



Clinical Performance based Comparison of Knowledge Various Gutta Percha Solvents Amongst Dentist of India: A Survey

Rahul Maria^{1*}, Smita Dutta MDS², Puneet Gupta MDS³ and Sarita Chopra BDS⁴

¹Department of Dentistry, India

²Assistant Professor, College of Dentistry, Al Qassim University KSA

³Professor, Government College Of Dentistry, Indore, Madhya Pradesh

⁴Private Practitioner, Jaipur

*Corresponding Author: Rahul Maria, Department of Dentistry, India.

Received: May 14, 2019; Published: May 27, 2019

DOI: 10.31080/ASDS.2019.03.0551

Abstract

The objective of this study was to collect information regarding awareness of various gutta percha solvents available during the endodontic re-treatment by dentists. The knowledge of dentist was evaluated in a form of questionnaire designed on clinical performance of solvents and distributed among 200 dentists in India. The collected data was analyzed by using the SPSS version 22 software. Out of a total of surveyed dentists, the 75% response rate showed that this study was true representation of the endodontic re treatment performed by the dentists.

Keywords: Gutta Percha Removal; Gutta Percha Solvents; Endodontic Re-Treatment; Clinical Comparison

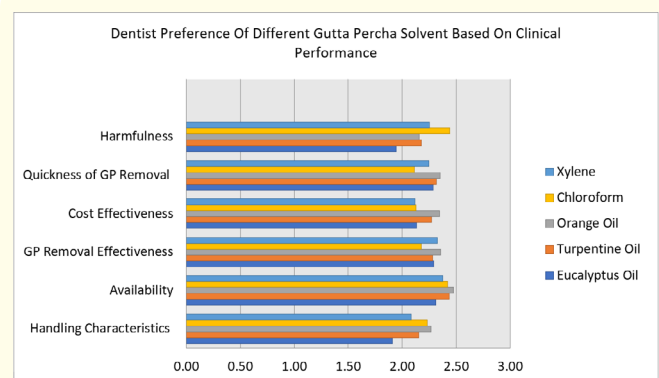
Introduction

Endodontic failures are not uncommon. As the frequency of endodontic treatment has increased in recent times, so is the probability of failure of endodontic therapy. Failed root canal treatment is unfortunate and at times unexplainable. Factors leading to root canal treatment failure have been extensively studied, microbial re-infection remains the most common factor leading to a failed endodontic therapy. Management of failed root canal treatment often requires re endodontic intervention. to re access the root canal system, the root canal filling needs to be removed to decrease the microbial load. Gutta percha is most common root canal filling material and its removal is desired during re-endodontics. There are various methods to remove gutta percha such as thermal, chemical, mechanical. This articles deals with the knowledge of dentist regarding performance of various gutta percha solvents.

Methodology

Close ended questionnaire was developed to collect Dentists opinion of Gutta Percha Solvents for removal of Gutta Percha in Endodontic Re Treatment Cases. A list of Endodontist was prepared. Convenience sampling method was used. The data was collected using online method. Google Forms was created to collect the data. A total of 200 dentists were invited to participate in the survey. 151 dentists responded to the request. However, all dentists did not respond to all questions.

Data was downloaded from Google Spreadsheet and transferred to SPSS for Windows (version 22) for analysis. The responses to questions were expressed as frequency and percentages as shown in tables 1, 2, 3. A likert scale was used to record dentist preference to the Gutta Percha solvents based on characteristics like Handling Characteristic, Availability, Gutta Percha removing effectiveness, Cost Effectiveness, Time Saving in removal of Gutta Percha and Harmfulness of the material. The score 1 represents dentist is least likely to use the product based on the characteristic and score 5 represents that the dentist is most likely to use the product. The data was represented as Mean and Standard Deviation as shown in Table 4 and Graph.



Graph 1: Dentist's Preference of different Gutta Percha Removal based on following characteristics.

		N	%
On an Average how many endodontic re-treatment cases you do in a month?	0-5	69	46.6
	5-10	16	10.8
	10-15	36	24.3
	More than 15	27	18.2
What type of Gutta Percha Solvents do you know?	Synthetic	57	39.3
	Natural	28	19.3
	Don't Know	3	2.1
	Both	57	39.3
What is the most commonly used Gutta Percha solvents by you?	Eucalyptus Oil	37	25.0
	Turpentine Oil	9	6.1
	Orange Oil	33	22.3
	Chloroform	29	19.6
	Xylene	35	23.6
	None of the Above	5	3.4

Table 1: Dentists Knowledge and Use of Gutta Percha Solvents.

Result

Results showed that dentists are not doing as many retreatment cases. 69 (46.6%) responded to doing as less as 0-5 cases per month. Only 3 (2.1%) did not know about any type of Gutta Percha Solvent. Other than turpentine oil all other Gutta Percha Solvents are being used. 5 (3.4%) responded to not using any Gutta Percha Solvent at all.

Unpleasant odour was reported for Turpentine Oil by 58 (53.2%) and Chloroform by 63 (52.9%). Other material reported pleasant odour i.e. EUCALYPTUS OIL by 76 (60.3%), ORANGE OIL by 85 (69.1%) and XYLENE by 41 (35.0%). All dentists reported

Dentist Response to Odour of Gutta Percha Solvents		Pleasant	Not Pleasant	Neutral
Eucalyptus Oil	n	76	32	18
	%	60.3	25.4	14.3
Turpentine Oil	n	34	58	17
	%	31.2	53.2	15.6
Orange Oil	n	85	16	22
	%	69.1	13.0	17.9
Chloroform	n	38	63	18
	%	31.9	52.9	15.1
Xylene	n	41	48	28
	%	35.0	41.0	23.9

Table 2: Dentist Response to Odour of Gutta Percha Solvents.

Dentist Response to Most Difficult part of removing Gutta Percha		Coronal	Middle	Apical
Eucalyptus Oil	n	15	18	84
	%	12.8	15.4	71.8
Turpentine Oil	n	9	22	67
	%	9.2	22.4	68.4
Orange Oil	n	10	17	88
	%	8.7	14.8	76.5
Chloroform	n	7	22	80
	%	6.4	20.2	73.4
Xylene	n	6	16	88
	%	5.5	14.5	80.0

Table 3: Dentist Response to Most Difficult part of removing Gutta Percha.

	Handling Characteristics			Availability			Gutta Percha Removal Effectiveness			Cost Effectiveness			Quickness of Gutta Percha Removal			Harmfulness		
	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Eucalyptus Oil	122	1.91	1.10	128	2.31	1.49	120	2.29	1.17	120	2.13	1.41	108	2.29	1.24	111	1.95	1.10
Turpentine Oil	106	2.15	1.06	110	2.44	1.36	102	2.28	1.11	103	2.27	1.20	88	2.32	1.18	102	2.18	1.20
Orange Oil	120	2.27	1.07	120	2.48	1.37	115	2.36	1.13	113	2.35	1.28	105	2.35	1.09	106	2.16	1.23
Chloroform	116	2.23	1.08	119	2.42	1.40	113	2.18	1.24	109	2.13	1.14	107	2.11	1.27	118	2.44	1.43
Xylene	117	2.09	1.02	119	2.38	1.30	120	2.33	1.25	111	2.12	1.13	113	2.25	1.23	110	2.25	1.25

Table 4: Dentist's Preference of different Gutta Percha Removal based on following characteristics.

M*=mean, SD=standard deviation

that removing Gutta Percha from Coronal Portion was not difficult. The difficulty in removing Gutta Percha from Apical part was reported most by XYLENE 88 (80.0%) and least with TURPENTINE OIL 67 (68.4%).

The handling characteristics of EUCALYPTUS OIL was rated least at 1.91 ± 1.10 and best for ORANGE OIL at 2.27 ± 1.07 . The availability was rated least for EUCALYPTUS OIL 2.31 ± 1.49 and best for ORANGE OIL 2.48 ± 1.37 . The effectiveness for removal of Gutta Percha was least for CHLOROFORM 2.18 ± 1.24 and best for ORANGE OIL 2.36 ± 1.13 . XYLENE was reported to be least cost effective and ORANGE OIL most cost effective 2.35 ± 1.28 . ORANGE OIL was reported quickest for removing Gutta Percha 2.35 ± 1.09 and CHLOROFORM was reported to take maximum time to remove Gutta Percha 2.11 ± 1.27 . EUCALYPTUS OIL was reported to be least harmful 1.95 ± 1.10 and CHLOROFORM to be most harmful 2.44 ± 1.43 .

Discussion

The result obtained in table 1 reflects the knowledge of gutta percha solvents amongst the dentist and number of retreatment observed by them. As far as the number of re-treatment is concerned it was found that only 46.6% of dentist reported doing not more than 5 re treatment cases per month. There are various factors depending on which the re treatment decision is made, such patient inflow in the clinic, the knowledge of decision making regarding the re treatment, alternative treatment offered to re-treatment, lack of knowledge, dentist attitude towards re treatment and patient choice. This could result in possible less number of re treatment done.

Since gutta percha removal is one of the steps in re treatment knowledge of various gutta percha solvents is required to obtain the desired result. Table 1 shows that natural gutta percha solvents are less known in comparison to synthetic solvents. 19.3% practitioners knew about the natural solvents whereas 39.3% knew about the synthetic solvents. This variation indicates that role of natural products in dentistry is yet not acquired fully and this lack of knowledge results in lesser usage.

Similarly the most commonly used solvents were eucalyptus oil 25.0%, xylene 23.6% and orange oil 22.3%. there was no statistical difference found in the use age of all three.

Table 2 shows the data obtained regarding the odor of the solvents. This quality is one significant one because unpleasant odor discourages operator to use the solvent irrespective of the better outcome. With the increasing attention being paid to make the clinic ambiance appealing, the environmental fragrance is an important aspect not only for the doctor but to please the patient as well. Any unpleasant odor is undesirable in most clinic set-ups.

76% of doctor found eucalyptus oil pleasant followed by orange oil 69.1% with turpentine oil 53.2% and chloroform 52.9% being least pleasant. One reason for finding eucalyptus oil pleasant could be because of the fact that it has been used in many house hold products and has been familiarized. House hold products that have eucalyptus oil are essence sticks, heena oil, wood polish etc.

There was general agreement in table 3. Regarding apical third be the most difficult area to remove gutta percha. This is very well known fact that root canal ramifications, aberrations and complications are more prominent in apical third of the root canal system. Accessory and lateral canals extend from the pulp to the periodontium. They occur 73.5% of the time in the apical third, 11.4% of the time in the middle third and 6.3% of the time in the cervical third of the root [1]. A hallmark of the apical region is its variability and unpredictability [2].

Graph 1 depicts that there is awareness among the dentist regarding the harmful effects of chloroform. Chloroform usage in dentistry has been under the radar and various studies and guidelines have been recommending its restricted usage due its harmful effects which includes carcinogenicity where as there are still many studies that deny the fact and recommend that small quantity used in dentistry has no detrimental effect on the tissues. Mattison, *et al.* [3] stated that, "In view of the FDA's ban on the use of chloroform from Accepted Dental Therapeutics, the continued use of this solvent cannot be justified." Such statements have increased the confusion regarding the usage of chloroform [4].

In the availability of the solvent not much variation was found this could be attributed to the modern technologies and internet which assist to gain access to mostly all products desired. no statistical difference was found between handling characteristics of orange oil and chloroform. Since this survey is opinion based study dependent on the personal experience of the dentist this can be concluded that the detrimental effects of chloroform is known to majority, the awareness regarding substitute to synthetic solvents need to be spread more as the result shows 19.3% knew about natural solvents and 2.1% did not had any knowledge of the solvents available. Hence it can be concluded that knowledge of re-treatment and various gutta percha solvents is matter of further investigation and wise decision should be made while selecting the solvents keeping in consideration the scientific clinical properties and experienced based clinical performance properties to maximize the desired outcome.

Bibliography

1. Vertucci FJ. "Root canal anatomy of the human permanent teeth". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 58 (1984): 589-599.

2. Frank J Vertucci. "Root canal morphology and its relationship to endodontic procedures". *Endodontic Topics* 10 (2005): 3-29.
3. Mattison GD, *et al.* "Effect of post preparation on the apical seal". *Journal of Prosthetic Dentistry* 51 (1984): 785-789.
4. Mark N McDonald and Donald E Vire. "Chloroform in the Endodontic Operatory". 18.6 (1992).

Volume 3 Issue 6 June 2019

© All rights are reserved by Rahul Maria, *et al.*