Assessment of Knowledge attitude and practice about sodium hypochlorite accident among post graduate dental students in Chennai

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Abstract

INTRODUCTION: While sodium hypochlorite (NaOCl) is known to be the most efficient, inexpensive and readily available agent for root canal irrigation due to its tissue-dissolving, antibacterial and lubrication properties, it is poisonous to essential tissues and is capable of corroding metals, and clothing damage and severe eye, skin, or oral mucosa may be induced by unintentional spillage.
MATERIALS AND METHODS: Self-administered questionnaire was designed On the topic "Assessment of Knowledge attitude and practise about sodium hypochlorite accident among pg "The questionnaire was distributed through a google forms link. The study population also included 137 post graduate dental students
Results:70.8% of participants were aware that sodium hypochlorite is toxic to vital tissue structures but 29.2% of participants were not aware.51.1% of participants think that side vented needles prevent sodium hypochlorite accident whereas 48.9%of of participants disagree
Conclusion: The present study concludes that there is a moderate knowledge on practise about sodium hypochlorite accident among postgraduate dental students

Keywords: sodium hypochlorite; hypochlorite accident; KAP Survey, innovation technology, eco friendly
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INTRODUCTION

While sodium hypochlorite (NaOCl) is known to be the most efficient, inexpensive and readily available agent for root canal irrigation due to its tissue-dissolving, antibacterial and lubrication properties, it is poisonous to essential tissues and is capable of corroding metals, and clothing damage and severe eye, skin, or oral mucosa may be induced by unintentional spillage(Baumgartner and Cuenin, 1992) Some endodontists agree that the deep application of the irrigation solution to root canals results in a more efficient elimination of debris(Zehnder, 2006),But the downside of this form of delivery could be increased apical extrusion(3)(Zehnder, 2006)(Bjørndal, Kirkevang and Whitworth, 2018)(Basrani, 2015). Root canal irrigation plays a vital function in the debridement and disinfection of the root canal system, and is an essential part of the root canal preparation process(Farook *et al.*, 2014)(Baumgartner and Cuenin, 1992). Root canal irrigation plays a vital function in the debridement and disinfection of the root canal system and is an essential part of the root canal preparation process(Basrani, 2015).The most often employed irrigants are sodium hypochlorite and hydrogen peroxide or the mixed useg of both(Boutsioukis, Psimma and van der Sluis, 2013). Their advantages, strong tissue dissolving and disinfecting capabilities have been shown in a number of investigations(Clarkson and Moule, 1998) NaOCl happens where this irrigation solution is extravagant above the apex, leading to tissue necrosis. This is manifested as intense discomfort, burning, accelerated tissue swelling, and periapical tissue bleeding(Fuks and Peretz, 2016)(Casson, 2019).

Inadvertent injection of sodium hypochlorite beyond apical foramen may occur in teeth with large apical foramen or where apical constriction has been destroyed during root canal preparation or resorption(Fuks and Peretz, 2016; Patel and Barnes, 2019)(Intratec Solutions, 2013). Add-alloy, excessive pressure during irrigation or binding of the irrigation needle tip to the root canal without release for the irrigation to leave the root canal coronally can result in contact of large amounts of irrigation with the apical tissues(Becker, Cohen and Borer, 1974) If this happens, an outstanding tissue-dissolving capab-sodium hypochlorite disease can lead to tissue necrosis(Reeh and Messer, 1989)(Rotblatt and Ziment, 2002).Our team has extensive knowledge and research experience that has translate into high quality publications(Sathivel *et al.*, 2008; Panda *et al.*, 2014; Govindaraju, Neelakantan and Gutmann, 2017; Johnson *et al.*, 2020; Saraswathi *et al.*, 2020) (Kumar *et al.*, 2006; Devi and Gnanavel, 2014; Varghese *et al.*, 2015; Sivamurthy and Sundari, 2016; Chen *et al.*, 2019).This study aims to evaluate the

knowledge, attitude and practice of post graduate dental students in Chennai towards sodium hypochlorite accidents.

MATERIALS AND METHODS:

Study design

A cross sectional study was conducted through an online survey among dental students and other dental specialities of private dental institutions, Chennai.

Inclusion criteria

Undergraduate dental students of private dental institutions who were willing to participate were included.

Ethical consideration

Returning the filled questionnaire was considered as implicit consent with no need for signing a written consent. Ethical approval for the study is obtained from the institutional review board (IRB).

Study method

Self-administered questionnaire as designed On the topic "Assessment of Knowledge attitude and awareness awareness about sodium hypochlorite accident among pg" The questionnaire was distributed through a google forms link. The study population also included 137 post graduate dental students. The sample size was calculated a priori keeping the confidence interval 95%. The participants were explained about the purpose of the study in detail .The questions were carefully studied and the corresponding answers were marked by the participants. Demographic details were also included in the questionnaire. The collected data was checked regularly for clarity, competence, consistency, accuracy and validity.

RESULTS:

S.No	Questions	Choices	Responses
1	Are you aware that sodium hypochlorite is toxic to vital tissue structures ?	Yes No	70.8% 29.2%
2	Are you aware of sodium hypochlorite accident management ?	Yes No	65% 35%
3	If yes , do you think which of the following is a good method for management ?	Surgical debridement Antibiotic and anti inflammatory medicine Medical referral All the above	19.7% 46.7% 10.2% 23.4%
4	Do you think rubber dams will prevent sodium hypochlorite accidents ?	Yes No	46.7% 53.3%
5	Do you think side vented needles can prevent sodium hypochlorite accidents ?	Yes No	51.1% 48.9%
6	Do you think sodium hypochlorite accidents are common ?	Yes No	43.1% 56.9%
7	Do you think dentists will panic when a sodium hypochlorite accident occurs ?	Yes No	62% 38%
8	Are you aware that sodium hypochlorite causes damage to skin ?	Yes No	42.3% 57.7%
9	Are you aware that sodium hypochlorite causes damage to oral mucosa ?	Yes No	70.1% 29.9%

10	Are you aware that sodium hypochlorite causes eye damage?	Yes No	36.5% 63.5%
11	What are the clinical symptoms of sodium hypochlorite accidents ?	Excessive bleeding from canal Swelling Ecchymosis Nerve paresthesia All of the above	28.5% 4.1% 0.9% 21.2% 45.3%
12	Have you ever faced a sodium hypochlorite accident in clinical practise?	Yes No	34.6% 65.4%
13	If yes, which tooth have you faced?	Maxillary anterior Maxillary Posterior Mandibular anterior Mandibular posterior	20.7% 26.8% 17.1% 35.4%
14	Concentration of sodium hypochlorite preferred by you (%)?	0.5 1.5 2.0 2.5 3 5.25 6	12.8% 24.8% 7.6% 4.4% 28% 9.6% 12.8%
15	Time and volume of irrigants you use ?	40 minutes 15 ML 30 minutes 10 ML 20 minutes 5ML No idea	11.9% 28.7% 17.8% 41.6%
16	What do you think will prevent sodium hypochlorite accidents to the maximum?	Side vented needles Hypochlorite concentration Rubber dam isolation Avoid binding syringe All of the above	5% % 16.8% 21.5% 50.5%

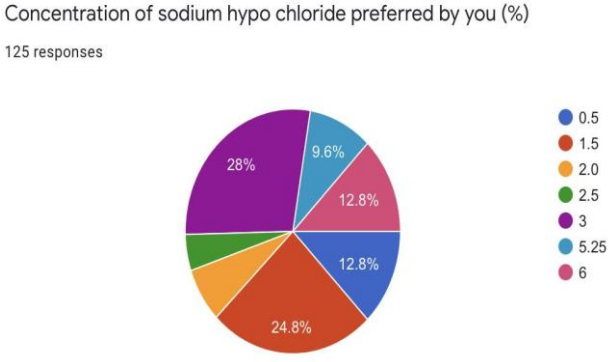

Fig 1 depicted the frequency of concentration of sodium hypo chloride preferences were 28% preferred 3% followed by 24.8% preferred 1.5 %, 12.8% preferred 6% and 0.5 % and 9.6% preferred 5.25%

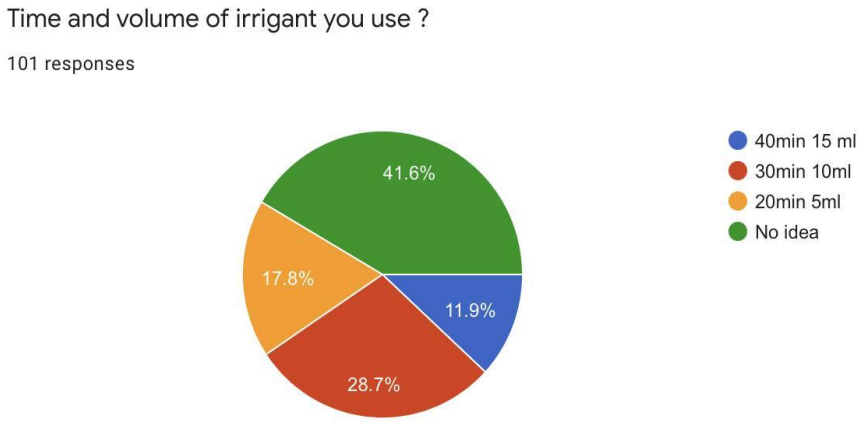

Fig 2 depicted the frequency of knowledge were 41.6% have no idea followed by 28. think 30 min 10ml ,17.8% think 20min 5ml and 11.9% think 40 min 15ml as the time and volume of irrigate used in the cavity.

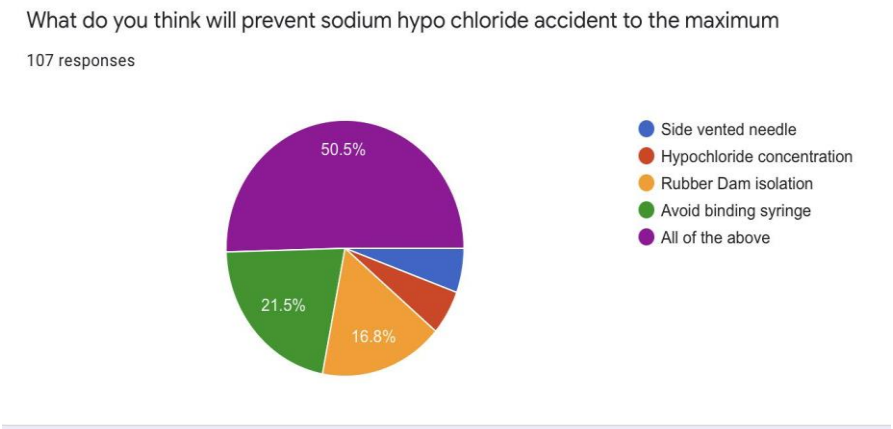

Fig 3 depicted the frequency of knowledge were 50.5% think all of above followed by 21.5% think avoiding binding syringe and 16.8% think rubber dam isolation will prevent sodium hypochlorite accident to the maximum

DISCUSSION:

In the present study 70.8% of participants were aware that sodium hypochlorite is toxic to vital tissue structures S.no 1. 65% of participants were aware about sodium hypochlorite Accident management S.No 2. 46.7% of participants think antibiotic and anti inflammatory medicine as a good method of sodium hypochlorite management S.No 3. 53.3% of participants were not aware that rubber dams will help in prevention of sodium hypochlorite accidents S.No 4. 51.1% of participants were aware that side vented needles prevent sodium hypochlorite accidents S.No 5. 43.1% of participants think sodium hypochlorite accidents are common S.No 6. 62% of participants agreed that dentists panic during an sodium hypochlorite accident S.No 7. 57.7% Of participants were not aware that sodium hypochlorite causes damage to skin S.No 8. 70.1% Of participants were aware sodium hypochlorite causes damage to oral mucosa S.No 9. 63.5% Of participants were not aware that sodium hypochlorite causes damage to eyes S.No 10. 21.2% Of participants were aware of nerve paraesthesia as the clinical symptoms of sodium hypochlorite accidents S.No 11. 34.5% have agreed that they faced sodium hypochlorite accidents in clinical practise S.No 12. 35.4% think mandibular posterior is the area where sodium hypochlorite accidents happened S.No 13. 28% of participants preferred 3% concentration of sodium hypochlorite while during procedure S.No 14. 41.6% have no idea about time and volume of irrigate used during the procedure S.No 15. 21.5% were aware that avoiding binding syringes will prevent sodium hypochlorite accidents to the maximum S.No 16.

Similar findings were found in an article by (Zarra and Lambrianidis, 2013)where the majority of participants were aware that the sodium hypochlorite is toxic to vital tissue structures. A study by (*Side Effects of Drugs Annual: A worldwide yearly survey of new data in adverse drug reactions*, 2015) has also obtained similar results where the majority of participants were aware of sodium hypochlorite accident management.
An opposing results were found in an article by (Shetty *et al.*, 2020) were majority of participants think surgical debridement as a good method for sodium hypochlorite accident management.An similar result was obtained in a study by (Guivarc'h *et al.*, 2017) were majority of the population were aware of sodium hypochlorite accident management.
In a study by (Jain, 2017) concluded that use of rubber dams will prevent sodium hypochlorite accidents.Similar findings were found in an article by (Ms and AL-Zahrani, 2016) were the majority of participants preferred 1.5% Concentration of sodium hypochlorite for irrigation.
Similar findindings were found in an article by (Al-Sebaei, Halabi and El-Hakim, 2015) were majority of the participants preferred 30 minutes and 10Ml as the time and volume of the irrigants used during treatment.Opposing findings were found in an article by (Kempler *et al.*, 1982) where the majority of participants responded that avoiding binding syringes will prevent sodium hypochlorite accidents to the maximum.

Limitations of the Study

1. The survey is based on self-reported data, and thus, subjects may under or over report about their KAP about herbal medicines.
2. The method of sampling used was simple random sampling, so the study population is unevenly divided.

CONCLUSION:

The present study concludes that there is a moderate knowledge on practise about sodium hypochlorite accident among pg. The present survey revealed that Two parameters that were evaluated in the survey was awareness and interest, which are interrelated but was found to be moderate.

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CONFLICTS OF INTEREST: None to declare

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