Dental Utilization for Medicaid-Enrolled Children with Cystic Fibrosis

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Elise Sarvas, DDS, MSDc, MPHc

This study was supported by the US Department of Health and Human Services, Health Resources and Services Administration’s Maternal and Child Health Bureau (Title V, Social Security Act), grant #T76MC00011.
Testing a Multifactorial Caries Model for Patients with Cystic Fibrosis at Seattle Children’s Hospital


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Overview of CF

- Most common life-limiting genetic disease in Whites
- Worldwide: 70,000 individuals
- United States: 30,000 individuals
- Prevalence overall:
  - European Union (27 countries): 0.737/10,000
  - United States: 0.797/10,000
- Prevalence by race:

<table>
<thead>
<tr>
<th></th>
<th>Whites</th>
<th>Hispanics</th>
<th>Blacks</th>
<th>Asians</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1:3,200</td>
<td>1:7,000</td>
<td>1:15,000</td>
<td>1:31,000</td>
</tr>
</tbody>
</table>

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Clinical effects on organ systems: Lungs

- Lung tissue damage
- Irreversible bronchiectasis and progressive respiratory failure

Haemophilus influenza
Pseudomonas aeruginosa
Burkholderia cepacia
Staphylococcus aureus

Candida
Aspergillus

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Life expectancy

1939: Clinical pathology described

1950s: Mean survival 6 months

1960s: Mean survival to elementary school

mid-1980s: Lung transplants begin

mid-1990s: Inhaled Tobramycin

1980s: Mean survival to high school

1989: ctfr-gene discovered

2003: Mean survival 33.4 years

2013: Mean survival 40.7 years

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Risk factors for dental caries
Caries risk factors

Enamel defects
- weaken tooth structure
- haven for microbes

Medicines
- xerostomic inducing
- dosed in sugary suspensions

GERD
- acid erosion
- poor absorption of foods

Eating frequency
- keeps salivary pH below 5.5
- fuels bacteria

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Caries prevalence in literature

- Lower than non-CF, healthy matched controls
  - Primosch 1980
  - Aps & Martens 2004
  - Ferrazzano et al 2009

- Lower than non-CF, healthy siblings
  - Jagels & Sweeney 1976
  - Aps & Martens 2004

- Lower than individuals with chronic respiratory conditions
  - Narang et al 2003

- Lower than cohort of children with handicaps (undefined)
  - Swallow et al 1967

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Health care use

- Children with CF meet with their medical management team every 3 months routinely
  - Pulmonologist, nutritionist, physical therapist, respiratory therapist, nurse, social worker and others
- Maybe they use more dental care…

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STUDY AIMS

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Study aim 1

- To compare dental use for Medicaid-enrolled children with and without CF

- Given their chronic medical condition that requires the increased use of medical care beyond what is considered normal, this may encourage families of children with CF to use dental care

- We will test the hypothesis that children with CF use dental care at a higher rate than children without CF

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Study aim 2

- To compare if the types of dental care individuals with CF use are different from individuals without CF

- We will test the hypothesis that children with CF use more diagnostic and preventive care and less restorative care than children without CF

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METHODS
Data

• Administrative enrollment and medical and dental claims obtained from Iowa Department of Human Services

• Ages 3 – 17

• Enrolled in Medicaid at least 11 months
Study population: Medicaid enrollment

- Children 3 – 17 years in Iowa 2012 July estimate: 607,992
- Children ages 3 – 17 years enrolled in Medicaid: 234,556
  - Iowa requirement: 0 – 133% of the FPL
- Children 3 – 17 years with at least 11 months enrollment in Medicaid: 156,268

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Cystic fibrosis in Iowa

- Number of individuals with CF in Iowa according to CFF in 2012: 380
- Estimated number of children with CF in Iowa as half of individuals with CF are under 18 years old: 190
- Estimate as 53% of children with CF have state or Medicaid insurance. This is not mutually exclusive of other types of insurance: 101
- Individuals with CF identified in our study between 3 – 17 years: 99
- Individuals with CF in our study with at least 11 months enrollment in Medicaid: 85

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RESULTS
Bivariate statistics: Dental care use
Dental care use

<table>
<thead>
<tr>
<th>Any dental care</th>
<th>With CF</th>
<th>Without CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of children</td>
<td>43 (50.6%)</td>
<td>104,409 (69.7%)</td>
</tr>
</tbody>
</table>

$p < 0.001$

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### Types of dental care (number of children)

<table>
<thead>
<tr>
<th>Type of Dental Care</th>
<th>With CF</th>
<th>Without CF</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>42 (49.4%)</td>
<td>104,409 (66.9%)</td>
<td>0.177</td>
</tr>
<tr>
<td>Preventive</td>
<td>41 (48.2%)</td>
<td>102,718 (65.8%)</td>
<td>0.201</td>
</tr>
<tr>
<td>Routine restorative</td>
<td>5 (5.9%)</td>
<td>30,602 (19.6%)</td>
<td>0.100</td>
</tr>
<tr>
<td>Complex restorative</td>
<td>6 (7.1%)</td>
<td>18,714 (12.0%)</td>
<td>0.935</td>
</tr>
</tbody>
</table>

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Multiple variable regression models: Dental care use
### Dental care use

**Any dental care (adjusted for race and age)**

<table>
<thead>
<tr>
<th>IRR</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.819</td>
<td>0.80 – 0.84</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

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<tr>
<th>Type</th>
<th>IRR</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnostic</td>
<td>1.21</td>
<td>0.89 – 1.64</td>
<td>0.225</td>
</tr>
<tr>
<td>Preventive</td>
<td>1.19</td>
<td>0.88 – 1.63</td>
<td>0.264</td>
</tr>
<tr>
<td>Routine restorative</td>
<td>0.50</td>
<td>0.19 – 1.34</td>
<td>0.165</td>
</tr>
<tr>
<td>Complex restorative</td>
<td>0.82</td>
<td>0.31 – 2.16</td>
<td>0.684</td>
</tr>
</tbody>
</table>

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DISCUSSION
Study aim 1: Overall dental care use

- Only about half of Medicaid-enrolled children with CF used dental care in 2012
  - Significantly less use than children without CF
  - Relationship holds true even when adjusted for race and age

Other health care obligations

Resource constraints

Few dental referrals from CF team

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Study aim 2: Diagnostic and preventive care

- Children with CF use more diagnostic and preventive services than children without CF, but this difference is not significant
  - Relationship holds true when adjusted for race and age

Possible biologic etiology for low caries prevalence

Low dental use for everyone

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Study aim 2: Restorative care

• Children with CF use less restorative care than children without CF, but this difference is not significant.
  • Relationship holds true when adjusted for race and age
  • Holds true for both routine and complex restorative care

Children with CF have lower caries prevalence

Result of children with CF using less dental care

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Study strengths

- Adds previously missing analysis of dental care use to the small but growing body of knowledge about the oral health of individuals with CF
  - Previous studies focus on oral health characteristics, caries prevalence

- Our study compares similar groups of children who may be missed from traditional studies of dental care
  - Previous studies have inherent bias because they rely on families and children who present to academic medical centers.
Study limitations

• Study only encompasses one year and only one state
  • Future studies should look at multiple years and/or states

• Dental provider type assessed only for children with CF
  • Unable to currently do a statistical analysis

• Dental utilization rates do not give an accurate picture of existing dental needs
  • Just because children with CF did not use dental care does not mean they do not have dental needs.
Clinical recommendations

**CF team**
- be more cognizant about oral health
- increase dental referrals as needed

**General dentists**
- increase pre-doctoral education for treating patients with SHCNs
- recognize caries risk

**Individuals with CF**
- recognize increased caries risk factors
- understand oral health implications on overall health
Future directions

- Further research into what types of dental providers individuals with CF use
- Look at dental use trends over multiple years and in multiple states
- Survey families on barriers to dental care
- Conduct clinical trials to look at risk factors for dental caries in individuals with CF.

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CONCLUSION

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Conclusion

• Children with CF face increased risk factors for developing dental caries, but the literature reports they paradoxically have an overall lower caries prevalence.

• Increased dental care use is not a probable etiology for this lower caries prevalence as children with CF use less than children without CF.

• Future population and clinical studies are needed to determine why children with CF have lower caries prevalence.

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REFERENCES
Selected references


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QUESTIONS?