Breastfeeding Grand Rounds

May 13, 1999
7:30 – 9:30 a.m.

Agenda

I.	Welcome and Introduction	
II.	Drugs, Herbs & Breastfeeding	Ruth A. Lawrence, M.D.
III.	Breastfeeding and the Workplace	Mary Applegate, M.D., M.P.H.
IV.	Case Studies	Drs. Lawrence and Applegate

Participant questions will follow each case study:

Call: 1-888-313-4822 (toll free) or
Fax: 518-629-8136

Major support for this program comes from the New York State Department of Health and the USDHHS Maternal and Child Health Bureau.

Presented by
New York State Institute for Human Lactation
jointly sponsored by the New York State Department of Health
And
The School of Public Health, University at Albany, SUNY

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Ruth A. Lawrence, M.D.
Mary Applegate, M.D., M.P.H.

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Part of the

Women's Health Grand Rounds Series

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The School of Public Health, University at Albany, State University of New York

Today's Topics:

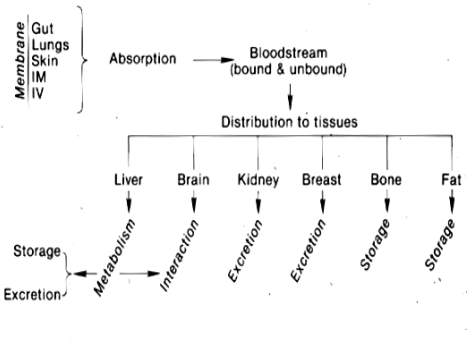
Drugs, Herbs and Breastfeeding: When to Worry

Breastfeeding and the Workplace

Drugs, Herbs, and Breastfeeding

When To Worry

Ruth A. Lawrence, M.D.



Drug

- pKa (ionization at plasma & milk pH)
- Solubility characteristics in fat & water
- Protein binding characteristics
- Molecular weight

Distribution Ratios

Drug Concentrations in Milk and Plasma

	Milk/Plasma Ratio
Highly lipid soluble drugs	≈ 1
Small (mol. wt. <200) water soluble drugs	≈ 1
Weak acids	≤ 1
Weak bases	≥ 1
Actively transported drugs	> 1

Milk/Plasma Ratios and pK_a of Sulfonamides

Sulfonamide	Milk/Plasma Ratio	pK_a
sulfacetamide	0.08	5.4
sulfadiazine	0.21	6.5
sulfathiazole	0.33-0.5	7.1
sulfamethazine	0.51	7.4
sulfapyridine	0.5-1.0	8.4
sulfanilamide	0.5-1.0	10.4

Maternal Pharmacology

- Drug Dose, Frequency, & Route
- Clearance Rate
- Plasma Protein Binding
- Metabolite Profile

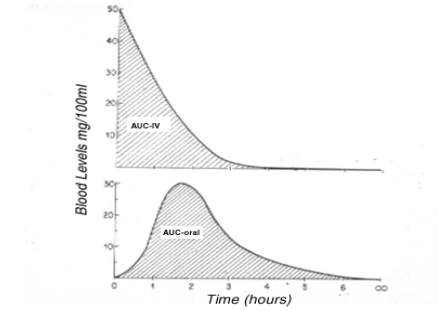


Figure 5. Mean blood levels and area under blood level versus time curve after intravenous oral administration of a hypothetical drug.

Factors Influencing Drug Effect on Infant

- Is it absorbed from GI Tract?
- Has it been changed to an inactive metabolite?
- Does the infant:
  - Detoxify?
  - Excrete?
  - Store?

Infant Factors Influencing Drug Effect

- Age and Maturity of Infant
- Frequency of Feeding
- Volume of Milk Consumed
- Other Diet than Milk

Substances that May Accumulate in the Neonate

- Phenytoin
- Barbituates: Phenobarbital, Pentobarbital
- Caffeine, Theophylline
- Diazepam
- Phenothiazines: Chlorpromazine, Promethazine
- Antihistamines: Diphenhydramine, etc..
- Local Anesthetics: Lidocaine, Carboncaine, Bupivacaine
- Salicylic Acid

Drugs Which Displace Bilirubin From Serum Albumin

- Salicyclic Acid
- Sulfonamides
- Furosemide
- Phenylbutazone

Feeding Variables to be Considered When Mother is on Medication

- Suckling behavior including equal time on each breast
- Amount consumed per feeding
- Feeding intervals (regular or irregular)
- Time of feeding in relation to maternal dosing

Risk: Benefit Ratio

Categories of Drugs by Risk
(AAP Classification)

- **Contraindicated drugs (Category I)**
- **Drugs of abuse (Category II)**
- **Temporary cessation of breastfeeding (pump and discard milk) (Category III)**
- **Pharmacologic properties that guide decision making when the drug has not been studied during lactation**

Drugs That Are Contraindicated During Breastfeeding

Bromocriptine	**Ergotamine**
Cocaine	**Lithium**
Cyclophosphamide	**Methotrexate**
Cyclosporine	**Phencyclidine (PCP)**
Doxorubicin	**Phenindione**

AAP Pediatrics 93:137, 1994

Drugs of Abuse: Contraindicated During Breastfeeding

- Amphetamine
- Cocaine
- Heroin
- Marijuana
- Nicotine (smoking)
- Phencyclidine

AAP Pediatrics 93:137, 1994

Radioactive Compounds That Require Temporary Cessation of Breastfeeding

- Copper 64 (Cu)
- Gallium 67 (67Ga)
- Indium 111 (111In)
- Iodine 123 (123I)
- Iodine 125 (125I)
- Iodine 131 (131I)
- Radioactive sodium
- Technetium-99m (99mTc)
  - 99mRcmacroaggregrates
  - 99mTc04

AAP Pediatrics 93:137, 1994

If Taken As One Dose: Pump And Discard

Breastfeeding and Thyroid Disease

- Hypothyroidism
- Hyperthyroidism

Breastfeeding and Maternal Hypertension

Beta Blockers during Lactation

Drug	Maternal Dose (% to infant)
acebutolol	3.5
atenolol	5.7 - 19.2
labetalol	.07
mepindolol	1.1
nadolol	5.1
oxprenolol	0.5 - 1.5
propranolol	0.2 - 0.9
sotalol	22

Risk:Benefit Ratio

Pharmacologically Active Materials in the Diet

- **Caffeine**
- **Herbal Teas**

Echinacea augustifolio

ECHINACEA

The Native Americans used echinacea, also known as "purple coneflower," for snakebites, fevers, and wounds. The herb soon became popular with early settlers; today it is appreciated as an important immune stimulant and antibacterial, ideal for almost any sort of infection.

PARTS USED: root

KEY USES: Whenever there is infection - viral, bacterial, or fungal - echinacea has a role. It is the ideal choice for colds, flu, and kidney infections and can be helpful in viral based arthritis and sore throats. It can also be applied externally for some skin conditions.

Echinacea

Use: Treatment of common cold
Immune system enhancement

Active Ingredient: 1, 2-D-fructofuranosides; product standardized to contain 2.4% active principle

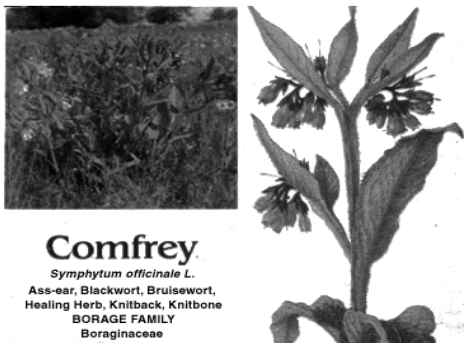
Action: Activation macrophages

Route: Oral and by injection

Toxicity: None known

Herbs For Nipple Problems

- Comfrey root ointment
- Yarrow leaf ointment
- Squaw vine (Mitchella repens)



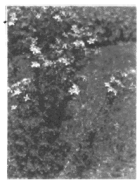
Herbs for Engorgement / Mastitis

A. Oral Options
   1. Echinacea
   2. Polk root

B. Topicals - Soaks, Compresses & Poultices
   1. Cabbage leaves
   2. Parsley leaf compress
   3. Comfrey leaf compress
   4. Raw potato poultice

Herbs as Galactagogues

- Fenugreek seeds
- Marshmallow root
- Cotton root
- Lemongrass oil
- Lemon verbena
- Hops

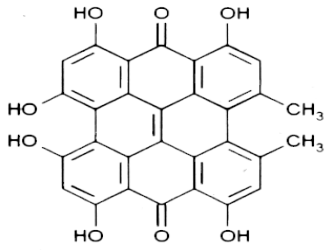


St. John's Wort

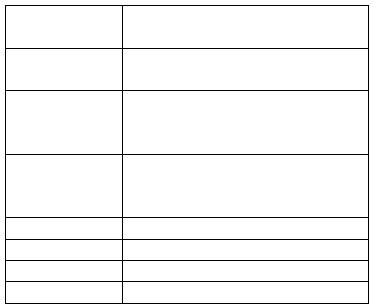
Hypericum perforatum L.

Amber Touch-and-heal, Goatweed
Klamath Weed, Rosin Rose
ST. JOHN'S WORT FAMILY
Hypericaceae

Hypericin



St. John's Wort Chemicals



St. John's Wort

Active Ingredient: hypericum perforatum

Hypericin is a reddish dianthrone pigment

Preparation: variable % of hypericum

Peak plasma cone: 6 hours

Volume of distribution: 162 L

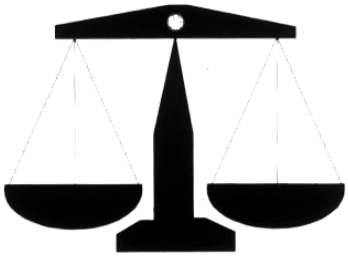
Elimination half life: 10-37 hours

St. John's Wort
Clinical Uses

- **Antidepressant - mild to moderate depression**
  Causes: MAO inhibition
  - **Serotonin re-uptake inhibition**
  - **Norephinephrine re-uptake inhibition**

  Dosing range - 200-1000 mg/day (100-500 mg/day extract)
- **Anti-retroviral - ? Synergistic to AZT**

RISK: BENEFIT



Herbal Diuretics

Safest & most effective:	**caffeine, theobromine**
Safe but ineffective:	**dandelion root, quack grass**
Toxic but effective:	**juniper berries** **horsetail, ephedine or Mormon tea: diuretic and stimulant**

GINSENG ROOT
Metabolic Effects:

- ↓ blood glucose
- ↓ serum cholesterol levels
- ↑ erythropoiesis and iron absorption
- ↑ blood pressure and heart rate
- ↑ GI motility
- ↑ CNS stimulation

Ginseng Abuse Syndrome (Gas)

- Average daily dose 3 g of root
- Ingested (capsule, extract or tea) or smoked
- Effect: stimulation
- Increase motor and cognitive performance
- Side effects: hypertension, diarrhea, nervousness, insomnia
- Inconsistent quality and quantity
- Habituating/withdrawal syndrome

Herbal Toxic Syndromes

- Ginseng Root
- Penny Royal
- Chamomile Tea
- Pokeweed
- Jimson Weed
- Oleander
- Pyrrolizidine Alkaloids
- Hepatotoxic herbal preparations

Risk:Benefit Ratio

Minimizing the Effect of Maternal Medication

- Do not use long-acting form of drug
- Choose drug that produces least amount in the milk.
- Schedule doses so least amount gets into the milk.
- Watch infant for any unusual signs or symptoms.

All Things In Moderation

Except Known Toxins

Breastfeeding Support in the Workplace

Breastfeeding Grand Rounds 1999

Mary Applegate, MD MPH

Breastfeeding & Work

- **Barriers to initiation of breastfeeding**
  - **early return to work**
  - **? combine work and breastfeeding**
  - **? stop soon after starting**

Breastfeeding & Work

- **Barriers to continuing breastfeeding**
  - **inadequate time, inflexible schedules**
  - **no support for breastfeeding**

Why Support Breastfeeding?

- **Lower medical costs**
  - **Fewer hospitalizations**
  - **Lower pharmacy costs**

Why Support Breastfeeding?

- **Increased worker productivity**
  - **Fewer absences**
  - **Greater loyalty and morale**
  - **Recruitment and retention**

Cost Effectiveness

- **Washington Business Group on Health**
- **Babies, Business and the Bottom Line**

Cost Effectiveness

- **LA Department of Water and Power**
  - **each dollar spent saved $3.50 to $5**
- **Aetna**
  - **$1435 saved per breastfed baby**
  - **3:1 cost savings**

Workplace Strategies

- **Time**
- **Space**
- **Support**

Workplace Policies

- **Visibly promote breastfeeding**
- **Health benefits covering:**
  - **postpartum home visits**
  - **lactation consultant services**

Workplace Policies

- **Maternity leave -- 6 weeks minimum**
- **Flexible hours and breaks**
- **Infants on site**

Workplace Facilities

- **On-site child care**
- **Lactation room**
  - **comfortable, clean, private**
  - **electric pump, sink, refrigerator**
  - **resource center: books, pamphlets, videos**

Workplace Services

- **Breastfeeding classes addressing concerns about work and breastfeeding**

Workplace Services

- **Staff Lactation Consultant**
  - **classes and individual counseling**
  - **manage lactation facilities**
  - **products (pumps, pump kits, coolers, books)**

Workplace Services

- **Working parents' support group**

Federal Legislation

- **Breastfeeding Promotion and Employers' Tax Incentive Act of 1999**
- **Employers' tax credit for 50% of expenses involved in providing lactation support**

Special Role

Hospitals & health departments:

- **Major employers with many young female employees**

Special Role

Hospitals & health departments:

- **Stake in supporting breastfeeding for health reasons**
- **Serve as role models and resources**

Case 1 – Breast surgery

- 32 y.o. primagravida
- History of cosmetic reduction mammoplasty
- Plans to breastfeed this infant
- ? Impact of surgery on ability to breastfeed
- ? Prenatal evaluation
- ? Postnatal management

Case 2 – Preterm infant

- 25 y.o. Para 2 mother, delivered at 28 weeks
- Breastfed first baby 2 years ago
- Assumes that prematurity and small size preclude breastfeeding this infant.
- ? Benefits of breastmilk for premature baby
- ? Key issues in supporting lactation

Case 3 – Candidiasis

- 26 y.o. Para 3 mother
- Severe breast pain 2 weeks postpartum – “searing, throbbing pain”
- History of recurrent vaginal yeast infections – none recently
- Exam: normal appearing, diffusely tender breasts
- Infant: white plaques inside mouth
- ? Likely diagnosis
- ? Appropriate management

Case 4 – Adolescent mother

- **15 y.o. primagravida at 34-week visit.**
- **Decided to breastfeed, encouraged by 19 y.o. sister successfully breastfeeding**
- **Returning to school in September**
- **? Strategies for promoting breastfeeding among adolescents**
- **? Physiologic factors influencing success**
- **? Special management considerations**

Thanks to

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Bureau of Women's Health, NYS Department of Health

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