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Pharmacokinetic Interactions between Drugs and Botanical Dietary Supplements.

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Abstract

The use of botanical dietary supplements has grown steadily over the last 20 years despite incomplete information regarding active constituents, mechanisms of action, efficacy, and safety. An important but underinvestigated safety concern is the potential for popular botanical dietary supplements to interfere with the absorption, transport, and/or metabolism of pharmaceutical agents. Clinical trials of drug-botanical interactions are the gold standard and are usually carried out only when indicated by unexpected consumer side effects or, preferably, by predictive preclinical studies. For example, phase 1 clinical trials have confirmed preclinical studies and clinical case reports that St. John's wort (*Hypericum perforatum*) induces CYP3A4/CYP3A5. However, clinical studies of most botanicals that were predicted to interact with drugs have shown no clinically significant effects. For example, clinical trials did not substantiate preclinical predictions that milk thistle (*Silybum marianum*) would inhibit CYP1A2, CYP2C9, CYP2D6, CYP2E1, and/or CYP3A4. Here, we highlight discrepancies between preclinical and clinical data concerning drug-botanical interactions and critically evaluate why some preclinical models perform better than others in predicting the potential for drug-botanical interactions. Gaps in knowledge are also highlighted for the potential of some popular botanical dietary supplements to interact with therapeutic agents with respect to absorption, transport, and metabolism.

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