

Developmental Pharmacokinetics

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Physiological differences between children and adults result in age-related differences in pharmacokinetics and drug effect. The advances in developmental pharmacokinetics during the past decade lead to enhanced understanding of the influence of growth and development on pharmacokinetics. Understanding the role of ontogeny in the disposition and actions of drugs is essential for safe and effective paediatric pharmacotherapeutics. The maturation process involves continuous growth, differentiation, and development of the organs. Developmental changes in physiology and, consequently, in pharmacology influence the efficacy, toxicity, and dosing regimen of drugs. The most dramatic changes occur in excretory organs (liver and kidney) during the first days to months of life which has greatest impact on drug disposition. Gastrointestinal function changes rapidly during the first few days after birth affecting absorption of orally administered drugs. As body composition changes with development, the distribution volumes of drugs are also changes. Levels of plasma proteins also vary in children which also has impact on volume of distribution. Failure to take these factors into account may result in ineffective treatment or severe, unexpected toxicity.

Pediatric drug dosage regimens should take into account the age or developmental state of the child and the disease state, rather than simply scaling an adult dose based on body weight or surface area. Ideally, pharmacokinetic and pharmacodynamic data should be available for all drugs used in children. Fatal adverse effects could be avoided by performing clinical trials in paediatric population during the drug development process before the widespread use of drugs in children.

Biography

Mukta N. Chowta has completed her MBBS in 1989 from Kasturba Medical College under Mangalore University and MD in Pharmacology also from the same institution under MAHE, Manipal. She is presently working as Associate Professor of Pharmacology at Kasturba Medical College, Manipal University. She was also associated with Manipal Acunova as medical pharmacologist and was involved in various clinical trials on diabetes mellitus, hypertension, infectious diseases and in many oncology trials. She has published more than 30 papers in reputed journals, co-authored a book on practical pharmacology and presented papers in various national conferences.

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