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Commentary

The Rise in Antibiotic Resistance: The Misuse and Overuse of Antibiotics

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1. Description

After two years of penicillin's widespread manufacture starting in 1945, patients started developing bacterial resistance to the antibiotic. Since then, reports of the development of antibiotic resistance against almost all currently known antibiotics have been made. Antimicrobial Resistance (AMR) is a recognised global problem by organisations like the World Health Organization (WHO) and the US Centers for Disease Control and Prevention (CDC). One important factor contributing to the rise in antibiotic resistance is the misuse and overuse of antibiotics. By 2050, drug-resistant illnesses are expected to be the cause of approximately 10 million additional deaths if the scientific community does not manage and replenish our antibiotic supply. Several interventions that we currently take for granted will be in danger in a post-antibiotic age. The treatment of immunocompromised patients, organ transplant recipients, general surgery patients, and those with prosthetic implants are a few examples of these medical advancements. Significantly, rising levels of antibiotic resistance are already having a significant effect on the treatment of cancer patients. The Biden Administration and medical society both prioritise eradicating cancer as we know it, but attaining this aim will also need action against drug-resistant microorganisms. Patients with cancer frequently get infections, and good antibiotics are essential for both preventing and treating bacterial infections.

Antimicrobial Resistance (AMR) has become a serious threat to public health, with estimates that it kills 1 crore people every year. Due to first-line antibiotic resistance, more infants pass away from sepsis each year. The overuse and improper use of antibiotics are significant factors in the emergence of antibiotic resistance, which could have detrimental implications on human health. The rise of bacteria that are totally resistant to existing antibiotics is a problem in a number of nations. In accordance with WHO recommendations, the majority of nations are putting together a country-specific action plan for the global management of AMR. The global burden of drug-resistant bacteria is heaviest in Asian nations. In addition, India is one of the world's top consumers of antibiotics, and abuse and overuse of these drugs are rampant

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Antimicrobial failure increases the risk of sepsis, sepsis-related death, and sepsis-related healthcare expenses in cancer patients. The fact that oncologists were among the first to note the clinical effects of developing antimicrobial resistance is therefore not surprising. For instance, a recent survey in the UK revealed that 46% of oncologists in the country are concerned that chemotherapy as a cancer treatment may be challenging due to drug-resistant infections. Antibiotic resistance threatens to reverse much of the hard-won progress against cancer, making it imperative to maximise the use of existing antibiotics and identify new antibiotics to protect cancer patients from antibiotic-resistant infections in the future. The ability of bacteria to endure exposure to drugs that would otherwise kill them or stop their growth is known as antibiotic resistance.

Antibiotic abuse in both humans and animals, antibiotic use in the food and livestock industries, a lack of quick diagnosis techniques, and the presence of antibiotics in the environment are some of the major causes of antibiotic resistance. Inherent or acquired antibiotic resistance can result from numerous genetic processes. The main mechanisms of antibiotic resistance have been highlighted. In contrast to Multidrug-Resistant (MDR) isolates, which are characterised by demonstrating resistance to 3 separate classes of antibiotics, some pathways can result in antibiotic resistance in 1 or 2 classes of antibiotics. Colleagues named six categories of bacteria (*Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *A. baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter spp*.) as ESKAPE pathogens because they were frequently linked to antibiotic resistance in the hospital setting. With regard to risk factors, antibiotic use, management, and prevention of antibiotic resistance in cancer patients, we concentrate on current advancements concerning antibiotic-resistant ESKAPE infections in this study.