Antimicrobial Resistance (AMR) and COVID-19

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In the wake of new challenges to human health worldwide due to COVID-19, it becomes imperative to come up with long term solutions keeping in mind a bigger threat of Antimicrobial Resistance. The scientists and pathologists play a key role in this pursuit. All the news surrounding to COVID-19 becomes important for UPSC CSE from the perspectives of both Prelims and Mains.

In news: ***Fatal bacterial infections may stem from COVID-19 therapies***

Placing it in syllabus

Science and Technology- developments and their applications and effects in everyday life.

Indigenization of technology and developing new technology.

Static dimensions

1. Antimicrobial Resistance
2. COVID-19

Current dimensions

1. New therapies to COVID-19
2. Threat of Antimicrobial Resistance (AMR) emanating from therapies
3. National Action Plan on Antimicrobial Resistance (NAP-AMR) 2017 – 2021

Content

New therapies to COVID-19

- The lack of therapies to treat severe COVID-19 patients led clinicians to use a number of treatments to modify the activity of their immune system.
- The researchers found that virus SARS-CoV-2 and bacteria in the lungs may affect each other's ability to cause damage and worsen the outcome.
- The research has raised concerns of the impact of COVID-19 on AMR globally. The World Health Organisation recently expressed fears that the pandemic will increase the global threat of AMR as many COVID-19 patients receive antibiotics as part of their treatment regime.
- It is critical that co-infections should not be underestimated and instead be part of the plan to limit the global burden of morbidity and mortality during the COVID-19 pandemic and beyond.

What is Antimicrobial Resistance (AMR)?

- AMR is a global public health threat, according to the World Health Organization, which mutates the microbes rapidly to become resistant to a drug is in the inherent nature of a microbe.

How Antimicrobial Resistance works?

- AMR happens when microorganisms (such as bacteria, fungi, viruses, and parasites) change when they are exposed to antimicrobial drugs (such as antibiotics, antifungals, antivirals, antimalarials, and anthelmintics).
- Microorganisms that develop antimicrobial resistance are sometimes referred to as "superbugs".

What leads to AMR?

- Indiscriminate use of antibiotics against infections
- Misuse of antibiotics in humans, animals, and aquaculture.
- Poor management of waste from farms, factories,

healthcare settings and households.
- Over the counter purchase of antibiotics without doctor's prescription.
- Partial completion of antibiotics dosage
- Comorbidity

Why Antimicrobial Resistance (AMR) is a problem?

With rising AMR, antibiotics are increasingly becoming ineffective for treating diseases in humans. If there is no timely containment, AMR is to be more fatal and result in significant global economic losses.

- There is already a rampant misuse of antibiotics around the world and India tops in this. As more and more antimicrobials are used to control the virus and the co-infections, this will further increase Antimicrobial Resistance in India.
- The industry – healthcare, pharma, food animal, agriculture – has not taken any serious action against the global pandemic of AMR.
- It would also impact nutrition security and livelihood.
- It will hinder the attainment of the Sustainable Development Goals.

New COVID-19 therapies link to AMR

- The world is struggling hard to control the COVID-19 pandemic.
- This is difficult as the disease is new and we do not have specific drugs and vaccines to treat it or create immunity against it.
- We have only the existing broad-spectrum antimicrobials to try against COVID-19 which may increase the AMR significantly.
- Anti-malarial drugs **chloroquine and hydroxychloroquine** are in great demand. It is yet not clear whether they work on COVID-19 or not.

- **Chloroquine** is now ineffective against its primary malaria parasite *Plasmodium falciparum.*
- A combination of two HIV drugs, **lopinavir and ritonavir** are being experimented.
- Another top contender against coronavirus is the antiviral **remdesivir** which is an experimental drug developed to treat Ebola virus has been found effective against coronavirus. It shortened the time needed by hospitalised adults to recover by four days and also reduced the incidence of lower respiratory tract infection.
- Viral infections can damage cells and make them more susceptible to bacterial infections.
- Co-infections are a primary problem in COVID-19 patients. Most of these are caused by bacterial pathogens against which, antibiotics are now more or less ineffective. This leads to high mortality.
- Hospital acquired infections, also notorious for being resistant, can add to the death toll for COVID-19 patients.
- Nearly half of the patients who died in hospitals in China suffered from co-infections. They died despite being treated with antibiotics.

National Action Plan on Antimicrobial Resistance (NAP-AMR) 2017 – 2021

In 2015, Global Action Plan on Antimicrobial Resistance (GAP-AMR) – including antibiotic resistance, the most urgent drug resistance trend was endorsed.

The WHA resolution urges Member States to align their National Action Plan on AMR with GAP-AMR by May 2017.

The Ministry of Health & Family Welfare notified three governance mechanisms in 2016 to address this challenge and the National Action Plan on Antimicrobial Resistance (NAP-AMR) was prepared.

The strategic objectives of NAP-AMR are aligned with the global action plan based on national needs and priorities, and in addition to the 5 priorities of GAP-AMR, India has a sixth priority that is India-specific dealing with India's leadership on AMR – including international, national and sub-national collaborations on AMR.

Six strategic priorities have been identified under the NAP-AMR:

1. Improving awareness and understanding of AMR through effective 4 National Action Plan on Antimicrobial Resistance | India communication, education and training.
2. Strengthening knowledge and evidence through surveillance.
3. Reducing the incidence of infection through effective infection prevention and control.
4. Optimizing the use of antimicrobial agents in health, animals and food.
5. Promoting investments for AMR activities, research and innovations.
6. Strengthening India's leadership on AMR.

Mould your thoughts: What is Antimicrobial Resistance? How is it perceived to be a bigger threat than that of COVID-19? Explain.