

STUDY OF RESISTANCE PHENOTYPES AND β -LACTAMASES GENOTYPES IN ENTEROBACTERIACEAE STRAINS IN CHILDREN WITH ACUTE DIARRHEA SYNDROME

P.I.Calistru*, M. Nica**, I.L.Apostol*, M. Damian***, C. Popescu**, A.G.Kosa*, C. R. Usein***

**Dr V. Babes Foundation-FVB, **Dr V. Babes Clinical Hospital for Infectious and Tropical Diseases-SVB,

***National Institute Cantacuzino-INCDMIC

BACKGROUND & OBJECTIVE

-In our geographic area bacterial strains with decreased sensibility to β -lactams have been selected in the last years.
-Our objective was the identification of the *Enterobacteriaceae* resistance phenotypes and β -lactamases genotypes from bacterial strains isolated in Dr Victor Babes Hospital, Bucharest (SVB), over Feb 1st-Aug 31, 2009.

MATERIAL & METHOD

-Subjects: children 0-4 years presented with acute diarrheal syndrome to the SVB; stool samples were collected in the first day of hospital admission and processed by classical microbiological tests- **Standard stool cultures** for *Enterobacteriaceae* isolation.
-Resistance phenotype detection: **standard diffusimetric method** (CLSI 2009, *E. coli* ATCC 25922) used for antibiotic sensitivity testing; **double disk diffusion** for ESBL screen
- β -lactamases genotype detection: **bla genes through PCR detection, DNA sequencing using ABI Avant 3100 system**; the programs **BioEdit and BLAST** was used for results interpretation.

RESULTS

There were isolated 67 bacterial strains from 884 subjects. The etiologies were: verotoxinic *E. coli*/ VTEC/6 strains; enteropathogenic *E. coli* /EPEC/18; *Salmonella* BO/10; *Salmonella* DO/9; *Salmonella* CO/4; *Shigella flexner*/3; *Shigella sonnei* "S"/ 2; *Klebsiella pneumoniae*/9; others/6.

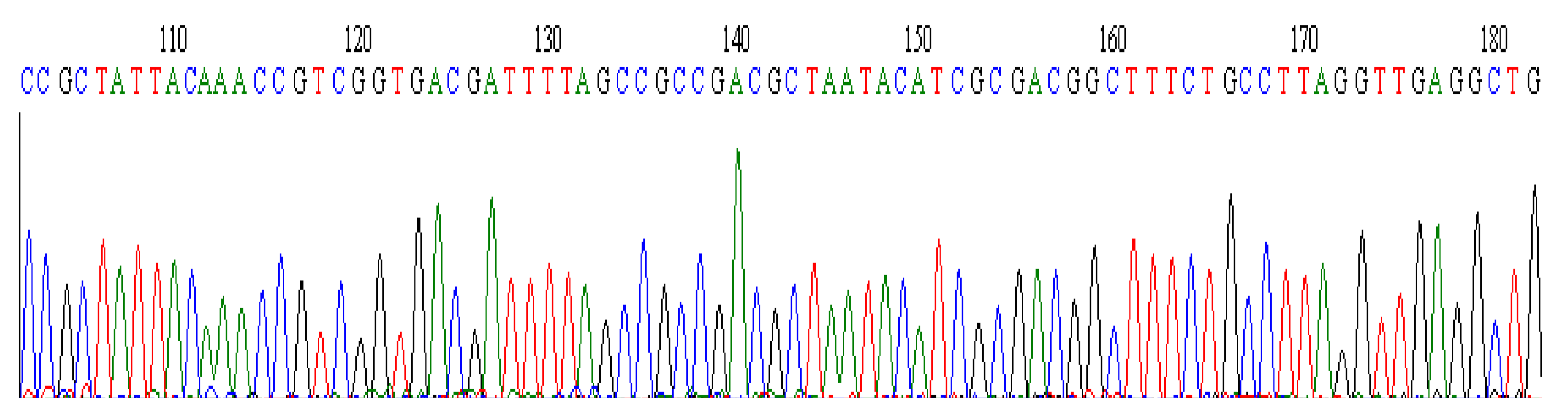
Resistance patterns were: 3/23 *Salmonella* at ampicillin, 1 *Shigella flexneri* ESBL (+) , 12/24 *E. coli* (EPEC,VTEC) at ampicillin, 1 EPEC ESBL (+) , 5/9 *Klebsiella pneumoniae* ESBL (+) .

The resistance genotypes were analyzed in 9 strains (*E. coli*/2, *K. pneumoniae*/7) : *bla*TEM 1/ one single type; *bla* SHV 1, 11, 14/ three variants, *bla* CTX-M 3, 15/ two alleles. In *E. coli* was identified the association of *bla*TEM1 and *bla* CTX-M 15 and in *Klebsiella pneumoniae* we have found: *bla* TEM 1/ 7, *bla* SHV 1 / 3, *bla* SHV 11 / 3, *bla* SHV 14 / 1, *bla* CTX-M 3 / 2, *bla* CTX-M 15 / 5.

Table 1. β -lactamase types identified in *Enterobacteriaceae* intestinal isolates

Species	<i>bla</i> TEM (no of positive isolates)	<i>bla</i> CTX-M (no of positive isolates)
E. coli	TEM1 (2)	CTX-M 15 (1)
K. pneumoniae	TEM1 (7)	CTX-M 3 (2) CTX-M 15 (5)

Figure 1. Electropherogram associated to the amplicon *bla*CTX-M sequence of *E. coli* ESBL(+)



CONCLUSIONS

-A number of 23/67 strains have a resistance phenotype to one β -lactam and the 9/67 strains have more *bla* genes.
-The strains carrying *bla* CTX-M are concomitant *bla* TEM1 carrier.
-Antibiotic resistance of *Enterobacteriaceae* isolates can be a trait of infectious agent as important as its intrinsic virulence.

REFERENCES

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