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Initiation of IJMBS

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It gives me a great pleasure to be a small contributor to the first inaugural issue of "International Journal of Medicine & Biomedical Sciences" being published from Nepal with efforts put in by Mr. Sunil Pandey and his team. As the name suggests, this journal is mainly devoted to Biomedical Sciences & Medical sciences and related topics. On this special auspicious occasion I would like to take opportunity to share some of my thoughts.

The medical microbiology revolves around three main areas and topics such as type's infectious diseases, diagnosis methods andtreatment options. Over the past decades, major advances in the field of molecular biology, coupled with advances in multiplex real time PCR technologies have facilitated the development of high performing,innovative, low cost and syndrome based tests for the diagnosis of various bacteria, viruses and parasites with the aid of fast track diagnostics. These technologies are particularly specialised in symptoms based disease approach as different pathogens can cause similar clinical pictures while diagnosed for respiratory infections, gastroenteritis, sexually transmitted infections, fever, rash, childhood infections, hepatitis, meningitis, infections of the immune suppressed, tropical fever and many other infections. Fungal infections are increasing worldwide specially with increase in immune compromised patients. Correct and accurate laboratory diagnosis of fungal infections has become an essential part of the laboratory services.

After achieving success in diagnosis,it's now a turn of a clinician to give most appropriate antimicrobial treatment from the available armament of antimicrobial agents. At this point the gloomy scenario surfaces. Due to ever increasing number of resistant organisms treatment options for clinicians are very limited. Emergence of MRSA, VRSA, ESBL and MBL including NDM1 and so on have made one time considered most powerful antibiotics blunt in action. The number of strains resistant to different antibiotics and their ever increasing number revealed in several publications worldwide are really scary. The situation is really bad in Asian countries. Lot of discussion goes and finally blame points at uncontrolled misuse of antibiotics. Though it is true, there are certain associated socio-economic issues that need to be considered. The clinician is often forced to go for empirical antibiotic treatment due to high cost of susceptibility tests needed to be performed before starting the appropriate antibiotic treatment and moreover even if he wants, it not easily available particularly in rural areas.

Additionally, leading international Pharma companies have either stopped their search for new antibiotics or slowed down and instead prefer to invest in lifestyle diseases such as high blood pressure, diabetes and asthma due to their higher shelf life, unlike that of antibiotics. The safety issues and very high cost of clinical trials coupled with uncertainty of final success have made development of NCEs less rewarding.

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The art of antibiotic discovery from natural sources such as soil is slowly dying out even though it still has a very high potential to reward. Now days it is possible to give outstanding resultstogether with the help of sophisticated and advanced analytical identification tools and database of known antibiotics, not available during the early days of antibiotic research.

Today the countries of the world are fast connected with each other. Any asymptomatic carrier can carry deadly resistant pathogens fromone end of the world to another within less than 24 hours without even his or her knowledge and without any suspect of the regulatory authority. It is very difficult now to stop this spread even in so called isolated advanced countries.

Another reason for immergence of antimicrobial resistance is also need to be equally understood. The suboptimal doses when given during the therapy can create antibiotic levels lower than the Mutant Prevention Concentration (MPC) and thereby give chance to slowly growing resistant subpopulation to grow which then increase in number during the same treatment. It is essential that clinician has knowledge of PK-PD effect of antibiotics and by what parameter the antibiotic acts. These are governed by either Cmax /MIC or AUC/MIC or time above MIC. For example Fluoroquinoles act by Cmax/MIC and therefore a single dose once a day is often recommended whereas beta lactams class of antibiotics need longer time above MIC level to act and hence frequent dosing is practised. Any compromise with these parameters could lead to development of resistant strains.

The five hours short duration incubation in automated susceptibility test is based on development and measurement of optical density. However, resistant mutants which are few in number compared to a large sensitive population fail to impart turbidity and hence the culture is labelled as sensitive. This is a major error in susceptibility testing. To overcome this problem, E-test MIC method is better option since on 24 hr incubation, the resistant mutants that grow in the form of isolated colonies in the zone of inhibition can clearly show their presence. This observation would help clinician to take informed decision at right time to choose a more efficacious and appropriate antibiotic treatment protocol. This is one of the reasons which results in not only creating reservoir of resistant organisms in patient's body and its subsequent spread but could also result in mortality. The national level antibiotic resistance surveillance program if undertaken on regular intervals of time would help draw correct picture of gravity of alarming situation and also to judge the effectiveness of program implemented to control AMR.

It is a joint responsibility of Pharma companies to refrain themselves from introducing irrational antibiotic combinations without understanding the PK –PD of an individual partner. In antimicrobial therapy, the concentration of an individual component at the site of infection when present together during the therapy is critical as observed in in-vitro evaluation experiments. Similarly, MIC results in in-vitro combination study must show MICs of resistant strains falling in the sensitive range as recommended by CLSI guideline.

Researchers have to keep in mind that the outcome of quality research should lead to new findings, better understanding or insight into earlier findings or ideally suggesting a better treatment option. The publication of reconfirmation of known data is sometimes essential. However, these type of publication when very frequently appear in journals do not lead to advancement of science.

Finally I congratulate IJMBS team a good success in this noble endeavour.

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