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Blood Pressure Screening Practices of a Group of Dental Hygienists: A Pilot Study

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Purpose. Recent research suggests that one in five Americans has hypertension, according to the American Heart Association. When hypertension is undiagnosed or uncontrolled, it places patients at risk for other cardiovascular diseases, contributing to an increase in mortality. Dental hygienists are in an ideal setting to screen for this silent disease. This study was designed to determine how frequently a group of practicing dental hygienists performs screenings for hypertension on their patients, and to determine the barriers that prevent this screening from occurring.

Methods. One hundred one dental hygienists were questioned with a written survey about their blood pressure screening practices and their reasons for not taking blood pressure readings, if applicable.

Results. Sixty-seven dental hygienists completed the survey. Survey results revealed that the majority of dental hygienists were not recording blood pressure readings, even though their dental hygiene school curriculum had emphasized doing so for all patients. The most frequently cited reasons for not performing a routine blood pressure screening were insufficient time in the appointment and the minimal value given to the procedure by their employers.

Conclusion. To work against obstacles that prevent the provision of this service, dental and dental hygiene faculty must increase their efforts to inculcate in their students the value of blood pressure screening. Further studies are needed to determine if the findings of this study are indicative of only one segment of dental hygiene practitioners, or if they represent the norm in the profession.

Keywords: hypertension, high blood pressure, dental hygienists, dentists

Introduction

Hypertension, or high blood pressure (HBP), is defined as having a systolic pressure of 140 mm Hg or higher and diastolic pressure of 90 mm Hg or higher.¹ If not properly controlled, hypertension can lead to stroke, heart attack, heart failure, or kidney failure. According to the American Heart Association, one in five Americans has hypertension, and 31.6% of these people are asymptomatic and unaware of their condition.¹ In addition, it is estimated that hypertension precedes the development of congestive heart failure in 91% of cases.^{1,2} Furthermore, high blood pressure is associated with a two to three times greater risk of developing congestive heart failure.²

In both 1999 and 2000, heart disease was the first cause of death in the United States, and stroke was the third.³ Although the number of deaths from heart disease and stroke decreased between 1999 and 2000, the number of deaths directly related to high blood pressure increased by 3.2%.³ Preliminary data for 2001 showed a further increase to 8.7 deaths per 100,000 from hypertensive heart disease and 6.7 deaths per 100,000 from stroke.³

The prevalence of HBP among people living in the Southeast is greater than in any other region of the United States.¹ Death rates from stroke are also higher in this area. One of the reasons that these statistics are significant is the large African American population in the southeastern United States. On average, African Americans develop high blood pressure earlier in life and have a higher average blood pressure than Caucasians.¹ As a result, African Americans have a higher rate of stroke, heart disease, and end-stage kidney disease.^{1,4}

According to the Framingham Heart Study conducted by the National Heart, Lung, and Blood Institute (NHLBI), there is a 90% likelihood that men and women between 55 and 65 years old will develop high blood pressure within 10 years.¹ Since the life expectancy of Americans is increasing, there is an increased likelihood of death from high blood pressure-related illnesses.⁵ In 2001, there were 2,064 deaths per 100,000 from heart and cerebrovascular diseases in people 65 years and older.⁶

In 1972, the NHLBI of the National Institutes of Health developed the National High Blood Pressure Education Program (NHBPEP). At that time, fewer than one-fourth of the United States population were aware of the connections between hypertension, heart disease, and stroke.⁷ The NHBPEP consists of a network of groups interested in the prevention and control of hypertension. Federal agencies, professional organizations, state health departments, and community-based programs join forces, as the NHBPEP, to provide both educational materials and screening opportunities for early diagnosis of high blood pressure.

Once hypertension has been diagnosed, the American Academy of Family Physicians reports that its treatment is "very effective." Treatment ranging from lifestyle changes, including a low-sodium diet, regular aerobic exercise, and weight loss, to the use of antihypertensive drugs resulted in a 57% decrease in stroke mortality and a 50% decrease in mortality from coronary artery disease from 1972 to 1994.⁸

A 2002 journal report by the American Heart Association stressed the need for additional measures to identify hypertensive patients. In this report, Daniel W. Jones, MD, Associate Dean of the School of Medicine at the University of Mississippi Medical Center, stated, "We need to renew our efforts together to make sure that more people have their blood pressure measured, and their hypertension recognized and treated."⁹

Children as well as adults need to be screened routinely for hypertension, as elevated blood pressure in children is not uncommon.^{1,10} Le Jeune and Gordy suggested that dentists may have better opportunities to screen children for hypertension than medical doctors. According to them, children from poor families may not use medical services except in emergencies, but they may visit a dentist as part of the Head Start program or other state or federal programs.¹⁰

Dental Involvement

American Dental Association (ADA) delegates voted in 1974 to become a part of the NHBPEP.¹¹ Procedures for medical referrals were developed by the ADA Council on Dental Health and Health Planning, and members were encouraged to conduct screenings for high blood pressure in their dental practices. A 1977 ADA survey of dentists indicated that only 6.7% routinely recorded blood pressure readings on all of their patients.¹² However, in 1985, the ADA Council on Dental Health and Health Planning reported that 25% of dentists were performing blood pressure screenings. Unfortunately, fewer than 7% of these dentists reported doing so on a routine basis.¹³

A 1981 survey of New Jersey dentists reported enthusiasm for continuing education training for high blood pressure screening, with 70% of the respondents reporting willingness to take such courses.¹² Of the 783 dentists in this study who reported owning equipment to record blood pressure, only 48.6% regularly conducted readings on their patients. Eleven percent of the respondents reported discontinuing blood pressure measurements because of time constraints, the potential for false positive results, and fear of intruding into areas of responsibilities belonging to physicians, thus damaging their existing professional relationships.¹²

In 1998, Glick urged dentists to take a primary role on the multidisciplinary team involved in treating and educating patients at risk for hypertension. He stated that professional duties should not be limited to the provision of dental care, as oral health care providers can have a significant impact on the prevention, detection, evaluation and treatment of patients with high blood pressure.¹⁴ He further challenged dentists to become proactive in the overall health care of their patients.

In order to prevent medical emergencies in the dental office, Nunn recommended monitoring each patient's vital signs, especially blood pressure.¹⁵ When Carlin and Rothenberger surveyed dental offices in Nebraska to assess attitudes concerning blood pressure screening in oral health care settings, 82% of the respondents agreed that it was appropriate to record blood pressure in the dental office. However, fewer than half of the respondents reported they actually provide this service.¹⁶ Paulsen and Toevs reported that only 15% of a patient population surveyed at Weber State University had ever had their blood pressure taken in a dental office.¹⁷

Dental Hygiene Involvement

In 1982, the American Dental Hygienists' Association (ADHA) endorsed the routine measurement of blood pressure for all patients. At that time, the standards developed included blood pressure readings as part of the general health assessment data.¹⁸

Cline and Springstead additionally encouraged dental hygienists to routinely monitor patients' blood pressure as a part of total patient care. These researchers identified dental hygienists as preventive specialists with the education and training necessary to "convey to the patient an appreciation of hypertension control as a life-long endeavor."¹⁹

While experts agree on the need for early detection of hypertension through routine blood pressure monitoring, not enough information exists regarding the utilization of this procedure by dental hygienists. The purposes of this study were to determine the blood pressure screening practices of a small group of practicing dental hygienists and to identify the barriers, if any, that prevent this screening from occurring.

Materials and Methods

A convenience sample of participants from the Medical College of Georgia (MCG) Department of Dental Hygiene Alumni Day continuing education program was utilized for the study. A written survey concerning the routine blood pressure screening of dental office patients (Figure 1) was included in each registration packet. The only instruction given to participants was the verbal directive by the program moderator to complete any course evaluations and surveys anonymously and to place them in the appropriate containers in the back of the meeting room. Sixty-seven of the 101 registrants, 66.3%, participated in the study by completing the survey. The responses of one hygienist who was no longer practicing, according to notes left on the survey, were disregarded. A regression analysis was utilized for data comparisons.²⁰

Figure 1: Blood Pressure Screening Survey of Dental Hygienists at the Department of Dental Hygiene, School of Allied Health Sciences, Medical College of Georgia

The literature suggests that approximately one in four U.S. adults has HBP, which is defined as taking antihypertensive medication or having either a systolic blood pressure (SBP) of > or = 140 mmHg or a diastolic blood pressure (DBP) of > or = 90 mmHg.¹

The purpose of this study is to investigate whether practicing dental hygienists routinely take blood pressure readings on their patients. Information from this survey will be utilized in the development of future educational modules.

By completing this questionnaire you are voluntarily providing consent to participate in this study. Your responses will be confidential.

Please answer the following questions as honestly as possible.

Do you take BP readings? <input type="checkbox"/> On all patients <input type="checkbox"/> Only on patients reporting a history of hypertension <input type="checkbox"/> Only if patient requests it <input type="checkbox"/> Rarely <input type="checkbox"/> Never	If you do not take BP, why not? Check all that apply. <input type="checkbox"/> Too little time in appointment <input type="checkbox"/> Procedure not valued by patient <input type="checkbox"/> Procedure not valued by dentist/employer <input type="checkbox"/> Uncomfortable with personal skill to perform this task <input type="checkbox"/> Equipment not available
Was this procedure emphasized in your DH curriculum? <input type="checkbox"/> For all patients <input type="checkbox"/> For some patients <input type="checkbox"/> No	Are you familiar with the medications used to control hypertension? <input type="checkbox"/> Very familiar <input type="checkbox"/> To some extent <input type="checkbox"/> Not at all
Your suggestions for providing updated BP information to dentists and hygienists include: Check all that apply. <input type="checkbox"/> CE Lecture <input type="checkbox"/> Informational pamphlets <input type="checkbox"/> Web-based CE course <input type="checkbox"/> None is needed <input type="checkbox"/> Other _____	Do you routinely review the patient's medical history? <input type="checkbox"/> Always <input type="checkbox"/> Only on new patients <input type="checkbox"/> Only when patients report changes to their health status <input type="checkbox"/> Rarely <input type="checkbox"/> Never
How long have you been practicing dental hygiene? <input type="checkbox"/> Between 0-5 years <input type="checkbox"/> Between 5-10 years <input type="checkbox"/> Between 10-20 years <input type="checkbox"/> More than 20 years	In what type of setting do you practice? <input type="checkbox"/> General dental practice <input type="checkbox"/> Periodontics <input type="checkbox"/> Oral surgery <input type="checkbox"/> Hospital based clinic <input type="checkbox"/> Public Health <input type="checkbox"/> Educational Institution <input type="checkbox"/> Other: _____
Are you an MCG alumnus? <input type="checkbox"/> Yes <input type="checkbox"/> No	In which state do you practice? <input type="checkbox"/> Georgia <input type="checkbox"/> Florida <input type="checkbox"/> South Carolina <input type="checkbox"/> Other:

1. State-specific trends in self-reported blood pressure screening and high blood pressure--United States, 1991-1999. MMWR - Morbidity & Mortality Weekly Report. 51(21):456-60, 2002 May 31.

Figure 1. Blood Pressure Screening Survey of Dental Hygienists at the Department of Dental Hygiene, School of Allied Health Sciences, Medical College of Georgia.

Results

While 60 of the dental hygienist participants in this study reported routinely reviewing their patients' medical histories, only five dental hygienists reported recording blood pressure readings for all patients (Figure 2). Ten participants reported taking blood pressure readings only on patients reporting a history of hypertension, and an additional seven reported taking readings only upon patient request. Of the five dental hygienists who reported taking blood pressure measurements on all

patients, three were graduates of the Medical College of Georgia dental hygiene program, and four had practiced for more than 20 years.

Figure 2: Survey Results

Numerals represent the number of responses per item. Some surveys listed multiple responses to the questions, thus the total responses for these questions exceed the number of actual participants.

<p>Do you take BP readings?</p> <p>5 On all patients 10 Only on patients reporting a history of hypertension 7 Only if patient requests it 21 Rarely 23 Never</p>	<p>If you do not take BP, why not? Check all that apply.</p> <p>33 Too little time in appointment 7 Procedure not valued by patient 21 Procedure not valued by dentist/employer 5 Uncomfortable with personal skill to perform this task 13 Equipment not available</p>
<p>Was this procedure emphasized in your DH curriculum?</p> <p>54 For all patients 7 For some patients 5 No</p>	<p>Are you familiar with the medications used to control hypertension?</p> <p>17 Very familiar 49 To some extent 0 Not at all</p>
<p>Your suggestions for providing updated BP information to dentists and hygienists include: Check all that apply.</p> <p>51 CE Lecture 24 Informational pamphlets 15 Web-based CE course 3 None is needed 1 Other _____</p>	<p>Do you routinely review the patient's medical history?</p> <p>60 Always 4 Only on new patients 7 Only when patients report changes to their health status 0 Rarely 0 Never</p>
<p>How long have you been practicing dental hygiene?</p> <p>12 Between 0-5 years 15 Between 5-10 years 19 Between 10-20 years 20 More than 20 years</p>	<p>In what type of setting do you practice?</p> <p>56 General dental practice 4 Periodontics 1 Oral surgery 0 Hospital based clinic 2 Public Health 3 Educational Institution 3 Other: pediatric practice</p>
<p>Are you an MCG alumnus?</p> <p>46 Yes 20 No</p>	<p>In which state do you practice?</p> <p>59 Georgia 0 Florida 10 South Carolina 1 Other</p>

Figure 2. Survey Results.

A positive, statistically significant association existed between those who had practiced dental hygiene for more than 20 years and those who routinely took blood pressure readings for all patients (Linear Logistic Regression; $p < 0.001$). Likewise, a negative association existed between those who had practiced for zero to five years or five to 10 years and those who routinely took blood pressure readings (Linear Logistic Regression; $p < 0.001$). These two groups were significantly less likely to take blood pressure readings on a routine basis.

Forty-four of the respondents, 66%, reported rarely or never taking blood pressure readings on their patients (Figure 3), although 81% (54 participants) reported that the procedure was emphasized in their dental hygiene curriculum. The reasons cited for not taking a blood pressure reading on all patients are listed in Figure 4. The most often cited reasons were insufficient time in the appointment (33 responses/ 50%) and a lack of value for the procedure by the dentist/employer (21 responses/ 31%). Thirteen study participants (19%) reported that blood pressure monitoring equipment was not available.

Figure 3: Blood Pressure Screening Practices

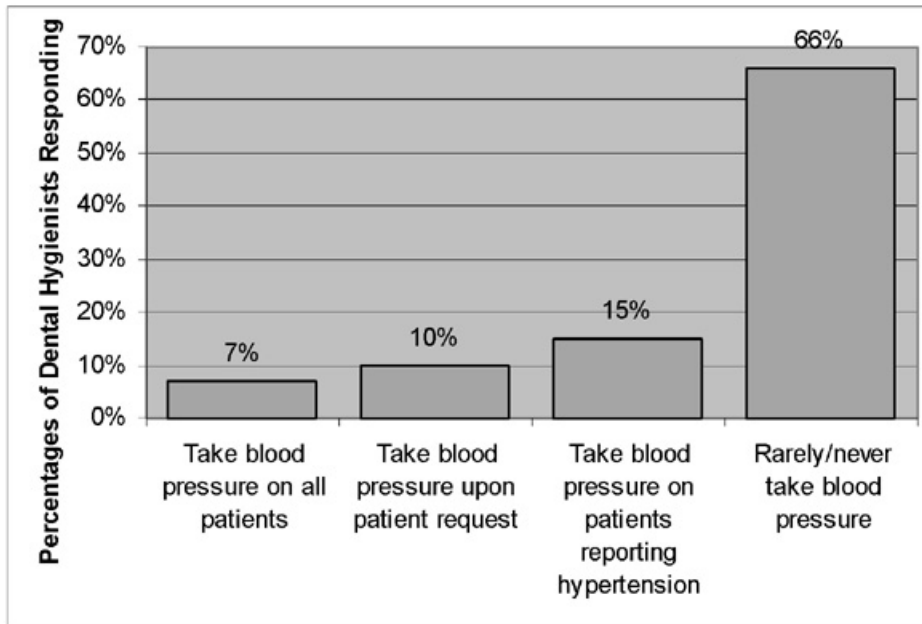


Figure 3. Blood Pressure Screening Practices.

Figure 4: Reasons For Not Taking Blood Pressure

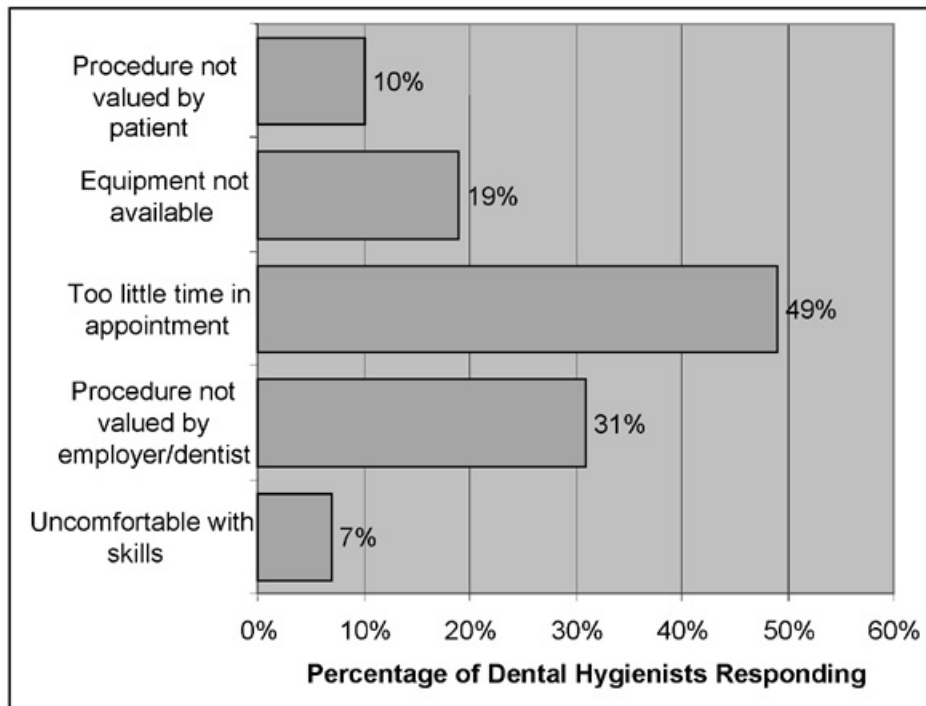


Figure 4. Reasons For Not Taking Blood Pressure.

All study participants reported familiarity with the medications used to treat hypertension. Twenty-six percent reported they are very familiar with anti-hypertensive medications, and 74% replied they are familiar to some extent with the medications.

The majority of study participants practice in general dental practices in Georgia or South Carolina. Periodontal, oral surgery, pediatric, public health, and educational institutions were other practice settings listed. Of the responding dental hygienists, 46 were graduates of the Medical College of Georgia dental hygiene program. Those dental hygienists who reported practice in an educational institution were significantly associated with the routine recording of blood pressure readings for all patients, while those who worked in periodontics, public health, and others were negatively associated with routine blood pressure measurements (Linear Logistic Regression; $p < 0.001$).

Continuing education lectures and informational pamphlets were the most frequently chosen responses for suggestions to provide updated blood pressure information. Three participants reported they need no additional information.

Discussion

Given the potential number of oral health care patients who might suffer high blood pressure and the severity of the disease, it is disturbing that only five of the 66 dental hygienists completing the survey reported recording blood pressure measurements on all patients. Study participants reported an emphasis on the procedure in their educational backgrounds (Figure 5), yet appear to be victims of two major barriers to this screening. Half of the responders reported insufficient time in the dental hygiene appointment to perform this task, and this same barrier was reported by dentists as early as 1981.¹³ Thirty-one percent of the dental hygienists reported the dentist/employer did not value measuring patients' blood pressures, a perception that, perhaps, is due to the limited amount of time allotted for each patient.

Figure 5: Comparison of Curriculum and Practice

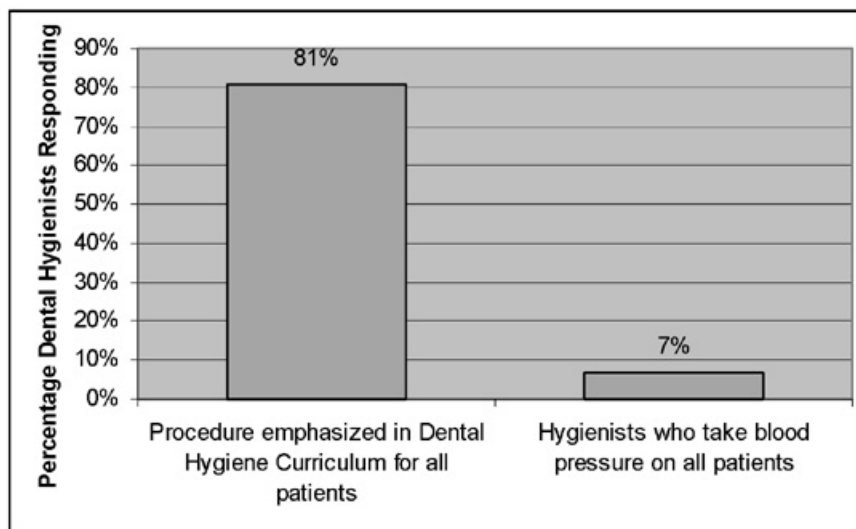


Figure 5. Comparison of Curriculum and Practice.

Ninety percent of the dental hygienists reported reviewing patients' medical histories, and all of the dental hygienists reported at least some knowledge of medications used to control hypertension. However, only 7% of the participants in this study reported providing a service endorsed by both the ADA and the ADHA.^{11, 18} Interestingly, those participants who practiced in educational settings were likely to report taking blood pressure readings, possibly because they have more time allotted for individual patient appointments or simply adhere to procedures being taught in the educational setting.

Responses were not usable to determine whether an association existed between dental hygienists who practice in a general dental practice setting and who routinely record blood pressure. However, since all but one of the dental hygienists reported working in Georgia and/or South Carolina-areas identified as having the highest prevalence of HBP in the nation¹-it is likely that these practitioners will encounter an increased number of patients suffering HBP and should diligently include this screening in the medical assessment phase of their treatments.

Limitations

While these results appear somewhat disturbing, there were several limitations to the study that possibly influenced the outcomes. First, the study utilized a convenient group of dental hygienists-attendees at an annual meeting-to survey. The group possibly included many dental hygienists who potentially have the same practice habits because they may practice in the same office or in the same geographic area. Therefore, this sample may not be a true reflection of the practices of all dental hygienists. Additionally, several questions resulted in too few combinations of responses to make any determination as to whether a positive association existed between the subjects' responses and whether they took blood pressure readings on all patients.

Conclusions

While the dental hygienists surveyed in this study reported knowledge of the medications used to treat hypertension and said that an ample emphasis was placed on the procedure during their clinical education, fewer than 8% reported that they actually record blood pressure readings on all patients. Participants who were MCG alumni did not routinely take blood pressure readings any more often than did graduates from the other dental hygiene schools represented at the continuing education seminar. Unfortunately, as seen in Figure 3, the most frequently cited reasons for not performing a routine blood pressure screening were "too little time in the appointment" and "procedure not valued by employer/dentist."

Recommendations

As the number of deaths from hypertensive heart disease, hypertension, and stroke continues to rise-along with an increase in the number of elderly people who may have high blood pressure-dental hygienists are in an ideal position to identify oral health care patients who are at risk. As valuable members of the healthcare team, it is imperative that dental hygienists make a concerted effort to incorporate this valuable screening into their daily treatment regimens. Ethical and legal responsibilities dictate that dental hygienists adhere to policies aimed at protecting not only the patients' oral health, but also their total health.

Both the American Dental Association and the American Dental Hygienists' Association have supported high blood pressure screening as an important aspect of patient care. A continued effort must be made by educators, both dental and dental hygiene, to reiterate the value of providing this service to patients. Time for this procedure should be allowed in each patient appointment. Clinicians should become comfortable with their skills in reading the patient's blood pressure and should stress the value of this service to their patients. Finally, the necessary equipment for blood pressure screening should be provided in all oral health care settings.

Continuing education courses with both didactic and hands-on components should address the further study of hypertension and blood pressure screening. Additional research may be necessary to determine if the findings of this project are indicative of only one segment of the dental hygiene population, or if these findings represent the norm among practicing dental hygienists.

Acknowledgements

Notes

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