Editorial

RATIONAL DOSAGE REGIMEN OF ANTIBIOTICS

Antibiotics play an important role in the treatment of various infectious diseases in man and domestic animals. For treating microbial infections effectively, it is essential that an effective concentration of antibacterial drug be rapidly attained at the focus of infection and that it be maintained for an adequate time. The concentration achieved varies with systemic availability of the drug based on its dosage form, dosing rate, routs of administration and ability to gain access to the infection site. The concentration also varies with the physicochemical characteristics of the drug which subsequently influence the extent of absorption, pattern of distribution and elimination mechanisms (pharmacokinetics characteristics). Microbial susceptibility to the drug concentration is also critical aspect for clinical efficacy of an antibiotic. Thus, effective therapy depends on a triad of bacterial susceptibility, pharmacokinetics characteristics of the drug and dosing rate.

The Asian countries have varying topographical and environmental conditions under which a considerable number of human and livestock population is growing. The knowledge relating to human and animal health and diseases is acquired usually from the literature of the western countries where the environmental conditions, the genetic makeup of man and animals even the nutritional conditions are different from those of the Asian countries.

Most of the developing countries like Pakistan are importing raw or finished drugs for their human and veterinary health programs. Drug developments supported by extensive preclinical and clinical investigation are carried out in the drug exporting countries. In most cases the genetic makeup of man and animals and environmental conditions are different amongst the drug importing and exporting countries. Several studies have shown that the pharmacokinetics behavior and optimal dosage of the investigated drugs was different under indigenous conditions when compared with the values given in the literature or in the product inserts supplied by the manufactures. An original term "geonetics" has, therefore, been recently coined to describe the environmental influences on the genetic which are manifested by characteristics biochemical and physiological parameters which ultimately affect the biodisposition and fate of drugs in a population (Nawaz and Shah, 1985).

Such geonetical influences have been reported for blood and urine pH, blood proteins, drug metabolism and kidney function in human beings and different species (Nawaz et., 1988). From these studies it may be concluded that biochemical milieu interior and physiological parameters are influenced by geonetical conditions which ultimately affect the disposition kinetic, fate and are likely to affect response to the drugs. Several investigations in animal models and human

volunteer have shown that biodisposition of certain drugs i.e. sulfonamides and antibiotics under indigenous geonetical conditions is different from the disposition recorded elsewhere (Nawaz & Khan, 1979, Nawaz et al., 1989). Therefore, it is imperative that an optimal dosage regimen should be based on the pharmacokinetics data determined in the species and environment in which a drug is to be employed clinically.

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REFERENCES:

1. Nawaz, M. and F.H. Khan (1979). Pharmacokinetics and urinary excretion of sulfadimidine in sheep and goats. J. Vet. Pharmacol. Therapy., 2. 129-132.
2. Nawaz, M. & B.H. Shah (1985). Geoneitical consideration in the quality assurance of pharmaceuticals. Proc. Int. Seminar on policies, mangarment and quality Assurance of Pharmaceuticals Ministry of Health, Islamabad 21st -25th April, 1985, Karachi. Pakistan.
3. Nawaz, M., T. Iqbal & R. Nawaz (1988). Geonetical considerations in disposition kinetics evaluation of chemotherapeutic agents. Vet. Pharmacol. Toxicol. & Therapy in Food Producing Animals. Vol. 2, p-260, Proc. 4th Cong. Assoc. Vet. Pharmacol. Therap..28th August – 2nd September, Budapest.

   Nawaz, M., Hafeez, F.H. Khan, R. Nawaz and T. Iqbal (1989): Bioavailability, Disposition kinetics and renal clearance of ampicilline following three routs of administration in sheep. J. Vet. Med. A., 36, 84-89.