



ANTIMICROBIAL RESISTANCE (AMR) IN THE TIME OF COVID-19 PANDEMIC AND LOCK DOWN SCENARIO IN INDIA: A NEED FOR STRATEGIC FUTURE POLICY

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ABSTRACT India is home to the largest number of drug resistant pathogens in the world. Post COVID-19 pandemic all resources are focused on containing the virus with lock down and physical rather than ,social distancing, which are also proactive to reducing anti- microbial resistance. Antimicrobial resistance and COVID- 19 virus have some significant similarities which can be used to form Policy and strategies for control, surveillance and monitoring. There is a need to strengthen weak health infrastructure and a combined National Action Plan is proposed to equip against the double menace of Antimicrobial resistance and COVID- 19 virus in India.

KEYWORDS :

INTRODUCTION:

India is one of the low and middle income countries which is home to the largest number of drug resistant pathogens in the world. Antimicrobial resistance AMR occurs when microorganism, bacteria, virus, fungi, or parasites develop resistance to the effects of medications making common infections harder to treat increasing risk, severity, mortality and morbidity due to the infection.(1) The highest resistance in humans was found in *A. baumannii* , followed by *K. Pneumonia*, *P. aeruginosa* and *E.Coli* from ICMR surveillance network data from four tertiary care hospitals. To name a few last resort antibiotic Colistin, Carbapenem resistant gram negative bacterial infection in humans. Antibiotic resistant pathogens have also been isolated from livestock NDMI milk samples, and fish gut samples. Sewage treatment plants Hospital waste, pharmaceutical industrial pollution and environmental samples from rivers. Antibiotics are also fed to food animals which increases AMR in human pathogens similarly chemicals used in agriculture have contributed to AMR. Multi drug resistant *M. Tuberculosis* has fast changed to X DR to which no antibiotic is available. The pandemic of Antimicrobial resistance affects life threatening conditions like Neonatal sepsis, Immuno-compromised patient, Pneumonias and post- surgical wound infection for which every option is exhausted. The highest AMR in animals are currently found in India and China in animals like poultry, cattle, as well as environment water and soil in places of overcrowding and sewage seepage.

The reasons for this sorry state in India start with weak health care infrastructure and lack of Public spending on health, India spends 4.7% GDP on health of which only 1.15% is by Public spending. Lack of number of qualified doctors in needy areas as well as lack of integration of AMR in medical education. The need for stricter regulation, monitoring and sale of over the counter antibiotics, and paybacks by pharma industry makes contribution to AMR. Various Cultural and Social factors which increase mobility, and social interaction cause pollution of rivers, environment and soil. There is a need for more education about the dangers of over and unauthorized prescription of antibiotics and monitoring of AMR.

National Policy on AMR A National Task Force on AMR containment 2010 was followed by the adoption of National Policy for containment of AMR (4).The Jaipur Declaration included antimicrobial containment in the 12th 5 year plan, however no targets were met, The ICMR “Chennai Declaration” August 24, 2012 put a good foot forward in this regard by placing Red line on Antibiotics to public attention to the dangers of its misuse(5). Following which the National Action Plan (NAP) on AMR in 2017 drew a six strategy priority in AMR (6). Implementation remained weak because the root of weak Public health infrastructure was not upgraded. Anti- microbial resistance is found harbored in hospital acquired infections. Areas of poverty, overcrowding poor living conditions which lack authorized prescriptions and treatment. Pollution of soil and waters by seepage and industrial effluents. These are the same hot spots and drivers of Corona 19 pandemic in India resulting in Double Jeopardy. (7-10)

Lock down and AMR. The unprecedented pandemic has pushed the weak health care system to the limits. The policy of Social distancing

and strict lockdown has been our best strategy and available treatment.(11) The gains from country wide strict first lockdown need complete evaluation and future research as almost 40% households lack access to soap and potable water in poor homes.(12) Though it restricted non-Covid patients from treatment at Public as well as Private hospitals(controlling prescribed medicines as well as antibiotics) , restricted out door movement (which contained spread of seasonal illness),use of masks, WASH technique and use of soap and sanitizer (improved nation- wise information awareness on spread of droplet and water borne infections).The benefits gained in AMR control need evaluation the community is reverting back too soon to unsafe practices during successive unlock phases.

Due to the global disruption of supply chains of antibiotics made in China the ICMR reviewed the National list of essential medicines schedule (NLEM) and found 35 drugs which we could become short in supply including antibiotics like Azithromycin, ofloxacin , metronidazole, vitamins and female hormones. The sale of which are being monitored closely for quality, quantity and price control by the National pharmaceutical pricing authority (NPPA). Tight control by regulatory body on sale of antibiotics and check of the H1 list of antibiotic sale register which maintains details of patient prescription and contact details in licensed pharmacies should have remedied over the counter irregular taking of antibiotics (13). The other side of the coin is that patients with socio economic inaccessibility to therapeutic health care in regions of increased burden of COVID -19 would be forced to solicit the local Pharmacist or non- qualified health provider in the region as usual or more than before the lock down(10). This needs further evaluation because India has wide disparities and different drivers to health seeking behavior in different regions.

In lock down Industries were closed drastically reducing polluted sewage and effluents reaching water bodies and rivers. The rejuvenation of water bodies (Ganges water fit for drinking (class A) in the upper stretches and for outdoor bathing (class B) in the middle and lower stretches (14). Likewise the Yamuna river had improvement of 37% fecal coliforms declined by over 40% (15). There was a fall of pollution of environment (Air quality index over Delhi NCR improved by 60%and pollution drastically decreased in the first Lockdown 14th April to 3rd May 2020(16).Ironically the challenges that Environment policy was aiming at but failing to meet, were gained as a double benefit of lock down restrictions, social distance and safe hygienic practices. The expected gain in AMR reduction, has unfortunately not been documented due to lack of community and hospital data on AMR surveillance.

AMR In time of Covid 19 the unwelcome guest who refuses to leave As per Indian Epidemiologists Indian Public health Association (IPHA) ,Indian Association of Preventive and Social Medicine(IAPSM) the Corona virus curve is expected to have different incidence curves in different regions in India as we are a country of different socio-cultural realities and practices so solutions should also be region specific(17). Poverty inaccessibility of water, sanitation, hygiene, infrastructure and universal healthcare. Makes the slogan of Social distancing empty(rather the term should be physical distancing) as more than half of India has inaccessibility and

inequality as the biggest obstacle. The reality of the area or region will determine the course of COVID-19(18). In metropolitan cities the sharp curve is expected to be followed by a “prolonged inverted U” of decline with possibility of resurgence. The virus is expected to create small region specific pandemics within the scenario of the national and state incidence figures. These regions are the place of high burden, poverty, comorbidity, over- crowding of housing, including following cultural and society practices which do not follow physical- distancing which define the term of hot spot (19). With rural spread region specific epidemiology profile is expected, one national statistics cannot encompass the profile of the whole country. Eventually half of India will get COVID -19 and there are unknown factors in the predictive mathematical models but inclusion of social sciences will contribute greatly.

The problem of early unlock and re- lock down when Covid incidence curve refuses to slow down contribute negatively to the fight against the virus as people give up social distances and safe practices of mask and sanitization. This has a detrimental effect on health seeking behavior and rise in taking medicine without proper prescriptions due to panic driven health seeking behavior. There is a possibility of COVID- 19 to be harbored in the same hotspots which are the focus of drug resistant pathogens. The same social determinants are drivers of the two coexisting problems. The early clinical symptoms of Corona 19 infection are non- specific illness like body ache, headache, sore throat and loose motion which get wrongful use of antibiotics and over prescriptions without diagnostic testing. This can contribute to the spread and rise of AMR.

Policy change Given the present scenario of Corona 19 symptoms contributing to increase in wrongful use of antibiotics, there is a need for integrating the National Action Plan on AMR with Covid 19 monitoring and surveillance. A ten point strategy is proposed by IPHA which includes increase in budget allocation to strengthen weak health services, water and sanitation with active participation of local representatives and activists. Increased patient awareness about symptoms which do not need the use of antibiotics and promoting good herbal and home based health practices. Better monitoring, awareness of physicians, diagnostic tests and optimal use of antibiotic is envisaged for a better future of medical treatment.

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