Antibiotic Residues in foods; a public Health Hazard

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Dear Editor:

Today, antibiotics are used in the farm animal with the aim of treatment of infections, prevention of diseases and growth promotion. Due to several reasons including ignorance of withdrawal periods of antibiotics, use of extra label dosage for animals, animal feed contamination with the excretion of treated animals and use of prohibited antibiotics, residues may found in foodstuffs of animal origin such as meat, milk, honey and eggs.

Antibiotic residue in food of animal origin raise numerous public health concerns. Clearly, the use of antibiotic in livestock production has been associated with the development of human antibiotic resistance. It has been documented that human develop drug resistant bacteria such as Salmonella, Campylobacter and Staphylococcus from food of animal origin. Moreover, mutagenic, allergic and hypersensitivity reactions (e.g. penicillin) and carcinogenicity (e.g. nitrofurans, nitromidazoles and quinoxaline, sulphamethazine) and teratogenicity are some of other hazards.

Antimicrobials circulate into every tissue and fluids of the body before excretion. High amounts of antibiotic residues were detected in milk and meat consumed by human. MohamadiSanier al. (2010) investigated the presence of antibiotic residue in milk samples by Copan test, which is able to detect betalactams, tetracyclines, sulfonamides, aminoglycosides and macrolydes residue in milk. Copan milk test was positive for 40.8% of the samples in Khorasan province, Iran.

Aalipour et al. (2015) reported the mean concentration of total tetracyclines (TETs) in milk in Shahrekord, Iran as 252.41 μg/kg, which is approximately 2.5 times greater than the maximum residue limit (MRL) set by codex. Oxytetracyclin had the highest share (86%) of the determined antibiotics among four different analyzed tetracycline antibiotics.

In a study up to 56% of fish meat samples were contaminated with three antibiotics including chloramphenicol, sulfonamide and tetracycline (TC) in northwest of Iran. The antibiotic residues concentrations in the positive samples ranged within 0.09–22.12 ng/g and the TC contamination (30%) was the highest percentage of antibiotic residues in fish meat samples. Amount of mean concentration of TC residue (8.44±6.03 ng/g) in positive samples was higher in comparison with other antibiotics.

Presence of some prohibited antibiotic such as chloramphenicol raise a greater concern for public health authority. The issue of antibiotic residue in foods of animal origin has rarely been a serious concern in developing countries in contrast to the situation in Europe. World Health Organization (WHO) reported that 6–11.9% of all new Iranian tuberculosis (TB) cases had multidrug-resistance.

New data on other microorganisms showed multi-resistant strains in Pseudomonas aeruginosa, Campylobacter jejuni, Acinetobacterbaumannii, Arcobacter species, Helicobacter pylori, Bordetella pertussis, Enterococcus spp., Acinetobacter spp., Candida spp., and others. Most notable is the increase in multi-drug resistant hospital pathogens, including vancomycin resistant enterococci in Iran.
By administration of antibiotics in animal, antibiotic residues could present in high or low concentrations in their products. However, amount of these residues mainly depends on the duration of antibiotics usage. After the administration of antibiotic, their residue in the milk or meat gradually decreased. A shared responsibility among different stockholders including the government is very imperative to control the antibiotic residue. Furthermore, Use of antibiotics only for therapeutic purposes and in the proper doses and period made a great effect on the prevention and control of antibiotic residue. The availability of sensitive equipment and modern analytical techniques are of paramount importance in the detection, control and prevention approaches.

References


