Early Childhood Caries Research in Manitoba

Robert Schroth, DMD, MSc
University of Manitoba
April 19, 2007

Early Childhood Caries (ECC)

• Tooth decay is most common chronic disease of early childhood (5X more than asthma) US Dept Health & Human Services 2000

• Increased caries experience throughout childhood Peretz S et al Pediatr

• Decay at early ages can cause problems such as:
  - Difficulty eating, speaking and sleeping
  - Reduced oral health quality of life
  - Pain & infection
  - Affected growth

Filstrup SL et al Pediatr Dent 2003,
Low WW et al Pediatr Dent 1999,
Acs G et al Pediatr Dent 1992
How do we define ECC?

Early Childhood = Infant (0-23 months) + Preschool child (24 –71 months)

Early childhood caries (ECC) is defined as ≥ 1 primary tooth affected by decay in infant and preschool children

<table>
<thead>
<tr>
<th>Nursing caries</th>
<th>Baby-bottle tooth decay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing bottle syndrome</td>
<td>Rampant caries</td>
</tr>
<tr>
<td>Bottle mouth syndrome</td>
<td>Night bottle mouth</td>
</tr>
<tr>
<td>Sugared tea caries</td>
<td>Milk bottle caries</td>
</tr>
</tbody>
</table>

Why is ECC such a problem?

- General anesthesia often necessary
- Expensive to treat (i.e. travel, facility fees, dental fees)
- Increased risk of cavities throughout childhood
- Prevalent in Manitoba especially among Aboriginal children – large waiting list for tx
How many young children have dental surgery annually?

Source: Winnipeg Regional Health Authority, Oral Health Program, November 2006


Risk Factors for ECC

- Age of child
- Socioeconomic status
- No water fluoridation
- Sugar intake/snacking habits
- Oral hygiene & late initiation of brushing
- Enamel hypoplasia
- Streptococcus mutans
- Pregnancy complications
- Not breastfeeding
- Bottle feeding habits
- Bedtime bottle
- Prolonged non-nutritive breastfeeding
- Delayed first dental visit & limited access to care
- Parental knowledge & attitudes
- Child temperament
- Ethnicity
- Parental education level

Plus Many Others
What are we doing in Manitoba?

• ECC prevalence studies in Manitoba
  (Aboriginal, First Nations, Hutterite Colonies, low-income communities)

• Do prenatal vitamin D deficiencies influence infant/preschool oral health?

• Healthy Smile Happy Child Project
  (Innovative early childhood oral health promotion project based on community development principles)
Determinants of ECC in Manitoba

- Sugar added to bottle
- Bottle-feeding
- Breastfeeding protective against caries
- Plaque/debris levels
- Age of child
- Socioeconomic status (fridge in house)
- Low maternal education
- No difference in prevalence (on-Reserve First Nations vs. disadvantaged urban community)

The Pregnancy Connection

- Primary teeth begin to form as early as 6 weeks & start to calcify during the 2nd trimester

- Problems during pregnancy (malnutrition, premature birth, maternal diabetes, prenatal infections) may interfere with dental enamel formation predisposing enamel hypoplasia (EH) and DDEs

- Enamel hypoplasia is a risk factor for ECC
Vitamin D and Infant Oral Health

Recruitment
• Serum Sample
• Questionnaire

1st Primary Tooth Erupts

Follow-up
• Infant Dental Exam
• Questionnaire

Follow-up Study

2nd Trimester  Birth  6 Months  12 Months

Time

23-47 Months

• Began in 2000 in response to wait list for dental Sx

• Clinicians, researchers/academics, & policy-makers (Multi-disciplinary, multi-agency approach using Community Development)

• 3 Pillars:
  – Community Development
  – Oral Health Promotion/ECC Prevention
  – Evaluation/Research

• 4 pilot communities
  – 2 First Nations
  – 2 urban centres
• To gain community acceptance of the importance of early childhood oral health

• To build on existing programs which target young children

• To increase parental knowledge of ECC prevention

• To increase the knowledge of existing service providers (i.e. public health) of the importance of prevention of ECC

• To encourage existing service providers to incorporate ECC prevention activities into their practice

---

**Baseline Study**

- 4 pilot sites selected
  - (2 northern and 2 southern)
- Cross-sectional design
- Children < 72 months of age & caregiver
- Dental examination following established indices
- Interviewed questionnaire with caregiver
- $p \leq 0.05$ denoted significance

Knowledge Transfer of Research Findings

Profiles were compiled for each community

Key risk factors for ECC in their community were shared with them

Assisted with community-based oral health promotion strategies

Community Developed Resources

Prevent Early Childhood Tooth Decay
Action Plan Workbook and Toolkit

Think About Your Baby’s Teeth
prevent early childhood tooth decay
over drinks are not meant to stop oral and bottle

http://www.wrha.mb.ca/caring/preventill/oral.php
Community Facilitators

- 1 Project Coordinator

- 5 Community Facilitators:
  - Burntwood & Churchill
  - NOR-MAN & Parkland
  - Central, Assiniboine, & Brandon
  - North Eastman & South Eastman
  - Winnipeg & Interlake

- Provide local **capacity building workshops**

- **Enable community action** and activities (building capacity) within existing programs which support the incorporation of ECTD knowledge

- **Identify local opportunities** to deliver workshops

- **Build relationships** with local programs

- **Follow up with workshop participants** to encourage and support use of the materials provided

- Participate in follow up contacts will all engaged groups and services
WHO Criteria for Oral Health Strategies

**Why are we doing this?**

- Improve early childhood oral health
- Reduce the number of children with ECC needing dental surgery
- Identify potential preventive interventions
Aboriginal Early Childhood Oral Health Research Needs:

- Quality of Life
  - Studies on nutrition & preschool oral health/ECC
  - Documenting pain among children with severe-ECC

- Qualitative Research
  - How do Aboriginal communities view ECC?

- Participatory Research
  - How to engage communities in research and build research capacity? Letting the community develop research questions

- National Networks

- Translating Research Evidence into Policy

Acknowledgements

- Manitoba Institute of Child Health
- Canadian Child Health Clinician Scientist Program (CCHCSP)
- Manitoba Medical Service Foundation
- Dentistry Canada Fund
- Manitoba Health
- Faculty of Dentistry, University of Manitoba
- Dairy Farmers of Canada
- Canadian Institutes of Health Research
- Winnipeg Foundation
- Foundation of the Pierre Fauchard Academy
- University of Manitoba
- Health Canada, First Nations and Inuit Health Branch
- Winnipeg Regional Health Authority
- Manitoba Dental Association
- Dr. Michael Moffatt, Jeanette Edwards, Dr. Doug Brothwell, Dr. Bernadette Mellon, Dr. Chris Lavelle, Plus Many Others