The Rise of Antimicrobial Resistance: A Public Health Crisis

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Abstract- ***Antimicrobial resistance (AMR) is an escalating worldwide health issue that affects our capacity to successfully treat bacterial infections (Wright, 2020). The World Health Organisation (WHO) has recognised AMR as one of the foremost global health hazards facing humanity, carrying the potential for catastrophic repercussions (WHO, 2020). Antimicrobial resistance (AMR) arises when bacteria acquire traits or methods to circumvent the impact of antimicrobial medicines, including antibiotics, antivirals, and antifungals (CDC, 2020).***

I. INTRODUCTION

Antimicrobial resistance (AMR) is an escalating worldwide health issue that affects our capacity to successfully treat bacterial infections (Wright, 2020). The World Health Organisation (WHO) has recognised AMR as one of the foremost global health hazards facing humanity, carrying the potential for catastrophic repercussions (WHO, 2020). Antimicrobial resistance (AMR) arises when bacteria acquire traits or methods to circumvent the impact of antimicrobial medicines, including antibiotics, antivirals, and antifungals (CDC, 2020).

New research has shown an unexpected approach to tackle antimicrobial resistance (AMR): inducing fever. A team of European researchers has revealed that fever can inhibit the development of antibiotic resistance in bacteria (Bergman et al., 2023). This revolutionary discovery has the likelihood to pave the way for novel strategies in curtailing the dissemination of antimicrobial resistance (AMR).

Excessive and incorrect use of antimicrobials in both human health and agriculture have quickened the development of antimicrobial resistance (AMR) (O'Neill, 2016). Consequently, previously manageable diseases including pneumonia and urinary tract infections can turn fatal (Peto et al., 2020). Antimicrobial resistance (AMR) also affects our capacity to carry out regular surgical procedures and manage chronic illnesses, such as cancer and diabetes (Cassini et al., 2020).

The consequences of antimicrobial resistance (AMR) are extensive and carry substantial economic and societal ramifications (Laxminarayan et al., 2020). In addition to the increased morbidity and death, AMR also leads to longer hospital stays, greater healthcare expenses, and lower productivity (Robledo et al., 2020). Furthermore, AMR impairs our ability to combat infectious diseases, such as tuberculosis, malaria, and HIV/AIDS (WHO, 2020).

To address AMR, we must adopt a multidimensional approach that encompasses governments, healthcare providers, agricultural sectors, and individuals (Laxminarayan et al., 2020). Strategies include strengthening antimicrobial stewardship, creating novel antimicrobials, and enhancing infection prevention and control methods (Tacconelli et al., 2020). Vaccination and immunotherapy are also vital in preventing infections and minimising the demand for antimicrobials (Robledo et al., 2020).

Incorporating the latest discoveries on fever's involvement in preventing AMR, researchers indicate that creating a controlled fever response may be a feasible technique to prevent the development of AMR in bacterial infections (Bergman et al., 2023). While additional research is needed to completely understand the mechanisms behind this event, this discovery offers a promising route for exploration.

II. CONFRONTING THE THREAT IN THE UNITED STATES

Antimicrobial resistance (AMR) is a major public health risk in the United States, endangering our capacity to treat bacterial illnesses successfully. The Centers for Disease Control and Prevention (CDC) has listed AMR as one of the major public health concerns confronting the country.

The overuse and misuse of antimicrobials in human medicine and agriculture have brought about the onset of AMR in the United States (FDA, 2022). As a result, diseases that were once easily curable, such as pneumonia and urinary tract infections, can turn lethal (CDC, 2022). AMR also impairs our ability to perform routine procedures and manage chronic diseases, such as cancer and diabetes (NIH, 2022).

The repercussions of AMR are far-reaching and have substantial economic and societal implications for the United States (HHS, 2022). In addition to the increased morbidity and death, AMR also leads to longer hospital stays, greater healthcare expenses, and lower productivity (CDC, 2022).

To tackle AMR, the U.S. government has started projects to strengthen antimicrobial stewardship, develop novel antimicrobials, and boost infection prevention and control methods (HHS, 2022). The CDC, FDA, and NIH are working collaboratively to monitor AMR patterns, create new diagnostic tools, and fund research into potential therapies (CDC, 2022).

Recent studies have cited the potential of modern technologies, such as artificial intelligence and machine learning, in detecting and predicting AMR patterns in the United States (NIH, 2022). Additionally, research into the human microbiome and antimicrobial peptides offers interesting pathways for creating novel medicines (NIH, 2022).

In conclusion, the increase of antibiotic resistance is a public health catastrophe that requires prompt attention and action. By understanding the causes, effects, and solutions to AMR, we may work towards a future where effective therapies for bacterial diseases are safeguarded. It is our joint responsibility to solve this global health concern and provide a safer, healthier world for generations to come. By working together, we can prevent AMR and protect public health.

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