



Editorial

IS IT POSSIBLE TO FORECAST FOOD DRUG INTERACTION?

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Most people have the mistaken belief that being natural, all herbs and foods are safe. It cannot be said to be true. The herbs and foods may interact with medications taken, that may result in serious side reactions. For the simple reason that like oral medication, food and herbs also traverse the same gastrointestinal path. Hence co-administration of drugs and food/herbs may affect the absorption of the drugs by altering gastric pH, secretion, gastrointestinal motility and transit time; and consequently therapeutic efficacy (1).

In order to understand drug-food / drug-nutrition interaction, it is important to understand the ADME of the drug in question (2). The impact of drug-food interaction can be assigned to multitude of factors namely, age, weight, sex and state of health of the person; dosage of the drug and the time of administration of the interacting components. Sufficient information about the drug and the timing of medication around food intake can help avoid drug-food interaction (3). Food may alter hepatic metabolism of some drugs. The flavonoids in grapefruit juice inhibit cytochrome P 450 metabolism of antihypertensives namely felodipine and nifedipine causing enhanced bioavailability (4). This interaction could increase both the efficacy and toxicity of the drugs. There is potential clinical significance, because citrus juices are frequently consumed in breakfast when many medications are taken. Apart from interference in absorption, the foods may alter the urinary pH, which may affect the activity of certain drugs that may influence excretion and hence the half-life. The half-life of an acidic drug will be extended in acidic urinary pH whereas it would be reduced in alkaline urine. Foods such as milk, vegetables, etc. may alkalinize the urine whereas meats, fish, cheese and eggs can acidify the urine.

Foods may interact with medications by altering their pharmacologic actions. Diets high in vitamin K (turnip greens, green tea, cauliflower, spinach, broccoli, brussels sprouts, chickpeas, pork liver, beef liver) may cause antagonism of warfarin and decrease its therapeutic efficacy (5). As stated the timing of administration is very important to avoid drug food interaction. For example to avoid interaction, calcium rich dairy products and calcium supplements should be taken two hours before or six hours after administration of fluoroquinolones (ciprofloxacin, norfloxacin)/ tetracyclines/ biphosphonates(alendronate, risedronate & ibadronate).

When fruit juices or vegetables are co-administered with drugs, interaction at pharmacokinetic level is possible. The drug-phytochemical interaction may not be manifested as therapeutic failure but certain adverse events may take place. For e.g. grape juice blocks cytochrome P 450 and IA2 (CYP3A4 and CYO1A2) in intestinal area; hence should not be taken with certain antihypertensive drugs and cyclosporine as it may lead to higher levels of drugs (6). Thus the interactions need to be well defined.

Extensive research inputs are needed for identification of this kind of interactions. Possibly some alterations/ evolution of drug release test methodologies may be seen as methods to forecast the interactions. In future, this may become integral part of new drug approval process. However, in the current scenario, a pharmacist can help avoid drug-food interactions by practicing proactively.

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