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Rapid changes in antibiotic sensitivity and resistance among pathogenic bacteria isolated from clinical samples in two hospitals in Dhaka City, Bangladesh

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Background: It is established that improper use of antibiotics leads to rapid development of bacterial antibiotic resistance. How the conditions affect the change of antibiotic sensitivity over time is less investigated. We investigated changes in antibiotic sensitivity of pathogenic bacteria in a megacity where improper antibiotic use is common.

Materials & Methods: Data on the percent of clinical isolates sensitive or resistant to 28 commonly used antibiotics was obtained from two large hospitals. Changes in drug sensitivity of the isolates at time point A and at about three years later (i.e. time point B) were compared using a one-sided test for equality of proportions. For large samples, tests using Z-score and normal distribution were conducted; for small samples, Fisher's exact test was performed.

Results: The antibiotic sensitivity of 194 different pairs of isolate-clusters were compared. Of them 66.5% of the cluster-pairs showed no change. The time point B isolate-clusters showed a significantly lower sensitivity in 21.1% of the cases, and a significantly higher sensitivity in 12.4% of the cases, when compared to the corresponding time point A clusters. The decreased sensitivity was observed in 20.0% of the Gram-negative and 24.1% of the Gram-positive bacterial isolate clusters; and the increased sensitivity was observed in 10.0% of Gram-negative and 18.5% of Gram-positive bacterial clusters.

Conclusions: Bacterial antibiotic resistance and sensitivity may change significantly over a period of three years. Continuous vigilance on bacterial antibiotic sensitivity may keep effective and affordable antibiotics clinically relevant.

Biography

Ruhul H Kuddus is a professor of Biology at Utah Valley University. He teaches Clinical Microbiology, Molecular Biology and Immunology. He has a diverse research interest. Data presented here was collected at Dhaka Bangladesh in 2011-12, when he served there as a Fulbright Scholar and a Visiting Professor at University of Dhaka, Dhaka, Bangladesh.

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