Prevalence of Multidrug Resistant Zoonotic Bacteria in Poultry of Bangladesh

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Abstract: Zoonotic bacterial pathogens are directly transmissible from animals to humans. Food producing animals can serve as reservoirs of antibiotic resistant organisms (and their genes) through extensive veterinary use of antimicrobials. This is an especial concern in Bangladesh because of concurrent use of antibiotics in the poultry feed, irrational usage of antimicrobials in disease treatment, unhygienic practice in farming and marketing. The study investigated zoonotic pathogenic bacteria involved in poultry on the basis of serotypes, resistotypes, and genotype. The study was extended towards the drug resistant profile against 15 major groups of common antibiotics, and molecular characterization of possible zoonotic bacteria from poultry samples in Bangladesh. The prevalence of *Salmonella* was found to be 21.1% along with various *Enterobacter* spp. which was the second dominant bacteria isolated from poultry. A large number of plasmid-free *Salmonella* and *Enterobacter* isolates were found to be resistant to 10-15 groups of antibiotics. Some of these multidrug resistant (MDR) isolates also depicted typical phenotype for the presence of extended spectrum beta lactamase (ESBL) production. Antibiotic resistance encoding genes such as *VanA* for vancomycin resistance and *tem*, *ctx-M* and *shv* for ESBL production, were also detected within the isolates genetic fingerprinting methods and corresponding sequencing of 16S rRNA gene of representative isolates, detected close similarity to *Salmonella*, *Typhimurium*, *S. Enteritidis*, *S. Paratyphi*, *Enterobacter cloacae* and *Enterobacter hormaechei* within the poultry samples indicating significant zoonotic hazard. The prevalence of MDR-ESBL isolates in poultry along with their zoonotic relevance implicates that the poultry sector in Bangladesh is at serious risk of zoonotic disease transmission. This may have a negative impact on the bulk economy of Bangladesh.

Key words: Prevalence, multidrug resistance bacteria, zoonosis, poultry and Bangladesh.