



Adsorption of Paracetamol on Activated Charcoal in The Presence of Dextropropoxyphene Hydrochloride, N-Acetylcysteine and Sorbitol

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SUMMARY. Paracetamol, an over the counter analgesic and antipyretic drug, causes hepatic and renal tubular necrosis at higher doses ingested accidentally, or intentionally. The situation worsens clinically upon the ingestion of product containing paracetamol and dextropropoxyphene. In paracetamol poisoning, activated charcoal is used to adsorb the drug from the gastrointestinal tract, sorbitol to remove charcoal-drug complexes and N-acetylcysteine to reduce the drug and its metabolites from systemic circulation. Activated charcoal being non-specific adsorbent may adsorb other chemical moieties from the intestine as well as antidotes. Therefore, the present study aimed to investigate the adsorption of paracetamol on activated charcoal in presence of dextropropoxyphene hydrochloride, N-acetylcysteine and sorbitol. Paracetamol was combined separately with dextropropoxyphene hydrochloride, N-acetylcysteine and sorbitol. These mixtures were combined with varying amounts of activated charcoal to evaluate the *in vitro* adsorption of paracetamol using Langmuir Isotherm. Paracetamol adsorption was 96.6 % at charcoal-drug ratio (6:1) while only 2 % higher in 8:1 and 2.9 % in 10:1. The binding constant (K₂), maximum adsorption capacity per gram of activated charcoal for paracetamol alone and in presence of dextropropoxyphene hydrochloride, N-acetylcysteine and sorbitol was found to be 366, 339, 313 and 355 mg/g, respectively. The results of the present study indicate that except sorbitol other investigated substances significantly reduce the adsorption of paracetamol on activated charcoal, which may be compensated by increasing the concentration of activated charcoal.

KEY WORDS: Paracetamol, Activated charcoal, Dextropropoxyphene, N-acetylcysteine, Sorbitol.

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