CRIMSON PUBLISHERS
Wings to the Research

Approaches in Poultry, Dairy & Veterinary Sciences

ISSN: 2576-9162

Mini Review

Role of Veterinary in the Development of Antibiotic Resistance

Asima Zehra*

Department of Veterinary Public Health and Epidemiology, Guru Angad Dev Veterinary and Animal Sciences University, India

***Corresponding author:** Asima Zehra ,Department of Veterinary Public Health and Epidemiology, Guru Angad Dev Veterinary and Animal Sciences University, Punjab, India; Email:assimazehra@gmail.com

Submission: June 01, 2018; **Published:** July 11, 2018

Mini Review

Without exception, an estimated 50% of all antimicrobials serve veterinary purposes all over the world. Bacteria that inescapably develop antibiotic resistance in animals encompass food-borne pathogens, opportunistic pathogens and commensal bacteria. The accumulation of resistant bacteria by the use of antibiotics in veterinary medicine and the spread of such bacteria via veterinary medicine are still being discussed. Available epidemiological methods alone are often insufficient to accurately describe the relationships between veterinary antibiotic use and resistance [1]. Therefore, the veterinary contribution to human antibiotic resistance remains uncertain, with opinion ranging from globally negligibleor irrelevant to one of major concern [2].

The increase in the antibiotic-resistantbacteria has been ascribed to the indiscriminate use of antimicrobials in veterinary, agriculture and human medicine. The addition of veterinary medicine as a reason for the development of antibiotic resistance in the human population is still in debate. The veterinary use of antibiotics comprises the use of pets, farm animals and animals raised in aquaculture. For farm animals, antibiotics are used in therapy and prophylaxis, and as a feed additive for growth promotion. The main infectious diseases treated are enteric and pulmonary infections, skin and organ abscesses and mastitis. Antibiotics used in both veterinary and human medicine are aminoglycosides, cephalosporins, macrolides, lincosamide, penicillins, quinolones, sulfonamides, trimethoprim, tetracyclines, chloramphenicol, spectinomycin, nitrofurans, nitroimidazoles, and polymyxins [3]. The application of antibiotics at sub-therapeutical levels for increased growth and feed efficiencies in farm animals (cattle, swine, sheep, goat, and poultry), an assimilated part of modern agriculture worldwide, is highly contentious.

The following antibiotics are approved for those two purposes in India: ampicillin, arsenilic acid, bacitracin, chlortetracycline, dihydrostreptomycin, monensin, oleandomycin, penicillin, roxarsone, spectinomycin, and tylosin.My main concerns as a veterinary public health specialist are the transfer and ramification of antibiotic-resistant bacteria into the human population via the food of animal origin or into the animal population via the humans. But when it comes to the developing countries like India than the contribution of veterinary seem least important compared to the uncontrolled and unregulated use of antimicrobials by the human population and farm owners/workers. Control at the veterinary side will be of no use if same not controlled at human side.

There have been reviews and research focusing on: first, the accumulation of resistant bacteria by the use of antibiotics in veterinary but it is important to mention the level of contribution of veterinary in development of antibiotic resistance; second, the spread of resistant bacteria from animals or food of animal origin but spread can be from human to animals as well. and third, the direct contamination of consumers and their digestive systems with food containing resistant bacteria, including pathogens of veterinary origin. The possible source again can be the human not following hygienic rules.

Conclusion

The molecular analysis of antibiotic resistance genes, plasmids and transposons have validated that identical elements are found in animals and humans. But the question is about the transmission of resistant bacteria that circulates in the population in a cyclic manner like a human to animal and then back from animal to human and likewise. So controlling the use of antibiotics at farm level will not be effective if workers of that farm are neither checked for antibiotic-resistant pathogenic bacteria nor educated for use of antibiotics in both human and animal life. Another question to be answered is whether or not antibiotic use as feed additive should be controlled in animal farms in developing countries like India which is suppose to feed the large population. So such countries need to have practically applicable antibiotic resistance control program rather than a perfect program. Like having new antimicrobial drugs termed as “green antibiotics” or irestrict use of antibiotic that are critically important for human life [4]. Therefore, prudent use of antibiotics must be followed and should be pursued until exact

statistics on the quantitative contribution of veterinary medicine to the antibiotic resistance problem is available.

References

1. Singer RS, WilliamsNJ (2014) Human health impacts of antibiotic use in agriculture: a push for improved causal inference. CurrOpin Microbiol 19: 1-8.
2. Collignon P, Aarestrup FM, Irwin R, Mc Ewen S (2013) Human deaths and third-generation cephalosporin use in poultry, Europe. Emerg Infect Dis 19(8): 1339-1340.
3. Almeida A, Duarte S, Nunes R, Rocha H, Pena A, et al. (2014) Human and Veterinary Antibiotics Used in Portugal-A Ranking for Eco surveillance. Toxics 2(2): 188-225.
4. Toutain P, Ferran A, BousquetMA, Pelligand L, Lees P (2016) Veterinary Medicine Needs New Green Antimicrobial Drugs. Front Microbiol 7:1196.