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Pediatric Dietary Supplement Use—An Update

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Dietary supplements represent a body of products as diverse as any hospital formulary. Although health care providers may receive little education about these products, dietary supplement use among pediatric populations is rapidly growing.. This report reviews the specific reasons why caregivers and patients may choose alternative remedies and discusses the importance of screening pediatric patients for dietary supplement use. In addition, potential toxicities of dietary supplements are reviewed, with an emphasis on special hazards to children and adolescents. Common herb-drug interactions are also discussed.
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The term "complementary" or "alternative" medicine (CAM) encompasses many modalities, including dietary supplements, prayer, acupuncture, aromatherapy, massage, chiropractics, and hypnosis. Dietary supplements represent a body of products that are as diverse as any hospital formulary. Unfortunately, most providers receive little formal education on dietary supplements and their implications for patients.

This article focuses on dietary supplements, the area of CAM that currently poses the greatest risk for patient morbidity. The term "dietary supplement" includes alternative remedies derived from herbs, other plants or trees, vitamins, amino acids, minerals, and essential oils. Henceforth, herb-derived dietary supplements will be referred to as herbals, whereas plant-derived dietary supplements will be called botanicals. It is clear that the prevalence of herbal use is growing. In 1997, a telephone survey estimated that 12.1% of adults in the United States had used herbal medicines in the previous year, compared with 2.5% in a similar population in 1990 [1].

Most research into dietary supplement use has focused on adults. However, a recent review of poison center data describing symptomatic exposures to dietary supplements showed that 47% occurred in children [2]. Thus, all clinicians who care for children must be familiar with a basic approach to dietary supplement use, populations at risk, specific applications of supplements by patients, and recognized toxicities. A chart included with this article describes in more detail the use and potential adverse effects of several popular dietary supplements (Table 1).

Why Are Children Taking Supplements?

With the ever-growing popularity of CAM in developed countries, many studies have investigated the rationale that drives patients to seek out alternative therapies. Several studies have documented the belief by the public that "natural" is equivalent to "safe" [22]. These studies also reveal a lack of public awareness about the adverse effects of dietary supplements, including those that occur because of interactions with other prescription or over-the-counter medications. Patients may turn to CAM for increased autonomy in treatment decisions and often use remedies suggested by other family members and friends [1,2].

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Table 1 Uses and adverse effects of some common dietary supplements.

Dietary Supplement	Plant/ Synonym	Purported Uses	Adverse Reactions	Herb-Drug Interactions
Aloe [3]	*A vera*	Wound healing General "tonic" Laxative	Dermatitis GI upset after ingestion	None reported
Bitter orange [4]	*C aurantium*	Weight loss, bodybuilding aid	Tachyarrhythmias, associated with myocardial infarction	May have increased toxicity when taken with caffeine
Echinacea [5]	*Echinacea purpurea*	Immune stimulation, tonic Often used in upper respiratory infections	Hypersensitivity reactions Anaphylaxis	Theoretical risk of decreasing effectiveness of immunosuppressant therapies
Ephedra [6]	Ma Huang	Stimulant, weight loss aid Recreational drug Treatment of asthma	Hypertension Stroke Myocardial infarction Dysrhythmias Seizures, death	Potentiation of other CNS stimulants
Feverfew [7,8]	*Tanacetum parthenium*	Migraine therapy	GI upset, antiplatelet activity	May increase bleeding risk with anticoagulation
Garlic [9,10]	*Allium sativum*	Lowers cholesterol and blood pressure Delays atherosclerosis	GI upset, rash Spontaneous and intraoperative bleeding (may be secondary to antiplatelet effect)	Unclear risk of interaction with warfarin
Gingko [11,12]	*G biloba*	Increases memory Improves circulation	GI upset, rash Antiplatelet activity, reports of association with spontaneous hyphema and subdural hematomas	May potentiate MAOIs May increase bleeding risk with anticoagulation
Ginseng [13,14]	Panax ginseng	"Cure-all"	GI upset, hypertension, insomnia, mastalgia, vaginal bleeding, hypoglycemia	Decreases effectiveness of warfarin, may cause mania when taken with MAOIs should not be used with other hypoglycemic agents
Goldenseal [15]	*Hydrastis canadensis*	Treatment of irritable bowel syndrome Urinary tract infection prophylaxis Purported to mask urine drug screens	Reportedly causes GI distress, GI ulcers and seizures in large doses	Potential for interactions secondary to inhibition of multiple CYP isoenzymes
Guarana [6]	*Paullinia cupana* "*natural caffeine*"	Stimulant, weight loss aid	Same toxicity as caffeine, including vomiting, tachydysrhythmias, seizures	Potentiation of other CNS stimulants, particularly ephedra
Kava kava [16-18]	*Piper methysticum*	Anxiolysis	Sedation, hepatotoxicity	Increased CNS depression with benzodiazepines; potential for many drug interactions via inhibition of multiple CYP isoenzymes
St. John's Wort [19,20]	*Hypericum perforatum*	Antidepressant	Photosensitivity Headache Anxiety GI upset	May cause serotonergic effects if taken with MAOIs or SSRIs, many drug interactions, potent inducer of CYP 3A4, may decrease efficacy of oral contraceptives
Valerian root [8,21]	*Valeriana officianalis*	Anxiolysis, sedation	Rare adverse effects, may have withdrawal syndrome similar to benzodiazepines	May cause increased CNS depression in use with alcohol and barbiturates

MAOIs indicates monoamine oxidase inhibitor; SSRIs, selective serotonin reuptake inhibitors.