INVITED SPEAKERS

SYMPOSIUM - Implications of in vitro and Human Volunteer Studies for Decontamination of Overdose Patients

When using activated charcoal as gastrointestinal decontamination in human poisoning, information of its maximum adsorption capacity for the specific toxic substance ingested theoretically permits calculation of an adequate activated charcoal dose assuming that the amount of drug ingested is known. Maximum adsorption capacity studies are in-vitro studies performed in the laboratory using equipment and methods mimiking the human gastrointestinal tract. Direct extrapolation to human settings is challenging as the ideal in-vitro environment is replaced with the varying environment of the human gastointestinal tract. Multiple factors may interfere with the adsorption capacity of the activated charcoal to form a complex with a toxic substance. Co-ingestions of food and beverage may change gastric pH compared to laboratory settings and reduce the adsorption capacity of the activated charcoal, but may also reduce gatric motility increasing the contact time between the toxic substance and the activated charcoal and promoting the complex formation and thereby reduced absorption of the toxic compound. The development of pharmaceutical preparations designed to increase treatment profile and patient compliace further challenge the risk assesment in the poison centre guidelines for the poisoned patients. A range of pharmaceutical preparations are prone to form gastric pharmacobezoars, durable for a long period of time and difficult to break or eliminate.

Through in vitro studies, designed to explore the limits of activated charcoal, and simulated overdose studies in human volunteers however increase our knowledge on the mechanism of action and efficacy of activated charcoal and may aid in the clinical discision when to incude activated charcoal in the treatment of a poisoned patient.