SHORT COMMUNICATION

O-3. EPIDEMIOLOGICAL STATUS OF EXTENDED SPECTRUM BETA-LACTAMASE PRODUCING *Klebsiella pneumoniae* IN SUB-SAHARIAN AFRICA (MALI) IN INTERNATIONAL ADOPTION

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Key words
ESBL, adoption, Klebsiella pneumoniae, CTX-M-14

Introduction

The purpose of the current study was to look for the carriage of ESBL producing Klebsiella pneumoniae in international adoption. This medical supervision program was brought after serious infection in adopted children. A previous study showed contamination in Bamako orphanage (1). So, since 2001, all children adopted from the state orphanage of Bamako (Mali) were examined by a paediatrician within the first week of their arrival at the outpatient adoption practice of the Paediatrics Department of Brest University Hospital, France. Stools samples were collected from all adopted children and their family members at the first visit and every month after and sent to the microbiology laboratory for analysis. The follow up of each patient was stopped when stool samples were negative three months consecutively.

Materials and Methods

ESBL-producing Klebsiella pneumoniae were subtyped by pulsed-field gel electrophoresis (PFGE) and tested for antimicrobial susceptibility; Isoelectrofocusing analysis permitted to class ESBL-K.p. isoelectric points. Specific antimicrobial resistance genes were characterized using a polymerase chain reaction (PCR) assay with specific primers for three antimicrobial resistance genes. PCR products were purified and determined by sequence analysis.

Results

Over a period of 48 months, 47 ESBL-Klebsiella pneumoniae were isolated for fecal samples supervision and tested for susceptibility using the double disk diffusion test on 15 families which has adopted a child. The mean age of the children carrying ESBL-Kp at the entrance in France was 3 months. Clinical data were available for all the children. Seven (47%) were healthy carriers whereas infections were seen in eight. The mean duration of ESBL-Kp carriage was four months (1 to 11 months).

According to the zone diameters by diffusion disk, 3 phenotypes could be distinguished: 7 strains had a CAZ diameter larger than CTX diameter suggesting a CTX-M enzyme. 27 strains had a CTX diameter larger than CAZ diameter and 13 had similar zone diameters.

PFGE showed 24 genotypic profiles for Klebsiella pneumoniae demonstrating a large polymorphism. All 47 isolates produced ESBL. PCR and DNA sequencing revealed that isolates harbored a blaSHV-2a and a bla TEM-1 gene while others carried a blaTEM-1 and a blaCTX-M-15 genes. One child had CTX-M-14. (Figure 1)

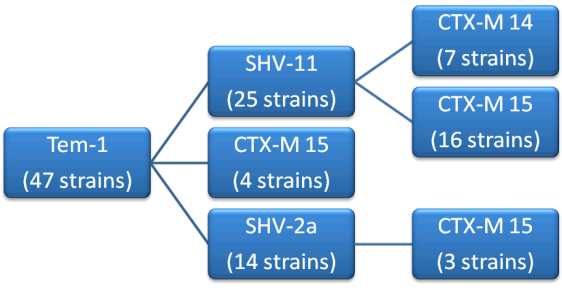

Figure 1: Distribution of different ESBL-producing Klebsiella pneumoniae

Discussion

Multiresistant bacteria are a real public health problem (morbidity, mortality, cost) because of their increasing highly incidence. When EESBL were emergent, the most preponderant specie was Klebsiella pneumoniae with especially hospital epidemy. And now, out of hospital, these enzymes spread dramatically. In our study, six ESBL-K.p. were identified such as TEM-1, SHV-11, SHV-2A, CTX-M-14, and CTX-M-15 with the first report of CTX-M-14 in Sub-Saharan Africa. Concerning the duration of the carriage, it varied from 1 to 11 months with an average in 4 months. Longer the duration of the carriage is, higher is the risk of transmission in family circle and in subjects contacts. However, during the family survey program, no ESBL-producing K.p. was isolated except from the adopted child. Therefore, the intra-family transmission of these bacteria is not likely to be a frequent phenomenon. However, in a previous study, we showed that intra-family transmission for E.coli and for Salmonella enterica Babelsberg could occurred in families which had adopted children of the same orphanage (2). The misuse of antibiotics and deficient measurements of hygiene explained presence and spread of such multiresistant bacteria in orphanages. The problem of multi-resistance implicates that therapeutic alternatives are very restricted. The cotrimoxazole which remains a very used molecule in developing countries is resistant in our study in 94 % of cases.

Conclusions

This is the first report of CTX-M-14 in K.p. in Sub-Saharan Africa, and particularly in adopted children from Mali. Further to emerging multiresistant bacteria, a national survey program of adopted children coming from emergent countries seems to be a measure that should be offered in a systematic manner during their arrival. A screening searching ESBL-producing enterobacteriae could be performed at these children and recommended for their families of adoption.

Acknowledgements

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References

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