Dietary and Herbal Supplement Use in Rural Communities

Implications for Child Health Outcomes

Paula Gardiner, MD MPH

Assistant Director of Integrative Medicine, Boston University
Lecture Roadmap

- Dietary Supplements (DS) - definitions, history, regulation, disclosure, sales
- Epidemiology of DS use in children: national, next rural
- Addressing the research gaps (models of types of studies)
- Promising DS
- Recommendations for future research (safety and efficacy)
DS USE IN CHILDREN HAS POTENTIAL PROMISES AND PITFALLS

LITTLE IS KNOWN ABOUT DS USE IN RURAL CHILDREN
Defining Dietary Supplement
Usage Data: A Historical Perspective

- 2000 B.C.  *Here, eat this root.*
- 1000 B.C.  *That root is heathen, say this prayer.*
- 1850 A.D.  *That prayer is superstition, drink this potion.*
- 1940 A.D.  *That potion is snake oil, swallow this pill.*
- 1985 A.D.  *That pill is ineffective, take this antibiotic.*
- 2000 A.D.  *That antibiotic is artificial. Here, eat this root.*
How are herbs and dietary supplements regulated in the United States?
Dietary Supplement Health and Education Act (DSHEA)

- Dietary supplements can be marketed without testing efficacy
- Safety need not be proved before marketing
- Require good manufacturing practices
- Structure/function product claims allowed
- Label claims do not require extensive evidence
- FDA approval not needed for marketing claims
DSHEA’s Definition of Dietary Supplements

- Product (other than tobacco) that contains one or more of the following dietary ingredients:
  - a vitamin, mineral, herb or other botanical, or amino acid
  - a dietary substance for use by man to supplement the diet by increasing the total daily intake, or a concentrate, metabolite, constituent, extract, or combinations of these ingredients
Complexity of Supplements

- Multiple combinations of ingredients
- Many different types of products
  - Teas, tinctures, capsules, shakes/drinks….
- Products moved beyond clinical conditions
- Traditional medicines or cultural uses
  - Indigenous systems of medicine and healing often prominent in developing countries
What parents navigate…
What about dietary supplements use in children today?
Where Do We Find Pediatric Dietary Supplements?

- Teas (Kitchen)
- Soft and sport drinks
- Children’s vitamins
- Infant formula
- Sports fitness products
- Weight loss/gain products
- Medicinal OTCs

- Personal care
  - hair care
  - bath preparations
  - skin care
- Tinctures
- Essential oils
Start with the Parents in Rural Settings

- Natural therapies, folk, and home remedies are a long-established component of the lives of rural populations.
- DS use is high in ADULTS.
- High in chronic health conditions and less availability of conventional health care services.

doi: 10.1111/j.1748-0361.2010.00348.x
Where is the data on dietary supplement use children in rural communities?
Prevalence Dietary Supplements
Dietary supplement use among infants, children, and adolescents in the U.S., 1999-2002 (NHANES)

- 32% used dietary supplements
- 38% non-Hispanic white; 22% Mexican American; 19% non-Hispanic black
- Most common – Multivitamins / minerals (18%).
- DS contain - 29% Ascorbic acid, 26% retinol, 26% vitamin D, 21% calcium, and iron (19%)

Prevalence and SE (error bars) of dietary supplement use among infants, children, adolescents, and adults in the past 30 days

- Infants (12%)
- 4 to 8 year-old children (49%)
- 14 to 18 years old (26%)

Significant Findings

- Supplement use was associated with:
  - Families with higher income
  - Smoke-free environment
  - Lower body mass index (BMI)
  - Less daily recreational screen time

What about herb use in children in the United States?
Echinacea 37.2 %; Fish oil 30.5 %; Combination Herbal 17.9 %; Flaxseed 16.7 %
Biologically Based Therapies (HERBS and special diets)

Correlated with:

- Being a child (OR 1.60 [1.03, 2.51]) or an adolescent (OR 2.15 [1.35, 3.44])
- Living in the West (OR 1.89 [1.24, 2.90])
- Having parents who are college educated (OR 3.55 [1.88, 6.69])
- Non-Hispanic blacks and Hispanics (OR 0.60 [0.37, 0.96] OR 0.62 [0.40, 0.95])
Notable Findings

- Delays in health care due to difficulties with access
  - OR 1.50 [1.07, 2.10]

- Medical conditions including:
  - insomnia (odds ratio 2.60 [1.76, 3.85])
  - fever (odds ratio 1.47, [1.08, 2.00])
  - reflux (odds ratio 1.72 [1.10, 2.69])
  - sinusitis (odds ratio 1.45 [1.02, 2.05])
What about the regional studies?
Survey of WIC participants in Kansas and Wisconsin

- (N=2,562)
- Caregivers in WIC clinic completed a survey about herb use.
- 38% caregivers and 35% children used herbs
- Of the caregivers who gave herbs to their children, 11% were from rural settings
- Herb use > Latino children (48.4%) and caregivers (43.4%)
- Aloe, chamomile, garlic, peppermint, lavender, cranberry, ginger, echinacea, St. Johns Wort, tea tree

Survey in Southern Arizona

- Families of 376 children who were receiving services in a regional facility that serves children with special health care needs

- 19% used herbs

North Carolina Behavioral Risk Factor Surveillance System

- 2001 population-based telephone survey adults (N = 2982)
- 20% medicinal herbs in the past year.
- 5% reported giving their children herbal medicines

What is associated with giving their child a herb?
- having taken medicinal herbs themselves
- adults without health coverage anytime in the previous 12 months

What about special populations of children?
Kids with Chronic Illness

- 505 chronically ill children and adolescents
  - Asthma, Cystic fibrosis
  - Diabetes
  - Cancer
  - Renal transplantations
  - Seizures
  - Rheumatological and neurobehavioral disorder

Ball SD, *J Am Diet Assoc.* Jan 2005
Kids with Chronic Illness: Results

- Mean age of 9.9 +/- 5.3 years
- 62% of the population used dietary supplements
- Only 20% of those using non-prescribed dietary supplements had discussed this use with the health care provider
What types of studies would be helpful to rural children and their families?
Models of dietary supplements studies

- To supplement or not to supplement?
  - Dietary patterns – connections to obesity
Contribution of dietary supplements to nutrient adequacy among children in Hawaii

- Cross-sectional study. Children aged 8 to 11 years (n=185)
- A 24-hour food recall and a DS record
- Prevalence of dietary nutrient adequacy from foods alone (33% to 100%)
- Increased to 59% to 100% nutrient contribution when DS was included.

Models of dietary supplements studies

- Diet patterns
- Pinpoint Specific vitamin and mineral deficiencies (vitamin D, calcium, iron)
Diet, dietary supplement, and antacid use

1-3 y had the highest prevalence of meeting the AI from dietary and total calcium intakes.

Females 14-18 y had the lowest prevalence of meeting the AI.

Models of dietary supplements studies

- Diet patterns and obesity
- Specific Vitamin and mineral deficiencies (vitamin D, calcium, iron)
- Safety of dietary supplements in children
  - Dietary supplement itself
  - Contamination or adulteration of the DS
  - Accidental ingestions
DS-related adverse events reported to the California Poison Control Centers

- 1183 telephone calls were retrieved
- DS exposure occurred in 438 children (53%).
- DS-related AEs were reported in 134 children (28%).
- 84% intentional ingestion had an AE
- 16% accidental ingestion were reported an AE

Promising Supplements

- Vitamin D and Calcium
- Omega 3 fatty acids
  - Fish oil, flax seeds
- Probiotics
- Cranberry
- Elderberry
- Ginger
- Chamomile
- Melatonin
Evidence for Probiotics

- Lactobacillus GG reduced incidence and duration of diarrhea in children treated with antibiotics

- Useful adjunct to rehydration therapy in treating acute infectious diarrhea in children
  - Allen. S. Cochrane Review, 2005
Evidence for Cranberry

- Jepson et al.- Cochrane review of ten clinical trials on the prevention of UTIs (n = 1049, five cross-over, five parallel group).
- Cran, cran-lingonberry juice versus placebo, juice or water were evaluated in 7 studies, and cran tablets versus placebo in four studies (1 study evaluated both juice and tablets).
- The authors found that products significantly reduced the incidence of UTIs at 12 months (RR 0.65, 95% CI 0.46 to 0.90) compared with placebo/control.
  - Jepson et al. - Cochrane review, 2009
Final Thoughts on Research Agenda

- Characteristics and diversity of DS use in children and families in the rural setting
- MORE Safety studies and Efficacy
- Design research tools to study DS/herbs in a culturally sensitive way understanding regional differences
- Mixed method designs
Conclusion

- DS use in children is common
- There is little data on DS use in children living in rural settings
  - Who, What, Where, Why
  - Connections to barriers to health care?
  - Safety?
  - Effectiveness?