

Escherichia coli pathotypes and *Shigella* sero-groups in diarrheic children in Nairobi city, Kenya.

Abstract

Aim:

In the present study, we investigated the prevalence of *E. coli* pathotypes and *Shigella* sero-groups and their antimicrobial profiles among diarrheic children in Nairobi city, Kenya.

Background:

Although diarrheagenic *E. coli* pathotypes and *Shigella* sero-groups are leading causes of diarrhea in children under five years in developing countries, their distribution and antimicrobial resistance vary from place to place and over time in a given region.

Methods:

In a cross-sectional study, we enrolled diarrheic children (n=354) under five years seeking treatment at Mbagathi Hospital, Nairobi city, Kenya,. Stool samples were collected from all children for bacterial culture. Bacterial isolation and identification was performed by conventional microbiological methods. Polymerase chain amplification was used to detect aspU, aggR, andpcvd432 for EAEC, est and elt for ETEC, eae for EPEC, stx for EHEC, and ipaH for EIEC and *Shigella* species. Antimicrobial profile was determined by disk diffusion method.

Results:

The prevalence of EAEC, ETEC, EPEC (eae), EIEC (ipaH) was 21.2%, 10.5%, 4.5%, and 0.6%, respectively, while that of mixed infection was 0.6% for ETEC/EAEC and 0.3% for EAEC/EPEC/ETEC. No EHEC strain was isolated. Pathogenetic analysis for EAEC showed that 5.9% carried aspU, 8.2% possessed both aspU and aggR and 7.1% had a combination of aspU, aggR and pcvd432 while that of ETEC was 2.3% for elt, 6.5% for both elt and est and 1.7% for est. The combination of aspU with aggR, elt and est, and pcvd432 with aggR, aspU and est was 0.3% for each case of ETEC/EAEC mixed infection. The aspU gene co-existed with aggR, pcvd432, eae and elt in the EAEC/EPEC/ETEC mixed infection. The prevalence of *S. boydii*, *S. dysenteriae*, *S. flexneri* and *S. sonnei* was 0.8%, 0.6%, 1.7%, and 0.8%, respectively. No *E. coli* pathotype and *shigella* co-infection was detected. In addition, both *E. coli* pathotypes and *Shigella* species were resistant to ampicillin, trimethoprim/sulfamethoxazole, streptomycin, chloramphenicol and tetracycline while gentamycin and kanamycin resistance occurred in diarrheagenic *E. coli*.

Conclusion:

E. coli pathotypes and *Shigella* sero-groups harboring virulent genes are important causes of diarrhea in children in Kenya. The increasing spectrum of antibiotic resistance in diarrheagenic *E. coli* and *Shigella* species necessitates the development of antimicrobial stewardship education-programs to influence prescribing behavior as well as optimizing the use of effective antimicrobials in Kenya.

Key Words: *E. coli* pathotypes, *Shigella* sero-groups, Antimicrobial profile.

Authors

[Peter Lokamar Nyanga](#), [Jackson Onyuka](#), [Mark Kilongosi Webale](#), [Tom Were](#), and [Valentine Budambula](#)