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Popular Article

Emergence of Antibiotic Resistance in Cattle Acting as Silent Killer the Society

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Introduction

In 21st century, with advancement of science which leading to the discovery of new drugs for the betterment of animal and society there is also silently advancing shoulder to shoulder with advancing technology is ABR (Antibiotic Resistance). now a days due to increasing use of multiple drugs with inappropriate and no specific use of antibiotic in multiple aspect in cattle as majorly in therapeutic management of mastitis in cattle in the field condition. Many study claims that the spread of resistant strains of mastitis-causing bacteria, like *Staphylococcus aureus* and *Escherichia coli* to humans. The phenomenon occurs when pathogenic microbes are non-responsive to the standard doses of antibiotics (Acar *et al.* 2001). Large ruminants like cattle and buffalo take a substantial share of ABR for being the reservoir of resistant strains. Bacteria commonly associated with disease called mastitis, such as *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas* spp., *Proteus* spp., *Klebsiella* spp. etc., and antibiotic residues in milk after therapy can be led to resistance. Milk is an essential staple food in Indian households. The rising demand, driven due to high population growth, rising income, and urbanization. There exists a positive correlation between high milk yield and mastitis. Mastitis is predominantly a bacterial disease of the mammary gland of high-yielders. The most common treatment of mastitis is with antibiotics administered intramammary into the infected quarters of the udder and parental injection. The repeated use of antibiotics to treat bovine mastitis for a long period may cause multi drug resistance in causative organisms, which will require increased doses of antibiotics leading to the accumulation of large amount of antibiotics in milk and its products (White and McDermott, 2001). In the context of increasing multi drug resistance and the demand for organic products, the search of alternative drugs based on the pharmacological and phytochemical properties of plants became a priority in livestock health research (Rios and Recio, 2005). Medicinal plants can be used as an alternative therapeutic

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option or as an adjunct agent in managing bovine mastitis. They can be used as an anti-bacterial, anti-inflammatory, and immunomodulatory agent for the treatment of mastitis (Mushtaq *et al.* 2018). Antibiotics are often used or misused in the dairy sector for therapeutic and prophylactic purposes. Antibiotics are also eliminated in the milk till 7 days post-treatment. However, there is an absence of compliance to milk withdrawal periods following antibiotic administration, which leads to antibiotic residues in milk. Hence, improper use of antibiotic therapy in milch animals poses a threat to the public, especially if milk is consumed unpasteurized. The consequences of ABR are speculated to be more severe in low-and middle-income countries like India, where the burden of infectious diseases and the use of antimicrobials thereof is high. The issue is further complicated by poverty, illiteracy, overpopulation, and starvation, all of which have contributed to developing drug resistance. Based on these facts, India is often considered the “antimicrobial resistance capital of the world.”

A study shows a period between 2000 to 2010 there is about 76% significant increase in global antibiotic consumption in India, Brazil, Russia, China and South Africa out of which 23% increase was alone in India (Boeckel *et al.* 2014). The dairy sector is often considered one of the major drivers of agriculture-related ABR, the linkage between antibiotic use in the veterinary sector and ABR pathogens is not fully established. However, the data from such studies cannot be extrapolated to give a clear picture of ABR in India, a prerequisite to preparing a strong strategy to combat this life-threatening health issue. To use antibiotics appropriately and maintain the therapeutic arsenal, which ensures the medicines’ long-term efficiency, it is important to estimate the level and trend of resistance in udder infections. In this context, a review was undertaken to assess the status of resistant bacteria and antibiotic residues detected in the milk of dairy cows across India. Milk often contains residues of antibiotics following its administration through intramammary and parenteral routes. According to the European Commission, antibiotic residues termed as “pharmacologically active substances and their metabolites which remain in foodstuffs obtained from animals to which the veterinary medicinal products have been administered.” There is a milk withdrawal period that extends to 7 days following antibiotic therapy. However, it is rarely practiced by farmers due to ignorance about its adverse health impacts and financial losses associated with milk discard.

Conclusion

Antibiotic resistance is a global health hazard issue affecting humans and animals as a silent killer. Antibiotic resistance has proved more harmful to humans when it originated in food-producing animals as the residual antibiotic and the resistant bacteria spread quickly to multiple hosts, including humans, through milk. Thus, a universal strategy involving all farmers and stakeholders is essential to put break in the development of new strains and in reducing morbidity and mortality associated with Antibiotic resistance.

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