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The effect of losing federal coverage through the Affordable Care Act on ear tube placements at an urban children's hospital

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ABSTRACT

Purpose: 15–31% of the population in a large Mid-western city is between 100 and 400% of the Federal Poverty Level, thus qualifying for health care coverage under the Affordable Care Act (ACA). Coverage for their children would potentially be available under Children's Health Insurance Program (CHIP) or Medicaid programs. Loss of funding for these programs could be devastating for this community.

Methods: We retrospectively reviewed 1162 charts of pediatric patients with tympanostomy tube (TT) placement pre-ACA from November 2012 to December 2013 and 1606 charts post-ACA from January 2014 to July 2015. We filtered demographics by health insurance (Medicaid/CHIP/Other), residential zip codes, identified race/ethnicity within those zip codes as well as gender and age of patients getting TT during these periods.

Results: Bivariate analysis of these demographics between the two periods showed statistical significance ($p = 0.0098$) between White Hispanic/Latino children receiving ear tubes (pre-ACA = 3.8%, post-ACA = 6.4%). However, there was no statistical significance for insurance enrollment (Medicaid or non-Medicaid) and other races (White-not Hispanic/Latino (nHL), African American, Other/Unknown/Refused) with respect to TT placement. Using pre-ACA period and White nHL females as arbitrary reference, a multivariate logistic regression showed that patients requiring TT surgery were equally likely to be covered on Medicaid either before or after ACA.

Conclusion: We demonstrated that the pre and post ACA Medicaid coverage for TT surgery did not change. Underserved children did not obtain other forms of insurance during this time. This demonstrates a potentially catastrophic loss of coverage for children should Medicaid/CHIP benefits be lost to sole coverage under the ACA.

1. Introduction

Otitis media (OM) is one of the most common diagnosis affecting preschool age children in the United States. It represents the most common indication for antibiotic usage and outpatient visits in pediatric patients. It is associated with significant increases in the direct costs incurred by the consumer and the health care system with an estimation of $2.88 billion annual direct health-care cost in the United States [1]. After medical management, there are several surgical interventions that can be employed in the management of OM including adenoidectomy and myringocentesis. However, the most common intervention is the placement of tympanostomy tubes (TT) with approximately one million TT placed in the US annually.

The city of Milwaukee in the state of Wisconsin is considered one of the most racially segregated cities in the United States where 38.9% of children live below the federal poverty level. The Children's Hospital of Wisconsin (CHW) provides otolaryngological care for a large proportion of children insured under the Children's Health Insurance Plan (CHIP) or Medicaid programs. Factors such as low socioeconomic status or lack of insurance coverage can affect the rate of TT placement in children from disadvantaged backgrounds. One study by Nieman et al. [2] showed that ear tube placement does tend to be less frequently performed for children of low socioeconomic status.

Within the United States, children of disadvantaged backgrounds that is primarily defined by their family's income level have been granted health insurance coverage through federal programs such as CHIP and Medicaid. CHIP was enacted in 1997 to extend health coverage to children in poor families with modest incomes too high to qualify for Medicaid. It covers nearly 9 million children nationwide in low-income families from 138 to 405% of the federal poverty level [4].

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The Affordable Care Act (ACA) was enacted in 2010 and offered many of those same families federal subsidies through the health insurance exchanges, calling into question whether the CHIP program should be continued long term. The ACA primarily aims to insure more adults, including parents. In the process, a substantial number of uninsured children were expected to get coverage through their parents [3].

In families with incomes below 138% of federal poverty level, young children from infancy to 6 years old are covered under Medicaid. The ACA required states to shift children ages 6–19 in families with incomes between 0 and 138% of poverty level out of CHIP and into Medicaid in 2014 [4]. This transfer was estimated to affect more than 1.5 million low-income children. The new US presidency in January 2017 brought several discussions and momentum to repeal the ACA that ended with the Senate not voting in favor of the repeal on September 26, 2017. Meanwhile, the CHIP funding lapsed on September 30, 2017. Until Congress renewed CHIP, states were cut off from additional federal funding that helps lower and middle-income families. Most states were estimated to run out of funding in early 2018.

An estimate of Milwaukee's population census from 2010 to 2016 showed no significant population change (594,047 vs 595,047) wherein persons under 5 years make 8.2% of the population. With the transition of families to mandated health coverage either through Medicaid, or by gaining new health insurance through the marketplace, we expected to see an increase in the number of TT placements for LSS children. We compared pre and post numbers of TT procedures performed at CHW against health insurance demographics for dates that are prior and after the enactment of ACA [8]

2. Methods

The Clinical Outcomes Registry (COR) is a secure, Health Insurance Portability and Accountability Act (HIPAA) compliant web-based system for prospective data collection. In collaboration with the Clinical Outcomes Team at CHW Division of Pediatric Otolaryngology at the Medical College of Wisconsin, we developed a specific module designed to track all patients referred to the Pediatric Otolaryngology Clinic at CHW with a diagnosis of OM [1]. Key fields that were entered to query patient charts include demographic and insurance information, the identified race/gender of patients, chief complaint, co-morbidities and diagnosis. The Institutional Review Board at the Children's Hospital of Wisconsin approved this study.

We retrospectively reviewed charts of pediatric patients from the pre-ACA (November 2012–December 2013) and the post-ACA (January 2014–July 2015) period who received surgery at CHW for TT placement. The inclusion criteria included children from ages 6 months to 5 years. Their demographic information was further categorized by insurance status (Medicaid/CHIP or BadgerCare/Other), residential zip codes, identified race, ethnicity and gender of patients. Patients with craniofacial and/or genetic disorders, those with complications from otitis media requiring more complex management and those with a history of failed new born hearing screen were excluded.

Statistical Analysis: Statistical analysis was performed using the SAS version 9.4 software package (©2002–2012, SAS Institute Inc., Cary, NC). Pearson's chi-squared tests were preformed to show associations between pre/post ACA and the various categorical demographics. Student t-tests were used to determine any difference in age of patients between the pre and post ACA periods. Multiple logistic regression was performed to model the probability of a TT placement surgery patient being covered by either Medicaid or CHIP/BadgerCare. P-values were considered significant if they exceeded a significance level of $\alpha = 0.05$.

3. Results

Our initial data looked at the patient demographics by insurance status as being Medicaid or non-Medicaid. On bivariate analysis of the various demographics between the two periods, we found an increase in the percentage of Hispanic/Latino children receiving ear tubes in the pre and post ACA periods. However, there was no association for the categories of insurance enrollment and other races with respect to TT placement that showed statistical significance. Using pre-ACA period and White non-Hispanic/Latino females as an arbitrary reference, a multivariate logistic regression showed that patients requiring TT surgery were equally likely to be covered on Medicaid either before or after ACA.

We re-evaluated our data by changing the insurance status to CHIP and/or BadgerCare (a health care coverage system for low income residents of Wisconsin). Expecting the overlap of coverage under Medicaid and BadgerCare/CHIP, the results are very similar to the previous analysis except for noting that there was no statistical significance in the White Hispanic/Latino group in this category for receiving TT surgery (see Tables 1–4).

Table 1
Bivariate Analyses between Pre-/Post-ACA and various demographics.

	Pre-ACA period (n = 1162)	Post-ACA period (n = 1606)	p-value
Medicaid Coverage, n (%)			
Yes	457 (39.3%)	619 (38.6%)	0.6755
No	705 (60.7%)	987 (61.5%)	
Race/Ethnicity, n (%)			
White, not Hispanic or Latino	786 (67.6%)	1095 (68.2%)	0.0098
White, Hispanic or Latino	44 (3.8%)	103 (6.4%)	
African American	188 (16.2%)	227 (14.1%)	
Other/Unknown/ Refused	144 (12.4%)	181 (11.3%)	
Sex, n (%)			
Male	677 (58.3%)	959 (59.7%)	0.4432
Female	485 (41.7%)	647 (40.3%)	
Age at Procedure in years, mean (SD)	2.1 (1.37)	1.9 (1.20)	< 0.0001

SD = Standard Deviation, Pre-ACA = 11/5/12 thru 12/31/13, Post-ACA = 1/1/14 thru 7/31/15: Medicaid is defined as have either just Medicaid insurance or Medicaid combined with any other form of coverage.

4. Discussion

CHIP covers about nine million children whose parents are above the earning bracket to qualify for Medicaid, but not enough to afford private health insurance-typically no more than $62,000 for a family of four. The twenty-year old program that cost about $15.6 billion in fiscal 2016 was funded almost entirely by the federal government [6].

Funding for CHIP ended on September 30, 2017 and Congress at the time failed to reauthorize a long-term appropriation for it. States have

Table 2
Multivariate Logistic Regression, Modeling the Probability of a Tube Placement Surgery Patient being Covered by Medicaid.

	Odds Ratio	95% Confidence Interval	p-value
Race/Ethnicity			
White	Reference	–	–
White, Hispanic or Latino	16.2	(10.59, 24.76)	< 0.0001
African American	34.1	(24.46, 47.47)	< 0.0001
Other/Unknown/Refused	7.0	(5.45, 9.08)	< 0.0001
Sex			
Female	Reference	–	–
Male	1.0	(0.82, 1.20)	0.8968
Age at Procedure	1.2	(1.13, 1.30)	< 0.0001
ACA Period			
Pre-ACA	Reference	–	–
Post-ACA	1.0	(0.84, 1.23)	0.8490

N = 2768.