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AMR; A Serious Threat to Global Health

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ABSTRACT

Antimicrobial resistance is one of the major leading issues in the world that is continuously becoming a huge threat to the health of different living things. Along with health, it is seriously affecting the economy. Due to AMR day by day, it is becoming more difficult to combat different pathogens. Once a pathogen builds resistance against any drug, it is difficult or impossible to use that drug again against that pathogen. Proper caution should be taken in order to control the enhancing phenomena of AMR.

History

In the early 1940s, penicillin was the first and most successful antibiotic drug. It was used to control the bacterial infections occurring among the soldiers during the time of world war II. Shortly after the discovery, bacteria started to develop resistance against penicillin. So in 1950 many of the benefits of previous years started to turn into threats. In order to restore confidence against the response of drug resistance, scientists discovered new beta-lactam antibiotics [1]. In the case of MRSA **(**Methicillin-resistant Staphylococcus aureus/superbug, a group of gram-negative bacteria that are genetically different from other stains of staphylococcus aureus**)**, the drug vancomycin was introduced to control the resistant bacteria but later cases of vancomycin resistance were also reported in 1972 and 1979. This did not stop here, there is a number of drugs from the discovery of the first antimicrobial drug that is showing zero or minimal effect against different kind of pathogens.

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Introduction

Antimicrobial resistance (AMR) is a burning issue nowadays and has a huge concern for human, animal, and plant health. AMR is defined as any pathogen's ability (bacterial, viral, protozoal, and fungal) to counter/ survive therapeutic doses of a certain drug. Due to this issue, pathogens become more powerful and untreatable. The phenomenon of resistance is dramatically increasing in recent years because the speed of discovering new antimicrobial drugs is way too slow than the irrational use of these drugs [2]. One of the leading problems at clinics is that the available antimicrobial drugs are slowly losing their potential effects against disease-causing agents, and it is a serious threat to the ability to treat the microbes. Because of AMR, to some extent, it has been difficult or almost impossible to treat normal/regular infections (those infections which are treatable by using antibiotics nowadays) as well [3].

Cause of AMR

It usually occurs due to the phenomena of gene mutation and gene transfer that happens in the microbial/bacterial DNA. The insane, irresponsible, prolonged, and inappropriate uses of antibiotics are also the leading cause of the enhancement of antimicrobial resistance. Moreover, poor hygiene is also supposed to be the cause of AMR. The use of antimicrobial preparations as growth and immune promoters in the poultry industry and livestock sector is also the other major cause of AMR. This issue does not only affect the animals but is also a huge threat to the environment and consumers who consume the animal's end products [4]. On the other hand, lack of knowledge, awareness, and enforcement of legislation is also a contributing factor in the spread of AMR. If this remains happening, we may fall into post antibiotics era where it would be difficult or impossible to treat normal and minor infections, injuries, and diseases using antibiotics. Moreover, the mortality rate would also be at its peak [5].

Economic Burden

Along with the health issues AMR is also responsible for the economic burden. Majorly the cost of AMR is categorized into three different ways. One is at the patient level, the second is at the healthcare level and the third is at the economic level. A patient having a disease caused by a resistant pathogen experiences more expensive treatment than a non-resistant pathogen. AMR will take the world to expensive treatments, due to high-cost treatment and increase in resource utilization. AMR project is expected to cost from $300 billion to more than $1 trillion annually by 2050 worldwide [6]. Economically the burden of AMR is different in different countries.

Control

p impaction is caused by crop blockage which occurs when stored feed digestive tract efficiency and improves absorbance of nutrients.

Conclusion

For a long time, the control of antimicrobial resistance is the center of thought for scientists. They are continuously doing experiments and research to minimize or nullify the outcomes of antimicrobial resistance. Through different ways, we might control the exceeding phenomena of AMR.

1. There is economically very low investment in the line of antibiotics due to low prices and a short period of usage as compared to their need. In order to make more antimicrobial drugs we need a huge budget so we can easily treat diseases. The costs of antibiotics are not so much high, so this kind of situation makes the drugs accessible to those patients who are trying to go for self-treatment.
2. Physicians should avoid prescribing antibiotics unnecessarily and irresponsibly to patients [6].
3. Poultry industry and livestock sectors should stop using antimicrobial growth promoters as they pass through the food chain of humans.
4. We can also use vaccination for the reduction of AMR as they are less likely to induce resistance.
5. There should be a wise use of antimicrobial products for agricultural growth as it is also a contributing factor to AMR. The overuse of biochemical and antimicrobial sprays, pesticides, and insecticides is the cause of AMR spread.
6. Take proper care of hygiene and sanitation.

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