Herb-Drug Interaction

Herb Review

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Basic Concept and Understanding of Interaction

- Pharmacokinetic Interaction
- Pharmacodynamic Interaction

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Pharmacokinetic Interactions

- Absorption
- Distribution
- Metabolism
- Elimination

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Absorption

- Describes process of physical passage of herbs drugs from outside to inside of body.
- Mostly occurs in intestines: must pass through intestinal wall to enter bloodstream.

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- Absorption can be hindered by
- Binding in the Gastrointestinal Tract
- Change in pH in the Stomach
- Change in Intestinal Motility

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Binding in the GI Tract

- Drugs may bind to herbs
- Forms insoluble complex; molecules are too big to be absorbed through intestinal wall
- Questran (cholestyramine)
- Colestid (colestipol)
- Xenical (orlistat)

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pH in the stomach

- Stomach acid needed to break down herbs for digestion, so take herbs ~2 hrs away from these drugs:
- Antacid: Maalox, Mylanta, Tums
- Histamine-2 Receptor Antagonist: Tagamet (cimetidine), Pepcid (famotidine), Axid (nizatidine), Zantac (ranitidine)
- Proton Pump Inhibitor: Prilosec (omeprazole), Nexium (esomeprazole), Pravacid(lansoprazole), Protonix (pantoprazole)

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Intestinal Motility

- Drugs that increase intestinal motility may decrease absorption (may need to increase dose of herbs)
- Example: Reglan (metoclopramide)

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Intestinal Motility

- Drugs that decrease intestinal motility may increase absorption (may need to decrease dose of herbs)
- Example: Haldol (haloperidol)

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Absorption Interactions

- Solution: Take herbs and drugs separately by 2-4 hours

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Distribution

- Two factors that contribute to Distribution Interactions:
- Narrow range of safety index
- Highly protein bound

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Distribution

- Narrow range of safety index
- Highly protein bound
- Coumadin (warfarin)
- Dilantin (phenytoin)

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Distribution

- Problem: Difficult to impossible to predict interactions
- Solution: Initiate the herbs at a lower dose;
- Gradually increase the dose of the herbs;
- Monitor the patient closely

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Metabolism

- Liver Enzyme Inducer:
- Increased metabolism of herbs/drugs
- Decreased therapeutic effect
- Liver Enzyme Inhibitor:
- Decreased metabolism of herbs/drugs
- Increased therapeutic effect

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Metabolism

- Liver Enzyme Inducer:
- Dilantin (phenytoin), Tegretol (carbamazepine), phenobarbitals, pentobarbital, secobarbital, rifampin

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Metabolism

- Liver Enzyme Inducer:
- Increased metabolism of herbs/drugs
- Decreased therapeutic effect (may need to increase herb dosage)
- Gradual onset of enzyme induction
- (takes about 1-2 months before effect is observed)

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Metabolism

- Liver Enzyme Inhibitor:
- Tagamet (cimetidine), E.E.S. (erythromycin), Alcohol (ethanol), Diflucan (fluconazole), Sporonox (itraconazole), Nizoral (ketoconazole)

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Metabolism

- Liver Enzyme Inhibitor:
- decreased metabolism of herbs/drugs
- increased therapeutic effect (may need to decrease herb dosage)
- Rapid onset of enzyme inhibition (takes about 2 weeks before effect is observed)

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Elimination

- Nephrotoxic drugs (lower dose of herbs to prevent possible side effects):
- amphotericin B
- methotrexate
- tobramicin
- gentimicin

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Elimination

- Nephrotoxic herbs:
- Guang Fang Ji (Radix Aristolochiae Fangchi)
- Guang Mu Tong (Caulis Aristolochiae Manshuriensis)
- Ma Dou Ling (Fructus Aristolochiae)
- Qing Mu Xiang (Radix Aristolochiae)
- Xi Xin (Herba Asari)

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Drug-Drug Interactions

- Synergistic Effect with Drugs
- Bactrim (sulfamethoxazole and trimethoprim)
- Augmentin (amoxilicillin & clauvulanate p.)
- Vicodin (hydrocodone & acetaminophen)
- Tylenol #3 (codeine & acetaminophen)
- cocktail approach to treating HIV & cancer.

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Drug-Drug Interactions

- Antagonist effect with drugs
- tetracycline with iron
- activated charcoal with food

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Herb-Herb Interactions

- Synergistic Effect with Herbs
- Shi Gao (Gypsum Fibrosum) + Zhi Mu (Radix Anemarrhenae)
- Ru Xiang (Gummi Olibanum) + Mo Yao (Myrrha)
- Tao Ren (Semen Persicae) + Hong Hua (Flos Carthami)
- Many other combinations (Mutual Accentuation/Enhancement principle)

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Herb-Herb Interactions

- Antagonist Effect with herbs
- Ren Shen (Radix Ginseng) + Wu Ling Zhi (Excrementum Trogopteri)
- Ren Shen (Radix Ginseng) + Lai Fu Zi (Semen Raphani)
- 18 Incompatibilities / 19 Antagonisms

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General Interactions

- Anticoagulants / Antiplatelets
- Diuretics
- Antidiabetics
- Sedatives / Hypnotics
- Specific Interactions

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Herbs with anticoagulant effects

- Dan Shen(Rx Salviae Miltiorrhizae)
- Dang Gui (Rx Angelicae Sinensis)
- Chuan Xiong (Rz Ligustici Chuanxiong)
- Tao Ren (Sm Persicae)
- Hong Hua (Fl Carthami)
- Shui Zhi (Hirudo)
- Caution w/ anticoagulant or antiplatelet drugs

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Coumadin (warfarin)

- Anti-coagulant medication
- Blocks the re-cycling process of vitamin K
- Slow onset of action, long duration of action
- Lab monitor with INR (International Normalization Ratio)
- Symptom/Sign monitor with possible bleeding/bruises or clotting

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Coumadin (warfarin)

- Over 1000 interactions documented
- Potential interaction with any other anti-coagulant or anti-platelet drugs
- Potential interaction with OTC drugs, dietary supplements, and food
- Potential adverse reaction with acupuncture
- Potential interactions with Chinese herbs

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Diuretic Herbs

- Fu Ling (Poria)
- Zhu Ling (Polyporus)
- Che Qian Zi (Semen Plantaginis)
- Ze Xie (Rhizoma Alismatis)
- Caution with diuretic drugs

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Antidiabetic herbs

- Zhi Mu (Radix Anemarrhenae) and Shi Gao(Gypsum Fibrosum)
- Xuan Shen (Radix Scrophulariae) and Cang Zhu (Rhizoma Atractylodis)
- Huang Qi (Radix Astragali) and Shan Yao(Rhizoma Dioscoreae)
- Use with caution with antidiabetic drugs

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Shen Calming Herbs

- Herbs that calm shen often potentiate the sedative effect of sedative / hypnotic drugs.
- [Note: Many categories of drugs induce sedation, such as antihistamines, narcotic analgesics, barbiturates, benzodiazepines and others.]

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Ma Huang (Herba Ephedrae)

- Ma Huang contains ephedrine alkaloids that stimulate the central nervous system and the cardiovascular system.
- Combining Ma Huang with cardiac glycosides may lead to cardiac arrhythmia.

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Ma Huang (Herba Ephedrae)

- Ma Huang should not be combined with other sympathomimetic drugs, such as ephedrine, pseudoephedrine, theophylline, caffeine, monoamine oxidase inhibitors(MAOI), or substances with similar properties.

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Ma Huang(Herba Ephedrae)

- The effect of beta blockers may be reduced when combined with Ma Huang because of increased levels of norepinephrine caused by the herb.
- [Note: Examples of beta blockers include atenolol (Tenormin), metoprolol (Lopressor/Toprol), sotalol (Betapace), propranolol (Inderal), and labetalol(Normodyne/Trandate).]

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Xiao Chai Hu Tang (Minor Bupleurum Decoction)

- Interferon: Increased risk of acute pneumonitis may be associated with use of interferon, Xiao Chai Hu Tang, or both in combination.
- Among patients with chronic hepatitis or liver cirrhosis, the frequency of drug-induced pneumonitis was:
- 0.5% in those given only interferon-alpha
- 0.7% in those given only Xiao Chai Hu Tang
- 4.0% in those given both

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Huang Qin (Rx Scutellariae)

- Antibiotics: Concurrent use of baicalin, a flavone isolated from Huang Qin, was found to have synergistic antibiotic effect with beta-lactam antibiotics, such as ampicillin, amoxicillin, methicillin and cefotaxime.
- The addition of baicalin restored the effectiveness of these drugs against beta-lactam-resistant Staphylococcus aureus and methicillin-resistant Staphylococcus aureus (MRSA).

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Cross-allergy

- Da Qing Ye(Fm Isatidis), Ban Lan Gen (Rx Isatidis) and Qing Dai (Indigo Naturalis)
- Sulfonylureas: tolbutamide (Orinase), glipizide (Glucotrol), and glyburide (DiaBeta/Micronase)
- Sulfonamides: sulfadiazine, sulfisoxazole, sulfamethoxazole, trimethoprim/sulfamethoxazole (Bactrim/Septra), and erythromycin/sulfisoxazole (Pediazole).

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Fu Zi (Rx Aconiti Lateralis Praeparata)

- Antiarrhythmics: Patients who have a past history of cardiovascular disorders or are taking antiarrhythmic medications should take Fu Zi (also Chuan Wu, Cao Wu) with extreme caution.
- [Note: Examples of antiarrhythmics include quinidine, procainamide (Pronestyl), disopyramide (Norpace), flecainide (Tambocor), propafenone (Rythmol), and amiodarone (Cordarone).]

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