

Plasmid Fingerprinting for the Investigation of Inter-household Spread of Multiresistant Faecal Bacteria in Rural Bangladesh

Kazi Selim Anwar¹ and Paul Shears²

Objective: Determine the household spread and epidemiology of multiple drug-resistant (MDR) faecal coliform bacteria from human and environmental sources employing plasmid fingerprinting.

Methodology: Thirty-three water specimens of *kolshi* (storage pot), 13 tubewell and 71 faecal samples were collected from 17 randomly selected households of two villages of Rajbari. Lactose-fermenting coliforms (LFC) were cultured, and MDR strains, after antibiogram (Stokes, 1972), were subjected for *in vitro* conjugation. Plasmid from donor LFCs and their transconjugants were extracted following the method of Boimboim and Doly. Restriction endonuclease (REA) fragments were generated by digesting the large 98 Mda transconjugant plasmid using *HindIII*. Dendrogram was also employed to compare its findings with the conventional (manual) plotting method.

Results: Ninety-four percent of the faecal samples, 21 of the 33 *kolshi*, and only two of the tubewell samples were contaminated with LFC. Overall, 78% of the isolates were resistant to more than 3 antibacterials; R-pattern 'RRRSS' genes [(resistant to tetracycline (Tc), ampicillin (Am), and trimethoprim (Tm), and sensitive to chloramphenicol and nalidixic acid (Na)] were the commonest and prevalent in all types of samples and from almost every household. Conjugation experiment showed a complete transfer of 'RRRSS' genes which were carried most commonly by a large 98-Mda plasmid, although not all of these were genetically identical as revealed by REA. However, similar or different plasmid/transconjugant/REA profiles were observed in the same or different households or *baris* (cluster of households) of both the study areas.

Conclusion: It was evident that a wide range of MDR LFCs (as a marker of *Enterobacteriaceae*) was circulating in both the villages, within the households and among different *baris*. Water from *kolshi*, but not from tubewell, played a vital role in the household spread of these bacteria.

¹Institute of Public Health, Mohakhali, Dhaka 1212, Bangladesh

²Centre of Tropical Medical Microbiology, Duncan Bldng (8th floor), Liverpool University, L3 5QA, England, UK



Efficacy of Erythromycin, Ampicillin, and Tetracycline in the Treatment of Cholera in Children

SK Roy, A Islam, R Ali, E Islam, RA Khan, SH Ara, NM Saifuddin, and GJ Fuchs

Objectives: Compare the clinical outcome(s) of treatment of cholera in children with ampicillin, erythromycin, and tetracycline.

Methodology: In a double-blind randomized 4-cell trial, 184 children aged 1-5 years whose weight-for-age was more than 80% of the NCHS standard were given either tetracycline, erythromycin, ampicillin, or placebo for 3 days (the dosage suggested by the World Health Organization) in a diarrhoeal disease hospital in Dhaka. Selection criteria included diarrhoea of less than 48 hours duration, signs of some or severe dehydration, a dark-field stool microscopy demonstrating the presence of *Vibrio cholerae* and baseline purging rate more than 4 mL/kg/h (over 6 hours).

Results: After three days of antibiotic treatment, the mean \pm SEM stool output was significantly reduced in each of the three groups who received antibiotics compared to the placebo group. The mean duration of recovery was 66%

longer in the placebo group ($p=0.000$), 25% in the ampicillin group ($p=0.017$), and 9% in the erythromycin group ($p=0.37$) compared to the tetracycline group. The clinical recovery rate by 96 hours was 75% ($p=0.001$) in the placebo group, 91.3% in the ampicillin group ($p=0.16$), and 95.7% in the erythromycin group ($p=0.04$) compared to the tetracycline group. The stool output in mL.kg.body weight was: 318 ± 50 , 335 ± 30 , 323 ± 25 , and 498 ± 37 respectively in tetracycline, ampicillin, erythromycin, and placebo groups.

Conclusion: The results of the study indicate that the clinical efficacy of tetracycline, ampicillin, and erythromycin in the treatment of cholera in children was comparable. It is recommended that, where test for *V. cholerae* is positive to ampicillin, it can be used as an effective alternative antibiotic for the treatment of cholera and acute respiratory tract infections.

International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), GPO Box 128, Dhaka 1000, Bangladesh



Desire for Children and Subsequent Abortion in Matlab, Bangladesh

Abdur Razzaque, Kapil Ahmed, Nurul Alam, and Jeroen van Ginneken

Objective: Investigate the desire for children and subsequent abortion in the MCH-FP and comparison areas of Matlab, Bangladesh.

Methodology: Data of the in-depth survey 1984, KAP survey 1990, and the Demographic Surveillance System (1984-1994) were used.

Results: During 1984-1994, the incidence of abortion increased substantially in both comparison and intervention areas, and such increase was due to those who wanted no more children. After controlling for all the variables in the logistic regression, the probability of subsequent abortion was higher among those who wanted no more children than those who wanted more in both MCH-FP (5.2 times) and comparison (8.9 times) areas. The incidence of abortion was lower in the MCH-FP area than that in the comparison area and was lower among the illiterates, users of contraception, and the Muslims in both the areas compared to the educated, non-users of contraception, and the Hindus.

Conclusion: The findings of the study suggest that there is a need to improve the quality of family planning services, particularly for those who want no more children to reduce abortion and abortion-related deaths.

International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), GPO Box 128, Dhaka 1000, Bangladesh



Implementation of the Essential Services Package through Standardized Service Delivery Protocols

Selina Amin¹, Cristobal Tuñón¹, SE Arifeen¹, AH Baqui¹, Rasheda Khanam², and Samina Manaf¹

Objective: Evaluate the range and quality of services delivered from the urban primary-care clinics through the adaptation and implementation of appropriate and practical service delivery protocols.