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Original ARTICLE

To Determine Pulpal Sensory Thresholds In Human Teeth With Different Conducting Media

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ABSTRACT
Background: Dental pulp tests are investigations that provide valuable diagnostic and treatment planning information to the dental clinician. The present study was conducted to determine pulpal sensory thresholds in human teeth with different conducting media. **Materials & Methods:** The present study was conducted on 50 maxillary central incisors. The three conducting media tested were gel based product – Lox 2% Jelly and toothpastes- Sensodyne Repair and Protect & Meswak. The media were used in random order and each medium was tested twice on the tooth with 1 minute interval. The mean of the two threshold values for each conducting medium and the VAS scores were recorded. **Results:** In lox 2% jelly, 2% lidocaine was active ingredients, in sensodyne repair and protect toothpaste, Calcium sodium phosphosilicate (NovaminTM) Sodium monofluorophosphate was active ingredients and Meswak Toothpaste, Salvadorapersica extract was used. Sensory threshold in group I was 0.612 µA, in group II was 0.91 µA and in group III was 1.04 µA. The difference was significant (P< 0.05). The mean VAS score in group I was 5.12, in group II was 5.24 and in group III was 5.88. The difference was non- significant (P> 0.05). **Conclusion:** Authors found that Lignox 2% Gel proved to be superior to toothpaste when used as a conducting medium for EPT.

Key words: Lignox 2% Gel, Sensodyne Repair, Meswak

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INTRODUCTION

Dental pulp tests are investigations that provide valuable diagnostic and treatment planning information to the dental clinician. If pathosis is present, pulp testing combined with information taken from the history, examination, and other investigations such as radiographs leads to the diagnosis of the underlying disease which can usually be reached relatively easily.[1] Pulp sensibility tests (thermal and electric) are used to assess the condition of the nerves within the dental pulp and indirectly assess the pulpal health. Although, research depicts that cold test and electric pulp test (EPT) provide equally accurate diagnosis on status of pulp vitality in majority of the cases, EPT does have some limitations.[2] A positive response is indicative of vital sensory fibers present within the pulp, but information regarding the health or integrity of the pulp is still inconclusive. Attempts to connect the EPT results to the histological condition of the pulp continue to be unclear due to a number of variables such as the conducting media, gender, patient and doctor related factors.[3] A conducting medium is used between the tip of electric pulp tester and tooth surface for conductance and concentration of the electric field to invoke a threshold response from the patient.[4] The present study was conducted to determine pulpal sensory thresholds in human teeth with different conducting media.

MATERIALS & METHODS

The present study was conducted in the department of Endodontics. The study protocol was approved from institutional ethical committee. The study was performed on 50 maxillary central incisors. The three conducting media tested were gel based product – Lox 2% Jelly and toothpastes- Sensodyne Repair and Protect & Meswak. The media were used in random order and each medium was tested twice on the tooth with 1 minute interval. The tooth probe of the tester was coated with a thin layer of the test medium and a stimulus was applied on the tooth until felt by the participant. At the faintest sensation felt by the patient, the sensory threshold value and the pain scores were recorded. The mean of the two threshold values for each conducting medium and the VAS scores were recorded. Results were tabulate and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I shows that in lox 2% jelly, 2% lidocaine was active ingredients, in sensodyne repair and protect toothpaste, Calcium sodium phosphosilicate (NovaminTM) Sodium

monofluorophosphate was active ingredients and Meswak Toothpaste, Salvadorapersica extract was used.

Table I Conducting media used

S. No	Groups	Conducting media	Active ingredients
1	Group I	Lox 2% Jelly	Lidocaine 2%
2	Group II	Sensodyne Repair and Protect Toothpaste	Calcium sodium phosphosilicate (NovaminTM) Sodium monofluorophosphate
3	Group III	Meswak Toothpaste	Salvadorapersica extract

Table II Sensory threshold

Group	Group I	Group II	Group III	P value
Mean sensory threshold (µA)	0.612	0.91	1.04	0.01

Table II, graph I shows that sensory threshold in group I was 0.612 µA, in group II was 0.91 µA and in group III was 1.04 µA. The difference was significant (P< 0.05).

Graph I Sensory threshold

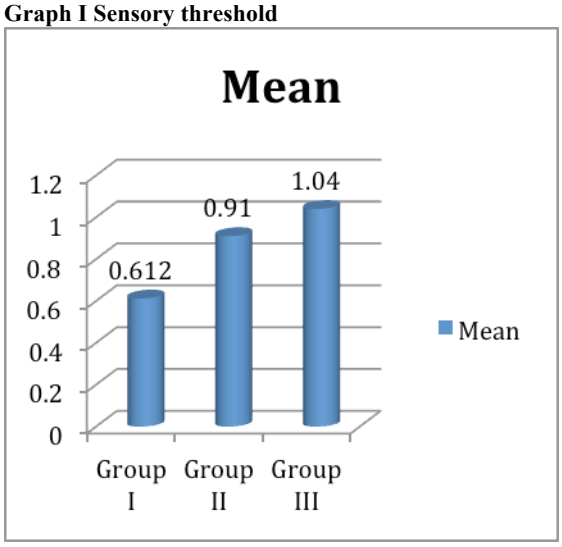
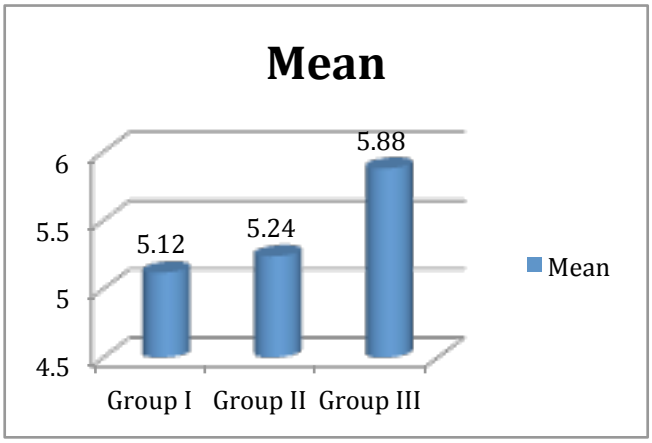


Table III VAS scores in all groups

Group	Group I	Group II	Group III	P value
VAS scale	5.12	5.24	5.88	0.25

Table III, graph II shows that mean VAS score in group I was 5.12, in group II was 5.24 and in group III was 5.88. The difference was non- significant (P> 0.05).

Graph II VAS scores in all groups



DISCUSSION

Clinicians performing pulp sensibility tests use the results, which are essentially qualitative sensory manifestations, to extrapolate and estimate the "vitality" and state of pulp health.[5] If the pulp responds to a stimulus (indicating that there is innervation), then clinicians generally assume that the pulp has a viable blood supply and it is either healthy or inflamed, depending on the nature of the response (with respect to pain, duration, and so forth), the history, and the other findings. The three types of responses can be summarized as follows.[6] The pulp is deemed normal when there is a response to the stimulus provided by the sensibility test and this response is not pronounced or exaggerated, and it does not linger. Pulpitis is present when there is an exaggerated response that produces pain.[7] Pulpitis can be considered as reversible or irreversible, depending on the severity of pain and whether the pain lingers or not. Typically mild pain of short duration is considered to indicate reversible pulpitis while severe pain that lingers indicates irreversible pulpitis. The absence of responses to sensibility tests is usually associated with the likelihood of pulp necrosis, the tooth is pulpless, or has had previous root canal therapy.[8] The present study was conducted to determine pulpal sensory thresholds in human teeth with different conducting media. In present study, 3 conducting media were used. In lox 2% jelly, 2% lidocaine was active ingredients, in sensodyne repair and protect toothpaste, Calcium sodium phosphosilicate (NovaminTM) Sodium monofluorophosphate was active ingredients and Meswak Toothpaste, Salvadorapersica extract was used. Chunhacheevachaloke et al[9] found that sensory threshold values elicited by Lox 2% Jelly was significantly lower than the other conducting media (P < 0.001). Gender wise comparison revealed that males have a higher sensory threshold value. Significant difference was noted between male and female readings in Lox 2% Jelly group (P = 0.003) whereas highly significant difference was noted in Sensodyne Repair & Protect (P < 0.001) and Meswak groups. We found that sensory threshold in group I was 0.612 µA, in group II was 0.91 µA and in group III

was 1.04 μA. The mean VAS score in group I was 5.12, in group II was 5.24 and in group III was 5.88. Lidocaine, the chief constituent of Lignox 2% Gel has a higher dissociation constant causing it to be more ionic in nature than benzocaine. This increased ionic nature of lidocaine resulted in its improved conduction of impulse in the present study. Sensodyne Repair & Protect when compared to Meswak showed better electrical conduction. Conduction of impulse through a medium depends on factors such as viscosity and surface tension between the medium and the tooth surface. Lower the surface tension, better will be the adaptation of the medium to the tooth which may result in improved conduction. The constituents of the toothpaste may also affect the conduction of electric impulses from the pulp tester to the tooth. One example is Sodium carrageen an a sea weed product, which is an ingredient in herbal toothpastes like Meswak. It acts as a stabilizer. It is known to increase viscosity of the toothpaste which may negatively affect its ability of conduction.[10]

CONCLUSION

This is found that Lignox 2% Gel proved to be superior to toothpaste when used as a conducting medium for EPT.

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