Resistant bacteria in children with community-acquired febrile illness in a tertiary hospital in Nigeria

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Abstract

Background: Blood bacterial infection is a cause of serious illness in children, especially the antibiotic resistant organisms. Since there is variation in the causative organisms with different location, there is need to determine the burden in our location aside the low data recorded. This study determined prevalence of bacteraemia, resistance pattern of implicated organisms and the role of Procalcitonin (PCT) in children with Community Acquired Bacteraemia (CAB) at a tertiary hospital in Nigeria. It is to enhance focus on antibiotic stewardship in clinical practice.

Methods: Children clinically suspected to have bacteraemia at presentation during 13 months of the period of study were recruited. Their blood samples were cultured and assayed for serum procalcitonin. Antibiotic resistance was determined on isolated bacteria, and polymerase chain reaction was used to confirm implicated genes. The data generated were analyzed using appropriate descriptive and inferential statistics.

Results: A total of 343 children ≤ 14-years were evaluated, and 94 (27.4%) had bacteraemia. The most common organisms were Staphylococcus aureus (n=66; 70.2%), Stenotrophomonas maltophilia (n=7; 7.4%), and coagulase negative staphylococci (n=6; 6.4%). More than fifty percent of all the isolates were multidrug-resistant. Twenty-one of 21 Staphylococcus aureus had mecA gene and three Gram-negative isolates had at least one of blaCTX-M/blaSHV/blaTEM genes. Elevated serum procalcitonin level was significantly associated with bacteraemia.

Conclusion: Nearly 30% of children suspected with bacteraemia in the studied population had positive blood-culture. The most isolated pathogen was Staphylococcus aureus; and a third of the pathogens were multi-drug resistant. Procalcitonin assay is useful in excluding bacteraemia in febrile children. Resistant bacteria pathogens are not uncommon in the community.

Sampling

All patients with febrile illness suspected of having a community acquired bacteremia, based on pediatrician assessment, were recruited. Children with diagnosis not related to sepsis, those admitted for more than 48 hours before developing fever, children who were discharged from hospital and re-presented with fever within 48 hours and children whose parent (s) or guardian (s) did not give consent were all excluded from the study. Demographic information and clinical details of each patient was recorded on forms specific for this study. The venipuncture site was cleaned with 70% alcohol and povidone-Iodine, then one to three milliliters of venous blood were drawn and introduced aseptically into two blood culture bottles (by BD PeadPlus bottle; Becton Dickinson). Also, three drops of plasma were added into the well of procalcitonin rapid diagnostic kit (Strong Step ® PCT Rapid Test).

Processing

The PCT rapid kit was read after 15 minutes and interpreted based on the manufacturer recommendation. Readings >0.5 were taken as a case of sepsis. The blood culture samples were incubated using the BD Bactec™ 9050 Blood Culture System; Becton Dickinson. The Gram-negative organisms were identified with morphology, microscopy and Microbact GNB 24E, identification kit by Oxoid, while Gram-positive organisms were identified with morphology, microscopy, catalase, coagulase and optochin testing.

Biography

It have more than 15 years of experience in medical and Pharma (incl. targeted therapy or immunotherapy) as well as other fields.