than those of culture –based protocols.

Prompt detection and accurate speciation may help to improve neonatal sepsis management as a whole and lead to more rational use of antibiotic. Traditional identification methods based on phenotypic features are often time consuming and depend largely on the skill and experience of the technician.

This study was designed to evaluate the abilities of non –culture based methods (PCR for detection of neonatal bacteremia and DNA sequencing for identification of the causitive pathogens) and to compare their results with those obtained by conventional method (Blood culture and conventional phenotypic identification).

Fifty neonates with symptoms and signs suspecting neonatal sepsis (Respiratory distress, depressed reflex, cyanosis, areflexia, dyspnea, lethargy, and tonic convulsion) were included in this study. There were 34 male, and 16 female.

In this study, 43 out of 50 patients (86%) were positive for bacteremia by blood culture while, 44 out of patients (88%) were positive by PCR.

The most commonly isolated organisms detected by DNA sequencing were Staph.epidermidis and Klebsiella pneumoniae (29.55%)for each, followed by Staphylococcus aureus (20.45%), then E coli and Streptococcus agalactia (4.55%) for each, and Acenitobacter lwoffii, Acenitobacter baumannii, Citrobacter freundii, Pseudomonas aeruginosa, and Enterobacter gerjerviane (2.27%) for each.

Considering blood culture as a reference method, the sensitivity of PCR was 100%, while specificity was 75% after exclusion of Candida isolates which need 18 S r RNA not 16 S r RNA for its detection.

Blood culture method took the most time to detect sepsis (up to 5 days) while PCR took less time (4 hours).

It can be concluded from this study that:

- The diagnosis of neonatal sepsis often difficult, as signs and symptoms in the neonate may be subtle or vague, most infants with septicemia present with non specific signs and symptoms.

- The traditional blood culture techniques remain the initial procedure of choice for identification of clinical neonatal sepsis.
- Microbact 12A test may be useful tool for use in routine identification of isolated oxidase negative, nitrate positive, glucose fermenter Gram negative bacilli, due to its ease of sitting up and reading, and its performance but with prolonged incubation time from (24-48 hour).
- PCR is superior to conventional methods for the diagnosis of sepsis provides accurate and reproducible method that combines the enhanced sensitivity and increased specificity, and it is clearly advantageous regarding speed and fulfills the need for rapid identification.
- DNA sequencing has clinical relevance, it represent a very different approach compared with traditional methods, that it provides qualitative discrete sequence data that are invariable over time and space, the technique can be applied to all bacteria and, depending on region and length of sequenced string. Classification, identification of species or even subtyping of the particular isolate can be achieved.
- Concerning the time consumed to diagnose sepsis; blood culture technique took more time and PCR took less time.