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PULPOTOMY

Treatment of carious pulp exposures

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BACKGROUND

About 2.5 billion people are affected annually with untreated decay in their permanent teeth. With deep caries and extensive restorative procedures that expose or nearly expose dental pulp, irreversible pulpitis usually results and is often accompanied by intermittent or continuous pain. Vital pulp therapy is undertaken to address this situation, achieving apical closure and root development in immature permanent teeth by preserving pulp tissue vitality. Bioactive medicaments are placed on exposed pulp in vital pulp therapy so that inflammation can be resolved and tissue formation fostered. Calcium hydroxide was the earliest of these medicaments; a more recent development is mineral trioxide aggregate (MTA). Drawbacks to MTA include tooth discoloration, long setting time, difficulty handling the material, and high cost. As a result of these drawbacks, more medicaments have been developed for use in pulpotomy of permanent teeth, such as calcium-enriched mixture (CEM) cement, platelet-rich fibrin, and Biodentine. A systematic review was undertaken to compare the efficacy and cost-effectiveness of pulpotomy and associated medicaments in saving permanent teeth that have pulp exposure caused by caries.

METHODS

The Embase, MEDLINE, Web of Science, Trip Pro, Cochrane Library, International Clinical Trials Registry Platform, and ClinicaTrials.gov databases were searched for randomized controlled trials (RCTs) offering comparisons of pulpotomy and various medicaments or 2 or more medicaments used in pulpotomy. Seventeen studies reported in 21 articles were identified that met the inclusion criteria for analysis. Four studies reported on pulpotomy and other treatment modalities and 13 compared pulpotomy using different medicaments.

RESULTS

Pulpotomy Versus Other Treatments

All of these studies were performed on mature permanent teeth that had carious pulp exposures. Three reported outcomes of the same trial at different follow-up times, and 2 reported outcomes at various time points of another trial. Three compared the efficacy of pulpotomy with that of root canal treatment, whereas 1 compared pulpotomy with direct pulp capping.

When intention-to-treat pairwise analyses were done, pulpotomy using calcium hydroxide had greater success as determined radiographically than direct pulp capping after 60 months. No differences in clinical, radiographic, or overall success after 12 months were found for comparisons of pulpotomy with CEM cement and root canal treatment or for pulpotomy using MTA and root canal treatment. None of the studies investigated the cost-effectiveness of the treatments.

Pulpotomy Using Various Medicaments

Five trials compared MTA and calcium hydroxide. A pooled analysis of the data on immature and mature permanent teeth from these trials was done using the intention-to-treat principle. MTA was associated with higher success rates on all parameters after 12 months and had higher overall and radiographic success rates at 24 months compared to calcium hydroxide. Clinical success rates were comparable at 24 months.

When type of tooth was used to stratify the data, intention-to-treat analysis showed MTA had higher clinical and overall success rates after 24 months than calcium hydroxide in mature permanent teeth. The 2 medicaments showed no differences in the other outcomes. In addition, immature permanent teeth demonstrated no difference between MTA and calcium hydroxide on any treatment outcome.

MTA and CEM cement were compared in immature permanent teeth and mature permanent teeth. Intention-to-treat pairwise analyses reported MTA had higher radiographic success rates at 24 months compared to the CEM cement in mature permanent teeth. None of the other outcomes differed between the 2 medicaments.

MTA was compared to platelet-rich fibrin in immature and permanent teeth, to calcium hydroxide and platelet-rich fibrin in

Clinical Significance

Pulpotomy appears to be a possible substitute for root canal treatment for patients whose permanent teeth have carious pulp exposures. MTA is also a promising medicament for pulpotomy in permanent teeth, although newer medicaments are being developed to overcome some of the drawbacks of MTA. Several ongoing trials are testing these newer materials. Future studies should include a cost-effectiveness analysis based on treatment outcome alone so that alternative methods can be more completely analyzed, showing which choice offers maximum health benefits without cost restrictions.

mature permanent teeth, and to triple antibiotic paste and abscess remedy in immature permanent teeth. The data from these trials were subjected to intention-to-treat analysis and showed no difference in any outcome of pulpotomy in immature or mature permanent teeth. Cost-effectiveness was not analyzed.

DISCUSSION

Comparisons of pulpotomy and other treatment modalities tend to favor pulpotomy. When MTA was compared to other medicaments, it was shown to increase clinical and overall success rates at 24 months in mature permanent teeth, with other outcomes also often favoring MTA.

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RACIAL BIAS

Unconscious bias in clinical decision-making

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BACKGROUND

Bias is one's inclination to favor or not favor a person or group, allowing one's personal opinion to influence judgments. It can be explicit bias, which is expressed openly with an awareness that indicates the view is a reflection of the individual's attitudes and beliefs. Implicit bias is the result of subconscious thoughts or beliefs that can alter one's understanding, approach, or decision-making processes. Persons often aren't aware of their implicit biases. Although explicit bias has markedly declined, implicit bias persists. It has been suggested that race-associated differences in health outcomes may be attributable to racism. There are significant disparities in the outcome of health care between Black and White patients, with Black patients faring worse in treatment outcomes in nearly every category. Project Implicit was set up to permit people to take implicit association tests (IATs) to assess unconscious racial bias. Endodontic treatment is an effective treatment option for irreversible pulpitis and apical periodontitis in teeth with severe loss of tooth structure. An alternative is extraction, but the loss of a tooth can result in reduced occlusal stability, compromised esthetics, and damage to adjacent teeth related to replacement options. A study was undertaken to determine if explicit or implicit racial bias predicts the clinician's recommendation for root canal therapy or extraction for patients with irreversible pulpitis.

METHODS

Fifty-seven dentists working in the endodontic department of a hospital setting at the University of Cagliari, Italy, participated in the cross-sectional survey. They were randomly assigned by computer to review a clinical vignette depicting either a Black of White patient. The vignette indicated a diagnosis of irreversible pulpitis for which root canal treatment would be a valid treatment option (Figure 1). The same clinical case was included with either a Black or a White patient assigned to it. The examiners were asked to rate the likelihood that the patient's symptoms were caused by irreversible pulpitis and whether they would advise root canal treatment or extraction, along with the strength of their recommendation. Further questions were asked on the examiners' perception of the patient, whether they preferred treating Black or White patients, their feelings toward them, and their perceptions on how cooperative each group was. Demographic questions were also posed, as well as a set of pretest and posttest questions regarding their opinions regarding unconscious bias and IATs. Two Brief Implicit Association Tests (BIATs) were also administered.

RESULTS

Twenty-nine dentists were assigned to the Black patient and 28 to the White patient. The diagnosis of irreversible pulpitis was