Knowledge and awareness survey on the management of air emphysema in dental practice

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ABSTRACT:
Objective: Air emphysema is characterised by swelling in the facial region, caused due to various dental procedures, due to penetration of air exposure in the oral cavity. Usage of paper points during root canal treatment is one of the precautionary methods in management of air emphysema.The objective of the study is to analyse the knowledge and awareness on management of air emphysema in dental practice. **Materials and Methods:** A questionnaire based survey was conducted among dental students of Saveetha Dental College, Chennai.There were about 100 participants, both from UG as well as PG. It had various questions related to the research, it was an online based survey. **Discussion:** Majority of the population in our study were aware of management of air emphysema during various dental procedures. P value is 0.005 which is considered to be significant. **Conclusion:** The results of the present study conclude that the majority of the population are aware of management of air emphysema in dental practice.
KEYWORDS: subcutaneous, emphysema, air abrasives, innovative techniques.

INTRODUCTION:

Subcutaneous air emphysema is characterised by rapid swelling especially in the facial region.It has been considered as a life threatening event [1].It occurs during various dental procedures such as extraction, and in root canal treatment. Air dissection occurs during root canal treatment, it leads to penetration of air inside the open space of the oral cavity. [2]When diagnosing air emphysema the important feature is crepitus,whereas crackling is the most significant sign. When tooth debris is introduced in tissues, an important procedure of prophylactic antibiotic therapy is recommended.[3]

It is very important for the dental practitioners to be aware of knowledge of the symptoms of subcutaneous air emphysema and methods to prevent its occurrence are essential.[4] Usage of paper points during root canal treatment is one of the precautionary methods in management of air emphysema. [5]

Usually air emphysema resolves itself without more complications, whereas sometimes it leads to more complicated problems. [5,6] It must be stressed the vital importance of the use of a paper points for drying the canal before obturation instead of a blast of compressed air from the three way syringe.Our team has extensive knowledge and research experience that has translate into high quality publications[7–16][17–21].

The aim of our present study is to analyse the knowledge and awareness among dental students as well as dental practitioners based on their management of air emphysema during dental practise.

RESULTS:

In Our study around 43.7% male , and remaining 56.3% female had responded, the study population represented the first to final year students , of which a majority of 31.9% where 1st years, 20.7% where 2nd years, 17.8 % where 3rd years , 21.5% where 4th years, and the final year students were around 8.1 % participated,(p) value is 0.00 <0.05 hence it is statistically significant. (table:1) .

From the study we understand that around 60% responders of them think root canal treatment cause air emphysema, whereas 25% believe dental operations are one of the reasons,14.1 % believe extraction is one of the causes, where in the 1st year around 28.89% responders voted for root canal treatment, (p) value is 0.00<0.05 , hence it is statistically significant.(Fig :1)

54.8% of population have knowledge of crepitus as a clinical sign, 30.4 % believe crackling as a clinical / evident sign, where 1st year around 14.81% voted for crackling and crepitus, p value is 0.002<0.05 , hence it is statistically significant., (fig:2)

Around 63% responders believe it heals on its own, whereas the remaining 37% disagree that it does not heal on its own, where in the 1st year around 24.44% voted that it heals on its own, p value is 0.171>0.05, hence it is statistically not significant. (fig: 3,5). Around 65.9% responders believe amoxicillin is a drug of choice, where remaining 20.7% believe azithromycin, 13.3 % choose paracetamol, 1st year around 23.70% voted that amoxicillin, its p value is 0.085>0.05 , hence it is statistically not significant.(Fig:4).

Around the majority of 57% responders believe that smoking is the major risk factors which is predisposing to air emphysema, remaining 24% responders believe that pollution is one of the causes , 18% responders believe that age is the one of the cause for air emphysema , its p value is 0.005<0.05, hence it is statistically significant (Fig:6).

Majority of responders around 63% responded that the surgery is one of the factor which leads to subcutaneous emphysema in root canal treatment, around 19% believe that infection as well which leads to subcutaneous emphysema, 10% of the responders responded that all of the above, that is both surgery as well as infection was one of the cause, remaining 6% responders opted for none of the above., its p value is 0.063>0.05, hence it is statistically not significant. (Fig:7).

DISCUSSION:

According to variety of case reports within the literature, dentistry treatment, surgical extractions, restorative medical care, crown preparations and also the use of air abrasion have

caused body covering emphysemas.5–10 Patients appear to be a lot of in danger if there's preexistent disease.10 additionally to induced causes, body covering emphysemas also can be patient-induced. This generally happens once associate extraction in things during which the patient begins to smoke, cough, exhale forcefully or vomit before any healing has taken place, within the case of dentistry treatment, bleaching agent accidents, the employment of air-driven syringes, and misuse of rubber dams — or not employing a rubber dam — are documented as inflicting body covering emphysemas.[22–24]

In earlier studies conducted by Raoul et al, had mentioned that Crepitus on palpation is pathognomonic and an important diagnostic feature in excluding differential diagnoses or acute swelling, similarly in our studies around 54.81% responders agreed that crepitus is an evident clinical sign, which shows similar findings.[6] L. Mishra in her studies have mentioned that two procedures in endodontics , if carried out improper then it has potential to cause a problems , during apical surgery and canal preparation, similarly in our studies we have a correlation of our studies that around 60% responders have been mentioned that air emphysema is caused during root canal procedures.[6,25]

In one case involving a 16-year-old girl, the patient's recovery was uneventful without antibiotics, even in the presence of pneumomediastinum . This difference in treatment modality may be based on severity and the patients' general condition is discussed by Sung Tak Lee, et al [26] in his article, similarly in our studies majority of the responders have chosen amoxicillin as a prescribed medicine.

LIMITATIONS: Study size , the population is less as it has been conducted among one dental college, therefore in further study need to be conducted among a large population by involving various other dental colleges.

FUTURE SCOPE: Using the study we can further access the knowledge about management of air emphysema among dental students and create an appropriate study set up and clinical guidelines during practical sessions.

Table:1. **Socio Demographic Data**

Gender	male Female	43.7% 56.3%
Year of study	1st year 2nd year 3rd year 4th year Final year	31.9% 20.7% 17.8% 21.5% 8.1%

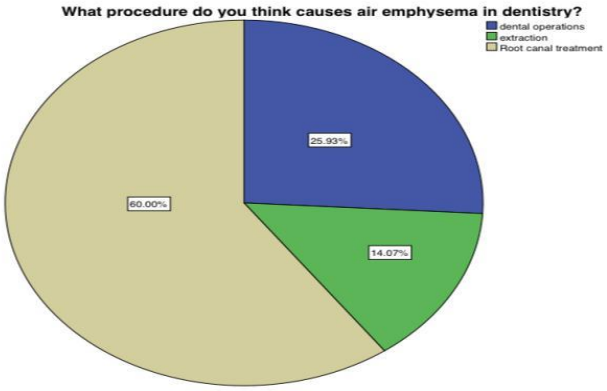

Figure: 1 . This pie chart represents the percentage of responders who have answered the cause of air emphysema, beige colour indicates root canal treatment (60%), blue colour indicates dental operations (25.93%), green colour indicates extraction (14.07%) are the causes of air emphysema in dentistry.

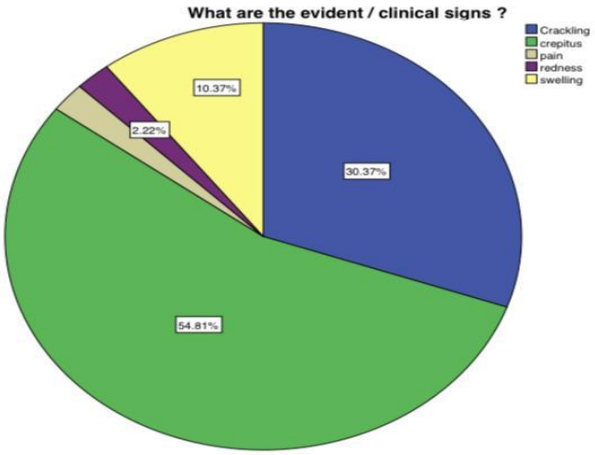

Figure:2 This pie chart represents the percentage of responders who have answered the clinical signs such as green colour represents crepitus (54.81%) ,blue colour represents crackling (30.37%) , yellow colour represents swelling (10.37%), violet colour represents redness (2.22%), beige colour represents pain as a clinical sign of air emphysema.

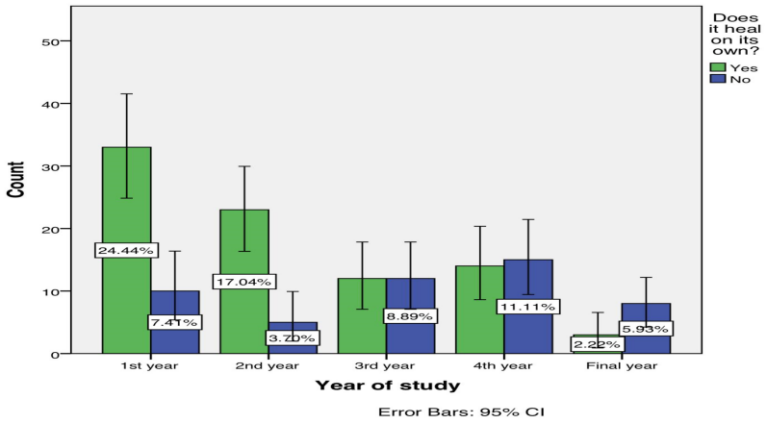

Figure: 3 . This bar graph represents the association between year of study and the healing process of air emphysema. (P) value : 0.171>0.05, hence it is statistically not significant. Green colour indicates yes and blue colour indicates no.

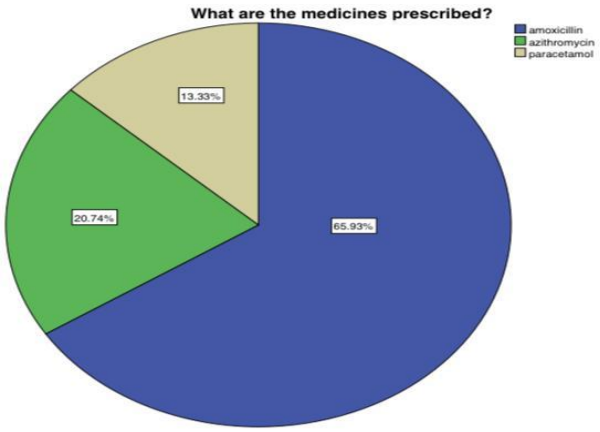

Figure:4 . This pie chart represents the percentage of responders who have responded , amoxicillin (65.93%) blue colour, azithromycin (20.74%) green colour and beige colour indicates paracetamol (13.33%), as the prescribed medicine.

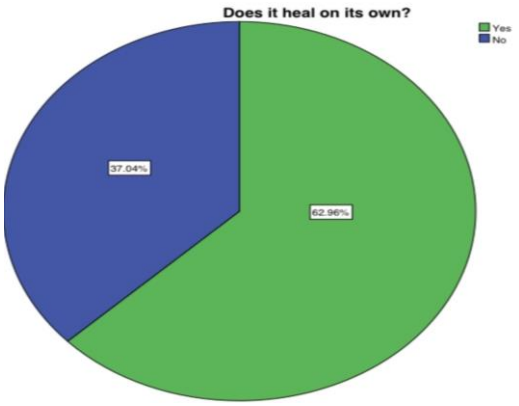

Figure:5 . The pie chart represents the percentage of responders who have responded , green colour, in which around 63% believe that the air emphysema heals on its own, whereas the remaining 37% responders believe that air emphysema doesn’t heal on its own.

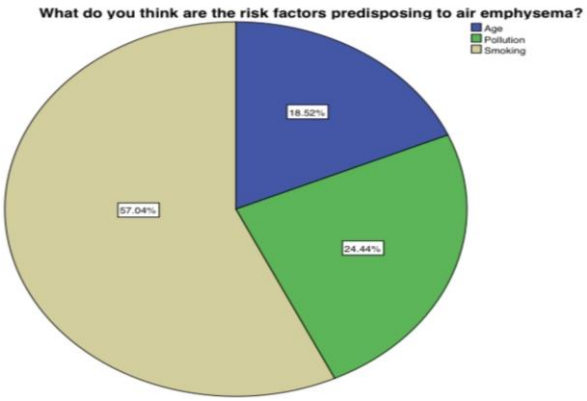

Figure:6 This pie chart represents the percentage of responders who have answered that the risk factors predisposing to air emphysema such as green colour represents pollution (24.44%) ,blue colour represents age(18.52) , beige colour represents smoking (57.04%).

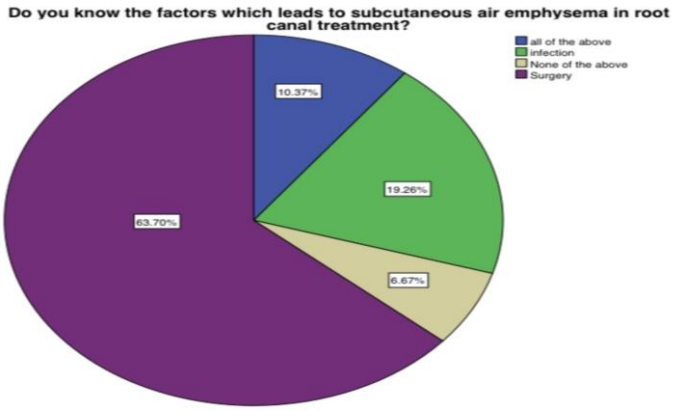

Figure:7 This pie chart represents the percentage of responders who have answered that the factors which leads to air emphysema in root canal treatment such as green colour represents infection (19.26%),violet colour represents surgery (63.7%)beige colour represents none of the above (6.67%),whereas blue colour represents all of the above (10.37%).

CONCLUSION:

The results of the present study would conclude that the majority of the population are aware of management of air emphysema in dental practice. Among 1st year, 2nd year, 3rd year, 4th year and final year . Among them, 4th year students tend to have more knowledge and awareness compared to other year students . Further studies with more population needed to assess the knowledge and awareness on management of air emphysema. Still more awareness can be created among the selected population by conducting various practical sections to enhance their knowledge in this topic.

Authors contribution:

Sheefaa. M.I- Contributed to conception, design, data acquisition and interpretation, drafted and critically revised the manuscript.
Dr. Vikhashini - Contributed to conception, design, and critically revised the manuscript.
All authors gave final approval and agreed to be accountable for all aspects of the work.

Conflict of interest:
The authors declare no conflict of interest.

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