

SHORT COMMUNICATION

## Descriptors of permanent teeth with cariously exposed pulp in patients presenting at a Nigerian hospital

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### Abstract

**Aim.** To describe the pattern of presentation of carious permanent teeth with pulp exposure and to determine factors associated with choice of treatment for such teeth. **Materials and methods.** All patients presenting at the oral diagnosis clinic of Lagos University Teaching Hospital Dental centre between January 2009 and June 2009 were examined and those with carious lesion involving the pulp were included in the study. The history and character of pain from teeth, extent of tooth structure lost, proposed treatment and reason for proposed treatment was recorded. **Results.** The tooth most affected by pulp exposure due to caries is the lower first molar (17.5%). Extraction was the treatment of choice for many patients due to the following reasons: obliterated root canals (30%), patients' preference (30%) and non-restorable teeth (22%). **Conclusion.** Extraction was the predominant treatment chosen for cariously exposed permanent teeth due to the condition of the tooth.

**Key Words:** dental caries, cariously exposed pulp

### Introduction

An upward trend in the prevalence and severity of dental caries has been reported among adolescent Nigerians [1]. Dental caries is a preventable disease and exposure of the pulp in a carious tooth is also preventable if patients present early. If caries is allowed to progress, then pulpitis will occur which may result in subsequent pulp necrosis, necessitating either endodontic treatment or extraction if the caries is not treated early [2]. Many patients in developing countries like Nigeria wait until they experience pain that interferes with eating, work or sleep before seeking treatment. Pain has been found to be the most common reason for demand of dental care in Nigeria [3]. Extraction of teeth is also the commonest dental treatment rendered in Nigerian hospitals [4].

Tooth loss as a result of dental caries affects function such as mastication and speech. Aesthetics is also compromised in the loss of anterior teeth. Replacement of lost teeth is often expensive and some patients do not replace their missing teeth because of the cost. Non-replacement of missing teeth can lead to drifting

of adjacent teeth, over-eruption of opposing teeth, periodontal lesions and further loss of teeth. Therefore, endodontic treatment may be regarded as a better option to eliminate these disadvantages.

Previous retrospective studies in Nigeria reported dental caries as the highest reason for endodontic treatment and extraction [5,6]. These studies were limited to the diagnosed oral diseases or problems leading to extraction or endodontic treatment. To the best of our knowledge, only anecdotal evidence exists on why one option was chosen in preference to the other. This study, therefore, aims to bridge the gap in knowledge on what factors guide the decision-making process in treatment of pulpally-exposed teeth in the population studied, especially in a facility in which both treatment options are available.

### Materials and methods

This study was a descriptive study of 106 consecutive patients presenting at the oral diagnosis clinic of the Lagos University Teaching Hospital with cariously exposed permanent teeth between January and June

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Table I. Number of permanent teeth with pulp exposure secondary to caries by tooth type.

Tooth type	Maxillary teeth, <i>n</i>	Mandibular teeth, <i>n</i>	Total, <i>n</i> %
Central incisor	6	2	8 (4.6)
Lateral incisor	4	2	6 (3.4)
Canine	3	2	5 (2.9)
First premolar	12	8	20 (11.5)
Second premolar	17	14	31 (17.7)
First molar	20	30	50 (28.5)
Second molar	16	18	34 (19.4)
Third molar	12	9	21 (12.0)
Total	90 (51.6)	85 (48.4)	175 (100)

2009. The study was carried out by means of a structured questionnaire which was filled in by the observing doctor. The data was collected by five doctors. The history character and severity of pain from teeth, type of carious cavity, extent of loss of tooth structure due to caries, radiographic findings, proposed treatment and reason for proposed treatment was recorded. The severity of pain was graded as mild, moderate or severe, as reported by the patient. The observers indicated on the questionnaire which tooth structure was lost due to caries, e.g. occlusal surface, lingual wall, buccal wall, mesial wall or distal wall. Demographic data including age, gender and educational level of the patients were also obtained.

The data obtained was analysed with Epi info 6 software. The chi-square test of association was used to determine differences between variables, which is said to be significant when *p* is less than 0.05.

## Results

A total of 106 patients aged between 20–65 years comprising 43 (41%) males and 63 (59%) females with 175 carious teeth with pulp exposure were seen. Sixty-five per cent of the patients had tertiary education, 24% had secondary education, 7% had primary education, while 4% had no formal education.

### *History of pain as reported by patients*

Thirty-three per cent of the patients presented after a 1–3 weeks history of toothache, while 63% presented after 3–6 weeks of toothache. Four per cent had no toothache before presenting at the clinic. Fifty-two per cent of the patients reported severe pain, 35.5% reported moderate pain and 11.8% reported mild pain.

### *Activities affected by pain*

Many (61.2%) reported that tooth ache disturbed their sleep; 76.7% reported that they could not eat

well due to toothache; and 36.3% reported that toothache disturbed their work.

### *Tooth type with cariously exposed pulp*

Table I shows the frequency of tooth types with pulp exposure. The tooth most affected by pulp exposure by caries is the lower first molar followed by the upper first molar and lower second molar.

### *Loss of tooth structure due to caries*

Only the occlusal surface was involved in the carious process in many teeth (65.7%). Among the other teeth, one wall was commonly lost (27.4%), followed by two walls (4.6%), three walls (0.6%) and four walls (1.7%).

### *Reasons for choice of treatment*

The major reasons for extractions were obliterated root canal (30%), patient's preference (30%), which is as a result of cost and time needed for endodontic treatment, and previous unpleasant experience. Some patients had more than one reason for choosing extraction. Third molars (8.2%), large dentoalveolar abscesses (5.5%), tooth mobility (4.6%) and dilacerated roots (0.9%) were other reasons for extraction of teeth with cariously exposed pulp.

Extraction was the treatment choice for 58.6% of the patients, while endodontics was treatment choice for 41.4%. Choice of extraction was significantly higher in patients who reported an inability to eat normally ( $p = 0.01$ ) and an inability to do their normal work ( $p = 0.03$ ). Also, extraction was the treatment option for 69.8% of those who reported severe pain, although this was not significant ( $p = 0.06$ ).

## Discussion

This descriptive study assessed the morbidity of teeth resulting from pulp exposure secondary to dental caries in permanent teeth of patients attending the oral diagnosis clinic of the Department of Preventive Dentistry of Lagos University Teaching Hospital and the management chosen for these teeth.

The lower first molars were the most affected by caries involving the pulp, followed by the upper first molar and lower second molar. This is in agreement to an earlier Nigerian study [7]. Out of 175 teeth with exposed pulp, 115 had occlusal caries only. This suggests that caries involves the occlusal pits and fissures more often than the smooth surface of the tooth. This is also in agreement with previous studies [1,8].

Pain is the most obvious symptom when there is pulp exposure as a result of a progressing carious lesion approximating the pulp. In this study, 90.2%

of the patients reported moderate-to-severe pain, which restricted them from their daily activities. This suggests that, if their normal daily activity is not disturbed, they may not present for treatment. Pain and inability to eat comfortably were the major reasons for patients choosing extraction over endodontic treatment. A WHO publication postulated that pain usually provokes an immediate demand for care aimed primarily at pain relief which usually results in extraction [9]. Zola [10] stated that it is not the patient's perception of illness but the subjective reaction to the medical condition which motivates a specific choice of treatment. A previous study [11] on choice of treatment in Malaysia concluded that patients chose extraction over preservation of teeth when having toothache because patients did not see the importance or the future benefit of tooth preservation rather than because of pain. This may also be true of the Nigerian population, although no research has been conducted to investigate this.

In contrast to a study in America in which more than half (57%) of the respondents contacted a dentist within a day or two [12], this study found that 63.3% of the patients delayed seeing the dentist for at least 3 weeks. This appears to be pathognomonic of the Nigerian population, as it corroborates findings in another Nigerian study [13] which also found that a proportion of the patients assumed that the dental visit would inevitably end in an extraction and, hence, would delay demand for dental treatment until quite late. This delay in presentation may be indirectly contributing to the predominant choice of extraction over endodontic treatment in this study as the three major reasons for choosing extraction in this study were obliterated root canals, non-restorable teeth and patient's demand for extraction. The first two reasons have been said to result from late presentation of chronic carious lesions [14].

Findings from this study may be further proof of a lack of awareness of the range of dental care available as well as poor attitude towards dental care amongst Nigerians, regardless of their level of education. Notably, 65% of our respondents had tertiary education. This is in contrast to the Malaysian study [11], which stated that the higher the level of education and income, the greater the awareness and concern for oral health.

It is our belief that targeted patient education on the benefits of tooth preservation as well as on the various options available for dental care may motivate patients to present early for caries prevention and treatment. The provision of adequate facilities and materials for tooth restoration in public hospitals would also encourage the practicing dentist to render optimal care to the patient and increase demand for such treatments. There is a need for continuous culturally-relevant

and issue-specific public education on dental care at the local, state and national level, so as to improve the dental awareness of the Nigerian populace and increase demand for conservative dental care as well as preventive care.

## Conclusion

The tooth most affected by pulp exposure due to caries is the lower first molar (17.5%). Extraction was the treatment of choice for many patients due to the following reasons: obliterated root canals (30%), patients' preference (30%) and non-restorable teeth (22%).

**Declaration of interest:** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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