EDITORIAL

POST ANTIBIOTIC ERA- THREAT, CHALLENGES AND ACTION PLAN

On December 1, 2017 an article was published in "The Telegraph" one of UK,s leading newspaper based upon the research of office of national statistics of UK and the caption was "Life expectancy has dropped because of antibiotic resistance". This story has come after The World Health Organization (WHO) has already stated said that the phenomenon is "One of the biggest threats to global health".

During the last five decades health care facilities around the globe have experienced the emergence of microorganisms like Methicillin resistant staphylococcus aureus (MRSA), Vancomycin resistant enterococcus (VRE), Extended spectrum beta lactamases (ESBL), Carbapenem resistant Enterobacteriacae (CRE), Carbapenem resistant Acinetobacter baumanni (CRAB) and many more antibiotic resistant microorganisms that microbiologists and clinicians have to memorize the alpha-betical acronyms and abbreviations. Lately the frequency of isolation of Carbapenem resistance in gram negative bacteria in the hospitals and health care settings of South and Southeast Asia has been reported to be extremely high. Likewise countries of South Asia including Pakistan are implicated as the source of New Delhi Metallo β lactamase -1 (NDM-1) gene, which encodes one of the most extensively disseminated carbapenemases in terms of geographic spread and bacterial species[1,2].

World Health Organization has already stated that Antimicrobial resistance (AMR) is posing bigger threat than was Autoimmune deficiency Syndrome (AIDS) in 1980s and it has also warned that by year 2050, approximately ten million people could die of curable diseases. The situation can land us into a post antibiotic era in which we might not have any antibiotic to treat even minor infections. This situation if it arises would be extremely disturbing for hospitals across the globe in general and country like Pakistan in particular. The fact that only handful of new antibiotics have been launched in last decade and very few are in pipeline for future further augments the consequences and concerns of impending threat of post antibiotic era.

Keeping in view the threat of post antibiotic era, many countries have already launched their action plans to combat AMR. Few years ago no less than the President of United States of America chaired a meeting of around one hundred and fifty experts from private and public sectors in White House to devise strategies to control AMR. Likewise on the recommendations of WHO with Global action plan, many countries have adopted their respective action plans such as European strategic action plan on antibiotic resistance, European one health action plan and federal action plan on AMR and use in Canada. This speaks of the magnitude and seriousness on the part of these countries to control this menace. Factors contributing AMR are multifarious and diverse in nature. The prescribing and dispensing factors of antimicrobials, those concerning public, Hospitals, private industry and non-medical anti-biotic use have been discussed and deliberated in recent times.

The way forward lies in finding the tangible and practical steps to control AMR. The two most important players in the quest for control of AMR in Pakistan are the clinicians and microbiologists whose nexus can play a very vital role against this battle. This nexus is important because the clinicians are in contact with patients all the time. They are managing the patients, they are using the antibiotics empirically, therapeutically and prophylactically. Then the clinicians have direct contact with nurses, postgraduate as well as undergraduate medical students and all of them can directly or indirectly contribute positively or otherwise in spread or control of AMR. On the other hand Microbiologists are directly observing what sort of specimens are being submitted to microbiology laboratory, the

antimicrobial susceptibility profile of micro-organisms. In addition they are following the international recommendations in the form of Clinical and Laboratory Standards Institute (CLSI) guidelines and Sanford guide to antimicrobial therapy. So they have the objective evidence with them to guide and steer the clinical colleagues towards right direction.

It has been observed that in hospital settings almost 30-50% of all antimicrobial prescriptions are usually excessive and that occurs because of either inappropriate interpretation or use of microbiological test results, lack of micro-biological confirmed diagnosis, failure to submit appropriate specimen for culture and finally over reliance or disregarding the microbiological results. All these factors can be corrected by close liaison and nexus between clinicians and microbiologists. Likewise when we look at 6 Ds of antimicrobial stewardship and help and assistance provided by microbiology labora-tories, we understand that microbiologists can assist the clinicians in making and documenting the right diagnosis and that can be done by providing guidance to clinicians in obtaining adequate and significant clinical specimen, providing alternate testing of pathogens such as legionella which are difficult to identify with standard microbiology techniques, advising clinicians about availability of rapid molecular tests, timely dispatch of the specimen to reference laboratory and rejecting the inadequate or insignificant samples[3-5]. Similarly as regards debridement and drainage of abscesses the microbiologist can provide guidance to the surgeons as regards adequate and significant specimens and can prioritse the culture of specimens from operating rooms. The microbiologists must make available, revise and publicize the local antimicrobial susceptibility results and then participate in formulating the local guidelines for common infectious syndromes. These steps can help the clinical colleagues in choosing the right antimicrobial empirically, using appropriate dose according to right diagnosis for the right duration. Timely information to the clinicians whenever pathogens like CRE or CRAB are isolated helps in taking appropriate steps for infection control. Finally if de-escalation therapy is considered by clinicians then microbiologists can chip in with information available in microbiology laboratory as regards the type of pathogen and susceptibility profile.

Pathology and microbiology services in Pakistan Armed Forces has traditionally been a role model for other laboratories in Pakistan. It is imperative that Clinical Microbiology laboratories in Armed Forces should take a lead in this very important juncture. It is the need of the hour that microbiologists provide the clinicians with best practices for rapid diagnosis, notify clinicians immediately when critical infections are detected and provide regular patient specific liaison to clinical colleagues. It is mandatory that microbiologists provide the surveillance data on resistance pattern on regular basis to the hospital administration and clinicians.

The microbiologists and clinicians must regularly sit together and draft hospital antibiotic policies based on the local antibiogram and take concise steps to circumvent use of unnecessary and broad spectrum antibiotics by all concerned. Both the microbiologists and practicing clinicians must also strive to take practical, meaningful and concrete steps towards infection control in hospitals. It surely remains herculean but not impossible task to avoid post antibiotic era for which all health care professionals has task at hand.

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Brig (Prof) Irfan Ali Mirza
MBBS, MCPS, FCPS, FRCP (Ire), Ph.D., MCPS-HPE
Consultant Microbiologist & Head of Pathology Department
Combined Military Hospital Lahore &
CMH Lahore Medical College / Institute of Dentistry
Lahore Pakistan
Email: irfanmirza651@hotmail.com