Characteristics of Dental-Related Hospital Admissions in Michigan, 2009-2010

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BACKGROUND

- Untreated dental disease can significantly impact systemic health and may result in costly hospitalizations.
- Preventable dental conditions impose a costly and unnecessary strain on national and state budgets.
- The burden of dental-related hospital admissions in Michigan has not been reported previously.

OBJECTIVES

- Describe the prevalence and characteristics of non-traumatic dental-related hospitalizations and resulting charges in Michigan from 2009-2010
- Compare characteristics of preventable versus unpreventable dental admissions

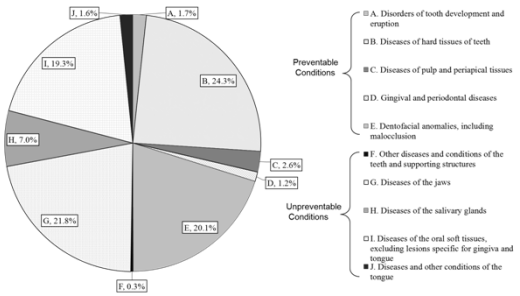
METHODS

- Hospital discharge data from the Michigan Inpatient Database were assessed to determine the prevalence, characteristics, and charges resulting from preventable non-traumatic dental-related hospitalizations in Michigan over a 2 year period.
- Primary diagnosis ICD-9-CM codes (520.0-529.9) were used to identify dental hospitalizations and were stratified into preventable (521.0-523.9, 525.0-525.9, 528.0-528.9) and unpreventable admissions.
- Multivariable logistic regression was used to determine independent factors associated with preventable versus unpreventable dental admissions.

RESULTS

- On average, there were 1978 non-traumatic dental-related hospitalizations annually during the two year period accounting for 0.15% of all hospital admissions in Michigan.
- Half (56.4%) of hospitalizations occurred to people under 45 years old, 53.3% to women, and 73.8% to white people.
- Forty-five percent of hospitalizations were charged to government insurance while 8.8% were expected to pay out-of-pocket.
- Half (49.9%) of all annual dental admissions were preventable. (Figure 1)
- Diseases of the hard tissues of teeth (48.7%) was the most frequent preventable hospitalization ICD-9 category followed by dentofacial anomalies, including malocclusion (40.3%).
- Annual charges for dental-related hospitalizations were over $25 million with over $9 million in preventable hospitalizations.

Figure 1. Distribution of Primary Diagnosis ICD-9 Codes Among All Dental-Related Hospitalizations, 2009-2010



RESULTS

Table 1. Characteristics of Dental Admissions by Preventable vs. Unpreventable Conditions

		Preventable		Unpreventable		χ^2, p-value
		%	N	%	N	
Age Group	0-17	48.9%	363	51.1%	379	43.0, < 0.0001
	18-44	50.9%	756	49.1%	730	
	45-64	54.9%	542	45.1%	446	
	65-84	46.3%	261	53.7%	303	
	≥85	29.3%	51	70.7%	123	
Sex	Male	57.0%	1053	43.0%	795	69.8, < 0.0001
	Female	43.7%	921	56.3%	1188	
Race	White	45.7%	1325	54.3%	1573	83.2, <0.0001
	Black	62.7%	579	37.3%	345	
	Other	58.1%	61	41.9%	44	
Insurance Type	Private Insurance	58.1%	1026	41.9%	740	330.0, <0.0001
	Government	35.2%	631	64.7%	1159	
	Self-pay	80.5%	277	19.5%	67	
Admitted From	Referral*	35.4%	727	64.6%	1327	342.3, <0.0001
	Transfer**	48.5%	32	51.5%	34	
	Emergency Room	66.6%	1024	33.4%	514	
Type of Admission	Emergency	62.2%	1330	34.8%	710	841.9, <0.0001
	Urgent	62.7%	462	37.3%	275	
	Elective	13.3%	149	86.7%	974	

* Includes physician, clinic/outpatient, and HMO referral
**Transfer from hospital, skilled nursing facility, another health care facility

- Hospitalizations to patients who were younger, male, and non-white were more often for preventable compared to unpreventable dental conditions. (Table 1)
- Hospitalizations to patients with private or self-pay insurance types were admitted to the hospital with a preventable dental hospitalization more often.
- A higher percentage of hospitalizations admitted from the emergency room were due to a preventable dental condition.
- Admissions of an emergency or urgent type had a preventable dental-related hospitalization more often than those with an elective admission.

Table 2. Preventable vs. Unpreventable Dental Hospital Admissions, Crude and Adjusted Odds, Michigan, 2009-2010

		Crude		Adjusted	
		OR	95% CI	OR	95% CI
Age Group	0-17	Ref	---	---	---
	18-44	1.08	(0.91, 1.29)	0.71	(0.56, 0.91)
	45-64	1.27	(1.05, 1.54)	0.71	(0.56, 0.92)
	65-84	0.90	(0.72, 1.12)	0.32	(0.24, 0.43)
	≥85	0.43	(0.30, 0.62)	0.13	(0.08, 0.20)
Sex	Male	Ref	---	---	---
	Female	0.58	(0.52, 0.66)	0.64	(0.55, 0.76)
Race	White	Ref	---	---	---
	Black	1.99	(1.71, 2.32)	1.12	(0.92, 1.35)
	Other	1.65	(1.11, 2.44)	1.35	(0.83, 2.22)
Insurance Type	Government	Ref	---	---	---
	Private	0.39	(0.34, 0.45)	0.53	(0.43, 0.64)
	Self-pay	2.98	(2.25, 3.96)	1.67	(1.20, 2.34)
Admitted From	Referral	Ref	---	---	---
	Transfer	1.72	(1.05, 2.81)	1.26	(0.72, 2.21)
	Emergency Room	3.36	(3.16, 4.18)	1.15	(0.95, 1.40)
Type of Admission	Emergency	Ref	---	---	---
	Urgent	0.9	(0.75, 1.07)	1.01	(0.81, 1.25)
	Elective	0.08	(0.07, 0.10)	0.09	(0.07, 0.12)

- Age Group, Gender, Race, Insurance Type, Place Admitted From, and Type of Admission were included in a multivariable logistic regression model (Table 2)
- Crude odds ratios reflect the results shown in Table 1
- Adjusted odds ratios provide the following results:
  - *Hospitalizations in every age category were significantly less likely for a preventable dental condition compared to hospitalizations in people younger than 18 years.*
  - *Women were significantly less likely to be admitted for a preventable dental condition than men.*
  - *Hospitalizations charged to private insurance were less likely to be admitted for a preventable condition, while those expected to pay out-of-pocket were significantly more likely to be preventable.*
  - *Elective admissions were significantly less likely to be of a preventable nature compared emergency admissions*

CONCLUSIONS

- There were approximately 1000 annual preventable dental-related hospitalizations in Michigan from 2009-2010 .
- Over $9 million in charges due to preventable dental admissions could be avoided by regular dental care and treatment.
- Efforts should focus on increased access to preventive dental care for groups with greater odds of preventable dental admissions such as expanding the Michigan School-Based Sealant Program to more schools with a high proportion of children at greater odds, increasing Medicaid reimbursement rates for dental services, and expanding the capacity of the healthcare workforce to provide dental services.
- Future studies should focus on regional differences in the burden of preventable dental admissions in Michigan.