EXTENDED SPECTRUM BETA LACTAMASE (ESBL) PRODUCING ESCHERICHIA COLI AND KLEBSIELLA PNEUMONIAE IN DIABETIC FOOT INFECTION

Dear editor,

Trauma, leading to infection is a common sequel of diabetic foot ulceration, which, once established, progressively worsens and becomes more difficult to treat. Extended spectrum β-lactamases (ESBLs) are the derivatives of common β-lactamases (TEM and SHV β-lactamases) that have undergone one or more amino acid substitutions near the active site of the enzyme, thus increasing their affinity and the hydrolytic activity against third generation cephalosporins and monobactams.[1] Production of ESBL enzymes is either chromosomally mediated or plasmid mediated.[2] The majority of ESBL producing strains are Klebsiella pneumoniae, Escherichia coli and Klebsiella oxytoca.[3] This study was carried out to find out ESBL producing E.coli and K.pneumoniae in diabetic foot infection with type 2 diabetes mellitus and the clinical outcome of these patients.

Over a one year period from January-December 2006, 191 samples (tissue 116, wound swab 75) were collected from indoor patients admitted at S.L. Raheja Hospital, tertiary care hospital for diabetic patients. Patients with non-healing diabetic foot ulcers for two weeks with empirical antibiotic treatment were included in the study. The samples were processed, identified and tested for antibiotic sensitivity test based on standard laboratory technique according to Clinical and Laboratory Standards Institute (CLSI) guidelines[3] with commercially available discs (Hi Media) on Muller Hinton agar plates.

ESBL producer was identified if there was ≥5 mm increase in zone diameter of ceftazidime/clavulanate disc than that of ceftazidime disc alone. Escherichia. coli ATCC 25922 was used as negative control.

From 43 E.coli isolated, ESBL production was observed in 46.51% whereas from 27 K.pneumoniae isolated, ESBL production was found in 44.44%. Maximum ESBL producers were isolated from tissue samples. A combination of carbapenem, amikacin and piperacillin/tazobactam was given to the patients. The mean hospital stay for the indoor patients was 20 days. There was no mortality associated with this infection.

There is paucity of Indian data on the ESBL producing pathogens in diabetic foot infection. In a study conducted in 2001, the prevalence was only 6% amongst E.coli isolates.[4] Kapil et al, have reported 54.5 % E.coli isolates to be ESBL producers.[5] We report overall 46.51% E.coli and 44.44% K.pneumoniae isolates to be ESBL producers.

Thus, the prevalence of ESBLs among members of Enterobacteriaceae constitutes a serious threat to current beta-lactam therapy leading to treatment failure in diabetic foot infection.

References
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Dear editor,

Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV) and syphilis share certain epidemiological characteristics. In the post highly active antiretroviral therapy (HAART) era, life expectancy of patients with HIV has increased and the focus has now shifted to the management of concurrent illnesses such as chronic HBV and HCV infections, syphilis and other co-infections which have the potential to increase long-term morbidity and mortality.

Bangladesh currently has very low rates of HIV infection and unfortunately there is no existing information on the prevalence of HBV, HCV and syphilis co-infections among the HIV patients. Therefore, the Department of Virology, Bangabandhu Sheikh Mujib Medical University (BSMMU) and Armed Forces Institute of Pathology (AFIP) Dhaka; two referral centres for HIV/AIDS in Bangladesh, conducted a study on 118 preserved sera of HIV patients (age range 19 months to 58 years, average 31.24 years, 79 males and 39 females) from January 2005 to May 2007. The prospective blood donors (13,500) tested for HCV and HBV during the same period of time in AFIP were regarded as control group.

We found that, the overall prevalence of co-infections in HIV patients was 18.64% (22/118) and with hepatitis viruses alone it was 5.93% (7/118, all male). Triple infection with HIV, syphilis and HCV was detected in one patient only. The rate of detection of HBsAg was higher (4.24%, 5/118) in HIV positive patients than the control group (0.84%, \(<P<0.001\)), which indicates that the prevalence of HBV in HIV patients is more than the general population of Bangladesh but below the rate found in Western (16%) [1] and Northern India (5.3%). [2] The presence of anti-HCV among HIV patients was 1.69% (2/118) which is statistically significant (\(<P<0.05\)) when compared with the control group (0.08%). This rate was lower than the rate found in Thailand (7.8%) [3] and Western (30%) [1] and Northern India (2.43%). [2] Though we could not calculate the statistical significance of prevalence of syphilis in the study population due to lack of data in control group, Syphilis was the highest prevalent disease (16/118; 13.55%, 9 males and 7 females) among the HIV positive individuals. This rate was lower than the rate found among the sexually transmitted diseases (STD) suspected clinic attendees of Argentina (59.7%).[4]

Liver disease due to chronic HBV and HCV infection is becoming a leading cause of death among persons with HIV infection worldwide. Therefore, it would be advisable to detect hepatitis virus co-infections in these patients at the earliest. Syphilis like genital ulcerative STDs provides great opportunity of transmission of HIV. As there is a risk of false-negative serology in syphilis, it is suggested that all HIV-positive patients should be treated with a penicillin based regimen.[5] Also, patients presenting with syphilis should be offered HIV testing and vice versa. The higher rate of syphilis co-infection in HIV patients of Bangladesh emphasises the need of integrated HIV/STD intervention programs and effective surveillance system. The main limitation of this study was the lack of information about risk behaviours of the study subjects. However, we believe that these results will help to implement universal screening for syphilis, Hepatitis B and C viral infections in all HIV patients of Bangladesh.

References


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