

‘Superbugs’ and antibiotic resistance*

Over seven lakh people in India die of infections caused by antibiotic-resistant bacteria every year. This is because antibiotics used against harmful bacteria are becoming less effective. Certain strains of drug-resistant bacteria make treatment of infections much difficult. Bacterial infections that were treatable earlier, no longer respond to antibiotics. This means that these superbugs have become more dangerous and threatening. To kill these bugs, more aggressive and stronger antibiotic combinations are used, which can cause unwanted side effects. ‘Superbugs: The End of Antibiotics?’, the travelling exhibition at Nehru Science Centre, Mumbai, helps create awareness regarding this huge crisis. The exhibition has travelled to London, New York, China and Argentina. It has now been customized to the Indian scenario.

An accidental discovery in 1928 changed the course of medicine when bacteriologist Alexander Fleming noticed an area around an invading fungus on an agar plate in which the bacteria did not grow. He separated the mold and on analysis found that this belonged to the Penicillin genus. The active agent was penicillin that had an antibacterial property, which helped kill staphylococci and other Gram-positive bacteria. Penicillin proved to have curative properties against infectious diseases. Thus began the era of antibiotics and vaccines against a hoard of microbes and disease-causing bugs.

It was Fleming who prophesied about ‘Superbugs’ becoming immune to antibiotics. Antimicrobial and antibacterial resistance have created a global menace. This exhibition is a global endeavour with a message for people. Padma Vibhshan Man Mohan Sharma, emeritus professor, Institute of Chemical Technology, Padma Bhushan physician Farukh

Udwadia, Crispin Simon, British Deputy High Commissioner for Western India and Helen Jones, Global Engagement and Strategy, Science Museum Group, UK, inaugurated the exhibition.

Crispin Simon expressed that this exhibition is for raising awareness in antimicrobial resistance collaboration; 18 collaborations have come from India. Guest of Honour Udwadia, remarked that although antibiotic resistance is a global crisis, it has conquered Indian people. Because of evolution and mutation of bacterial strains, genetic change, changes in the bacterial cell wall, bacterial works and horizontal gene transfer, the bacteria find ways to adapt and are not easily destroyed by antibiotics. Large population, lack of regulation of antibiotic use, improper dosage, not using the correct way of administration, choice of antibiotics, all cause antibiotic resistance. Most importantly, overuse and misuse of antibiotics is the cause.

Amongst the many bacteria that cause infections, Gram-negative bacteria are the nastiest of all bugs – 50–60% of them are antibiotic-resistant. Almost ten million people could die every year due to antibiotic resistance by 2050. One must look for therapies outside antibiotic drugs, mentioned Udwadia. He suggested having surveillance in hospitals, computing the resistance of antibiotics, and having facilities to identify the bacteria and its specific antibiotic drugs. Hospitals need to have infectious disease-control committees that carry out surveillance of microbes. Antibiotic programme also needs to be monitored. Hand washing needs to be a priority. As mentioned by Udwadia, easy availability of antibiotics over the counter has to change; pharmacists should not be allowed to sell antibiotics without prescription.

In his inaugural address, Sharma emphasized on tuberculosis (TB) treatment. Twenty five per cent of TB patients are from India. Presently even BCG vaccine and modified BCG vaccine do not work against TB. Multi drug-resistant TB has made treatment difficult.

Sharma mentioned about urinary tract infections (UTIs) in women. Many UTIs become resistant to antibiotics, which is a serious problem. Discovery of a new molecule is difficult. In recent days combination drugs have arrived, which could be effective. It is therefore imperative to create awareness in India, stressed Sharma.

The exhibition is all about regulation, awareness and education. It will help shed light on the proper use of antibiotics. The global community needs to come together to address this issue of superbugs becoming resistant to antibiotics. These resistant bacterial infections become difficult to treat, leading to higher medical costs, hospital stays, trauma and death. There is an urgent need to change the way antibiotics are used and prescribed. More than ever, vaccination, hand washing, practicing safe sex, good personal and food hygiene can help reduce the spread of infections.

‘Superbugs’ exhibition displays some of the deadliest pathogens with interactive screens, touch-books and audios to educate people regarding the history of antibiotics and Alexander Fleming. The interactive models are engaging. A giant model of ‘Superbug’ is created out of large medicine pills, antibiotics, microbes, etc. The highlight of the exhibition is the antique-looking earpiece from Fleming’s time, which plays the original voice of Fleming, prophesizing about the problems of antibiotic resistance in the future.

The ‘Superbugs: The end of antibiotics’ was displayed at National Science Centre, New Delhi from 6 September to 17 November 2019. It will be at Mumbai at Nehru Science Centre from 18 December 2019 to 16 February 2020. The travelling exhibition will then go to Visvesvaraya Industrial and Technological Museum at Bengaluru from 20 March to 17 May 2020 and then to Science City, Kolkata from 19 June to 30 August 2020.

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