Doctor, my tooth hurts: the costs of incomplete dental care in the emergency room

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Abstract

Objectives: This study aims to examine the charges and frequency of return visits for treating dental health problems in hospital emergency rooms (ERs) in order to provide a basis for policy discussion concerning cost-effective and appropriate treatment for those without access to private dental services.
Methods: Records were abstracted from hospital administrative data systems for dental-related ER visits from five major hospital systems in the Minneapolis-St. Paul metropolitan area during a 1-year period. Data on the number of visits and charges were analyzed by age and type of payor (public or private). Similar data were obtained from records for a commercially insured population from a single large employer.
Results: There were over 10,000 visits to ERs for dental-related problems with total charges reaching nearly $5 million in 1 year, mainly charged to public programs and reimbursed at about 50 percent. The frequency of repeat visits suggests that while acute pain and infection were treated by the ER physicians, the underlying dental problem often was not resolved. In contrast, a population with commercial dental insurance rarely used hospital ERs for dental problems.
Conclusions: Access to preventive and restorative dental care is a critical public health problem in the United States, particularly for those without insurance and those covered by public programs. Public health policy initiatives such as the use of dental therapists should be expanded to improve access and to provide alternatives that offer more complete and less costly care for oral health problems than do hospital ERs.

Introduction

Untreated dental disease continues to be a significant public health problem in the United States (1-3). Preventive dental care can improve oral health, yet many adults and children do not receive regular dental care (4,5). Financial barriers are one major impediment to receiving dental services (6). One of the most important aspects of the access problem is the lack of dental insurance coverage. Roughly two-thirds of adults and one in five children lacked dental insurance in Minnesota in 2001 (7). The Agency for Healthcare Research and Quality estimates that in 2004, 35 percent of the population, or more than 100 million people, had no dental coverage (5). While expansions of the Children's Health Insurance Program (CHIP) have increased the availability of dental benefits for low-income children, as many as one in five children and young adults under age 21 had neither public nor private dental insurance in 2004 (5).

A second critical issue in determining access to dental care is finding a dentist, particularly for those on Medicaid/CHIP or without dental insurance. Fewer than half of all dentists participate in public dental insurance programs, and even those who do may restrict the number served (8). Several states recently attempted to increase participation by dentists by increasing payment rates, but with mixed success (8).

Without access to regular dental care and dental insurance, both adults and children often do not receive either preventive or restorative dental care. They postpone treatment until

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it becomes an emergency, or seek care for immediate dental problems in a hospital emergency room (ER). It is well known that treatment in a hospital ER is expensive, and, in addition, the type of care provided in an ER is incomplete and may not solve the underlying cause of the dental problem (9). ER physicians treat pain and infection but do not perform restorative procedures or do extractions; rather, they advise the patient to "see your dentist in the morning." Many dental emergency visits result from untreated and often recurring dental problems; others are true emergencies. Regardless, most emergency visits require follow-up care with a dentist. Potential for that follow-up with appropriately trained staff is nearly nonexistent for those without a regular dentist, commercial dental insurance, or the ability to pay out-of-pocket.

Several studies have attempted to estimate the effects on individuals, hospitals, and society because of the lack of access to dental care. The Surgeon General's 2000 report described the costs of poor oral health in terms of impacts on quality of life and overall well-being (3). Another study estimated 164 million hours of lost work time and 51 million hours of lost school time as a result of dental problems in the United States in 1989 (10).

Several recent studies have examined the use of hospital ERs for dental-related care. One study estimated that in 1997, there were 62,000 avoidable ER dental visits by North Carolina Medicaid patients which incurred total reimbursements of $1,686,565 (11). Another study found that Medicaid patients in Maryland who lost dental care coverage after a policy change were more likely to seek care for acute dental problems in hospital ERs (12). In California, a recent study found that visits to hospital ERs for preventable dental conditions had increased 12 percent between 2005 and 2007 (13). Of the more than 80,000 visits in 2007, about two-thirds were covered by public programs (Medi-Cal) or were uninsured (13). Finally, evidence from a national survey indicates that over 700,000 dental-related visits to hospital ERs occurred annually between 1997 and 2000 and the authors suggest that lack of private insurance is a major factor associated with ER visits for dental problems (14).

The primary objective of this study is to assess the charges for dental-related ER visits and frequency of return visits at the major hospitals in one metropolitan area. Charges represent the cost of resources used by hospitals to provide these services, plus profit, with reimbursements typically being considerably less than charges. Return visits may indicate that the ER treatment was ineffective in that, while acute pain and infection were treated, the underlying dental condition that led to pain and infection was not addressed because ER physicians do not do extractions or restorative dental procedures. By determining the frequency of hospital ER visits for dental emergencies and the charges for that care, we provide a basis for policy discussion concerning cost-effective and appropriate treatment, such as urgent-care dental facilities or utilization of dental therapists in community health centers (CHC), for those without access to private dental services.

Methods

The data for this study were abstracted from the records of five hospital systems (a total of seven hospitals) in the Minneapolis-St. Paul metropolitan area in Minnesota. The hospitals provided information on all ER visits during a 1-year period (July 1, 2004 through June 30, 2005) based on a specified set of dental-related ICD-9 diagnostic codes. (The complete list of codes is available from the authors upon request.) Data provided include date of visit, age of patient, ICD-9 diagnostic code(s), source of payment (e.g., commercial insurance, public programs, or self-pay), facility charges (including laboratory and radiographic charges) and physician charges, and frequency of repeat visits to the ER for dental-related problems. For the analysis, we calculated the number of visits, total and average charges by hospital, by age group by hospital and by type of payor (e.g., commercial insurance, public program, or self-pay). Some of the hospitals also provided data on the frequency of each diagnostic code, time-of-day of the visits, and their reimbursement-to-charges-ratio.

The specific list of ICD-9 codes (521.0-526.9) was selected in consultation with a dentist to include, as much as possible, dental diagnoses not related to accidents or trauma, and dental conditions not complicated by diabetes, HIV, or other underlying chronic health conditions. The ICD-9 codes provide a basis for selecting the visits most likely to reflect preventable dental problems or those related to lack of regular dental care. Cases with a primary diagnosis of broken tooth (ICD-9 code 873.63), for example, were not included in the selected cases.

The visits and charges were grouped into four categories of payors: public program, commercial, Medicare, and self-pay. The grouping was based on the insurance name and category provided by the hospitals. In most cases, the names were easily classified. Public programs included Medicaid, MinnesotaCare (Minnesota's version of CHIP), Medical Assistance, and related programs. In a small number of cases, the name of the insurance provider was not sufficiently detailed to determine whether it was a commercial or public program, and these cases were grouped in the commercial category; for example, the payor name listed was "Blue Cross," which runs both commercial and public programs. Thus, the estimate of the percentage of visits and charges to public programs is likely to be an underestimate.

Results

Table 1 shows the number of visits, total charges, and average charge per visit for each of the five hospital systems. During

Table 1 Number of Dental-Related Emergency Room Visits and Total Charges by Hospital

	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E	All hospitals
Total visits	6,648	1,728	994	667	288	10,325
Total charges ($)	2,655,236	1,014,620	572,804	349,685	151,174	4,743,519
Average charges per visit ($)	399	587	576	524	525	459

the 1-year period, there were 10,325 ER visits for dental-related problems, exclusive of traumatic injuries. The majority of visits (64 percent) occurred at one hospital, the area's largest county hospital. While these visits represented only a small fraction of all hospital ER visits, most of the visits were for conditions that could have been prevented or could have been treated more effectively by a dentist. The hospitals charged a total of nearly $5 million (both facility and physician charges) for these visits, about half of which was paid. The charges for these visits averaged $459 per patient, with the average charges per hospital ranging from $399 to $587.

Table 2 presents the number of visits and average charges by age group for each hospital. The majority of patients (80 percent) were between 20 and 50 years of age. While the average charge per visit varies across age groups, there is not a consistent pattern of differences across ages and hospitals. It is not the case that the average charge is higher for children than adults or for elderly patients relative to children.

One concern about treatment of dental problems in a hospital ER is the lack of follow-up care and treatment. The data provided by the hospitals included all ER visits with a primary diagnosis based on the designated ICD-9 diagnostic codes; admitted patients and in-patient charges were not included. In addition, we asked the hospitals to determine how many of the patients were seen in the ER more than once. Table 3 shows the frequency of return visits for dental diagnoses. About 80 percent of the patients had only one visit during the year for a dental-related diagnosis, while the remainder had between 2 and 11 dental-related visits to the ER. We were unable to calculate charges specifically for these repeat visits based on the data, but if we use the average charge per visit for all visits ($459), there were 2,499 second or higher visits with total charges estimated to be about $1,147,000.

Table 4 identifies the percentage of charges associated with each of four general types of payor: public programs excluding Medicare, commercial, self-pay, and Medicare. The majority of the visits for dental-related problems to the ER were charged to public programs, mostly Medicaid, MinnesotaCare, and related programs. At two of the hospitals, nearly three-quarters of the visits and charges were charged to Medicaid. The other hospitals had a lower percentage charged to public programs, but in all cases more than half. Commercial

Table 2 Number of Dental-Related Emergency Room Visits and Average Charges by Age Group

Number of visits	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E
Ages 0 to 5	47	30	13	3	125
Ages 6 to 12	70	35	11	5	85
Ages 13 to 19	484	122	84	43	78
Ages 20 to 50	5,525	1,395	813	565	0
Ages 51+	522	146	73	51	0
Average charges per visit					
Ages 0 to 5 ($)	445	556	521	726	546
Ages 6 to 12 ($)	483	481	767	424	513
Ages 13 to 19 ($)	384	664	571	446	503
Ages 20 to 50 ($)	398	574	562	531	n.a.
Ages 51+ ($)	416	684	717	512	n.a.

n.a., not applicable.

Table 3 Frequency of Repeat Visits to the Emergency Room for Dental-Related Problems

Percentage of visits	Hospital A	Hospital B	Hospital C	Hospital D	Hospital E	All hospitals
1 visit (%)	78.1	79.3	86.6	86.0	94.5	80.3
2 visits (%)	14.1	13.6	9.3	9.9	5.1	12.9
3 visits (%)	4.6	4.0	2.7	3.6	0.4	4.1
4 or more visits (%)	3.1	3.0	1.5	0.5	0.0	2.7
Total patients	4,894	1,297	826	557	272	7,846

Table 4 Charges for Dental-Related Visits by Type of Payor

Percentage of charges in each category	Hospital A*	Hospital B	Hospital C	Hospital D	Hospital E
Public (%)	72.3	58.6	55.1	75.7	69.4
Commercial (%)	7.1	16.4	19.4	13.0	18.8
Self pay (%)	12.3	18.1	19.0	1.3	11.8
Medicare (%)	5.7	7.0	6.4	9.9	0.0
Number of visits	6,648	1,728	994	667	288

* About 3 percent of visits to this hospital had payor coded as unknown. "Public" payors include government programs such as Medicaid, SCHIP, etc. for low-income persons. Assignment to payor categories is approximated based on name of insurance or name of payor as provided by the hospital. Reimbursements were estimated to be about 50 percent of total charges, on average.
SCHIP, State Children's Health Insurance Program.

insurance covered the charges in less than 20 percent of the visits. Six to 7 percent of the visits were coded as covered by Medicare. While Medicare does not cover dental care, it will cover ER visits even for a primary diagnosis of a dental-related problem. A substantial proportion of the visits were not covered by public or commercial insurance programs and so were coded as self-pay. The hospitals estimated that about half of total charges across all forms of reimbursement were paid.

Only three of the hospitals provided us with information on the specific diagnosis codes for each visit, although all used the same list of codes to extract the data on visits. Most of the visits had a primary diagnosis code of 525.9 (dental disorder NOS), ranging from 45 to 60 percent of the visits at each of these three hospitals. The next most common diagnosis codes were 522.5 (periapical abscess), 521.0 (dental caries), and 523.3 (acute periodontitis). The three most common diagnoses (dental disorder NOS, periapical abscess, and caries) were the same as found in a study of dental-related ER visits of adults on Medicaid in Maryland (12).

One hospital was able to provide us with data on the day of the week and time of day by shift. Most of the visits to the ER occurred on weekdays during hours when many dentist offices are open. Almost 75 percent of the visits were during the week, and of those, about three-quarters were between 8 AM and 8 PM. Thus, for a majority of these visits, the patients were not going to the hospital ER because dentists' offices were closed. The results show that the offices were open but, for whatever reason, they were not accessed by these ER patients. In other words, the use of the ER was often not related to the need for after-hour care.

In order to provide a comparison with an insured population, we obtained similar data for a large group with employer-based commercial dental insurance and from two county-based purchasing health plans. First, from a single large employer in the Minneapolis area, we obtained an aggregate count of ER visits for the same list of ICD-9 codes for all employees and dependents in the employer's health and dental plans for the same 1-year period. Only 25 dental-related visits to hospital ERs were reported for the year and all were paid by commercial insurance. These 25 visits represented 0.08 percent of a pool of approximately 32,000 employees and dependents covered by the employer's plans. This small number of dental emergency visits clearly shows that for a population with insurance, access to regular dental care greatly reduces the chances that they will visit the hospital ER for a nontrauma dental-related problem. For patients with access to regular dental care, either the condition is treated at an earlier stage or patients in discomfort can obtain relief from their dentist rather than the ER.

We also obtained similar data from two county-based health plans that assure dental coverage for their enrollees. In Minnesota, state-approved county-based plans purchase health-care services for eligible residents enrolled in Minnesota health care programs (Medical Assistance, General Assistance Medical Care, and MinnesotaCare).* The two programs that provided data for this study serve primarily rural counties. For both county-based health plans, the number of dental-related visits to hospital ERs was quite low during a 1-year period. For one county-based health plan, only 20 dental-related visits to hospital ERs were recorded for nearly 8,000 enrollees (0.25 percent of enrollees). The other county plan recorded 121 such visits for roughly 10,000 enrollees (1.2 percent of enrollees).

These results provide evidence that use of the ER for dental problems is much less common for those with insurance or who are part of a system that assures access to dentists willing to accept patients from public programs. One of the specific goals of Minnesota's county-based purchasing approach is to improve access to providers in rural counties and to improve coordination of services. This approach apparently has been successful.

* Information on county-based purchasing plans in Minnesota is available at http://www.health.state.mn.us/divs/hpsc/mcs/cbpinfo.htm [accessed on December 10, 2008].

Discussion

While the number of dental-related visits represents only a small fraction of all ER visits, many of these visits are associated with high, avoidable costs and, because of incomplete treatment and inadequate follow-up, repeat ER visits. While about 80 percent of the patients were seen only once in the ER for a dental problem, nearly one quarter of the visits were second or higher visits to the same ER for a dental problem. Whether the repeat visit was for the same problem could not be determined in this study. But it seems likely that the patient had ongoing or underlying dental conditions that were not or could not be resolved by the intrinsic dental care limitations of ERs.

The results show that use of the ER for dental problems is much less common for those with commercial insurance and those who have access to dentists willing to accept patients from public programs. While we cannot directly compare the frequency of ER visits on a per capita basis, the very small number of dental-related visits for those with commercial dental insurance and those in the county-based plans suggests fewer acute, untreated dental problems.

The majority of visits for dental-related ER visits were paid by public programs, suggesting that a careful examination of the cost-effectiveness of alternative policies is needed. Many of these patients may have gone to the hospital ER for dental problems because they lacked a regular dentist or access to a dental clinic that will accept their health coverage. An urgent-care dental facility or the use of dental therapists in CHC would provide an alternative to costly hospital ER care and would likely provide a more complete range of care for dental problems. Given the limited options for treatment of dental problems in an ER, the underlying cause of the immediate pain or problem is often left untreated. Thus, the more complete care available in a dental clinic would reduce the need for repeat ER visits.

Another possible option is for hospitals to have dentists on call for emergencies. However, given that few hospitals currently do this, it is likely that their fiscal analyses have shown that the costs outweigh the potential revenues under the current health insurance system. Moreover, the study finding that few of the employees with commercial dental insurance coverage used ER services for dental problems suggests that the issue is not what services are available in ERs, but how best to provide access to dental services so that patients do not need to use an ER for dental problems. Further study into the reasons why patients use ERs for dental services could help inform discussion about policy solutions.

The large number of visits for children age 0-5 years is a concern. While we found that only 2 percent of dental-related ER visits were for children age 5 and under, these are 218 children for which the existence of dental problems early in life may be a precursor to very costly procedures in the future. For example, restorative care on an outpatient basis for restorations of multiple carious teeth may incur charges of $10,000-$12,000 per case, and also incurs the risks of general anesthesia. Access to dental insurance and to preventive dental care may be especially cost-effective for this group.

The findings of this study complement similar studies performed in other locations, providing evidence that the use of ERs for avoidable dental problems is a widespread concern. A recent California study reported that patients often "receive cursory treatment for urgent care conditions" when they seek care in the hospital ER for dental problems (13). In our study, nearly one-quarter of the dental-related ER visits were repeat visits, and we estimate that at least 17 percent of the visits in California were repeat visits based on the data reported.[†] These percentages underestimate the frequency of return visits because of the limited time period available for tracking patients. Nonetheless, in both studies the results indicate that treatment was incomplete in a large number of the cases.

The results of this study also build on earlier studies linking lack of private dental insurance to use of hospital ERs for dental complaints. As in this study, the California study found that the vast majority of ER visits for avoidable dental problems were charged to public programs (e.g., Medi-Cal) or the patient (self-pay) (13). Based on national data, another study concluded that insurance status is a key factor affecting the likelihood of seeking care for a dental problem in a hospital ER (14). In addition, a study in Maryland showed that visits to hospital ERs increased after a policy change that eliminated reimbursements to dentists (12). Together, these studies provide strong evidence that those who use hospital ERs for avoidable dental problems do not have private dental insurance and have limited access to regular dental care.

Study limitations

This study has several limitations. The data are from one state, and thus are not generalizable to the country as a whole. We cannot be certain that these visits were all truly for preventable dental conditions, though we attempted as best we could to do so. Several assumptions had to be made about classifying the charges by type of payor which may have resulted in an undercount of those charged to public programs. The hospitals provided information on outpatients only. Patients admitted to the hospital were not included in the count of ER visits or charges. Thus, this study underestimates the total charges for dental-related problems treated in

[†] The California study (see note 13) reports that 92 percent of patients had only one visit during the time period studied, while 6 percent had two visits, and 2 percent had three or more. We assumed that patients with three or more visits averaged 3.8 visits (based on our Minnesota data), and calculated the number of second or higher visits as a percentage of total visits.

hospitals. Finally, we do not have direct evidence on the reason(s) why the person went to the ER rather than to a dentist. Despite these potential limitations, given the limited information available nationwide on dental-related ER visits, this study provides unique information on an important public health problem.

Conclusions

Access to preventive dental care is a critical public health problem in the United States, particularly for those with low incomes, those without insurance, and those covered by public programs such as Medicaid and CHIP. As a result, patients seek treatment in the ERs of hospitals for acute and often preventable dental problems. During a 1-year period, there were over 10,000 visits to ERs in the five hospital systems for dental-related problems with total charges reaching nearly $5 million. The majority of these visits were charged to public health programs such as Medicaid. Patients without insurance and those without access to regular dental care – that is, patients without a dental home – appear to be much more likely to resort to the ER for dental problems than those with commercial coverage or those belonging to a county-based purchasing program in Minnesota. The frequency of repeat visits suggests that the underlying dental problem frequently was not resolved and the patient was not able to gain access to a dentist.

The use of ER facilities for treatment of dental problems is both expensive and in many cases ineffective because of the limitations of treatment options. New public health policy initiatives are needed to improve access to and effectiveness of oral health care. Improved reimbursements for care to Medicaid/CHIP patients may lead to more dentists being willing to provide these patients with a dental home. Access may also be improved by expanding workforce and training programs, such as Alaska's Dental Health Aide Therapists or Minnesota's recently passed dental therapist program, which provide training for mid-level oral health providers. Further expansion of CHC will create more opportunities for primary medical and dental care. Expansion of these initiatives and other policy changes are needed to improve access to regular dental care and to provide alternatives that provide more complete and less costly care for oral health problems than do hospital ERs.

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