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PRESIDENT'S MESSAGE



Dr. M.B. Aswath Narayanan
President
IDA Madras Branch

Dear Members,

Many practitioners think that Preventive Dentistry doesn't pay. But I may add with confidence that it is the safest way to make maximum money & provide best care for the patients. Let us see some of the procedures we can do & charge even reasonably well.

1. DENTAL CARIES

- ✦ Pit & Fissure Sealants
- ✦ Topical Fluorides
- ✦ Art
- ✦ Diet Counselling
- ✦ Correction of Causations - Baby Bottle/Malocclusion/Snacking

2. PERIODONTAL DISEASE

- ✦ Nutrition
- ✦ Awareness - Explain Brushing Techniques
- ✦ Oral Prophylaxis - Causative Factors

3. MALOCCLUSION

- ✦ Genetic Counseling
- ✦ Habits
- ✦ Serial Extraction
- ✦ Functional Appliances
- ✦ Essentiality of Extractions
- ✦ Space Maintainers

4. ORAL CANCER

- ✦ Take Time to Talk to The Patient
- ✦ Saving One Life is Adequate
- ✦ Refer
- ✦ Motivate to Quit Causes
- ✦ Cytobrush Biopsy

5. TMJ DISORDERS

- ✦ Acclimatise the Medical Personnel
- ✦ Create Awareness of Treatment Modalities

6. DENTAL FLUOROSIS

- ✦ Causative Factors
- ✦ Create Awareness of Treatment Modalities

The Ultimate Aim of the Medical Profession Must be to Eliminate the Need for It's Own Existence. Earn by Preventing.



Dr. M.B. Aswath Narayanan

SECRETARY'S MESSAGE



Dr. H. Thamizhchelvan
Hon. Branch Secretary
IDA - Madras Branch

As G.V.Black says, " The professional man has no right to be other than a continuous student",the process of learning never comes to an end even after obtaining a degree or post graduation for any practitioner. The journals provide a platform for acquiring and sharing knowledge and improving the quality of the treatment.

The journal of Indian Dental Association aims at providing original research articles, case discussions & quality reviews. This Journal is a peer reviewed scientific journal for clinical practitioners. I am happy & proud to be a part of this journal. A lot of effort has been put by the team of editorial,reviewers&authors for the success of this journal. I take this oppurtunity to congratulate the team and I am highly optimistic that the same enthusiasm continues to take the association to greater heights in the future.

Wishing you all a great time ahead

With regards

A handwritten signature in blue ink, appearing to read 'H. Thamizhchelvan'.

Dr. H. Thamizhchelvan

LETTER FROM THE EDITOR



Dr. C.K. Dilip Kumar
Editor-in-Chief
IDA - Madras Branch

With lots of interesting manuscripts this year (2016), I hope the same support will be rendered by the students, academicians & clinicians too take our association's

e-Journal to the next level. I sincerely thank my team, my mentors & seniors in the association, authors, reviewers, advertisers, printers and others for making our team to publish all the four issues this year in a successful way.

We witnessed an exciting year of educational, cultural, sports and service activities by the association with the help of their respective committees. Our team would like to congratulate the entire team lead by our honorable President and Secretary for the successful year and would also like to wish them luck for the upcoming year with more glory to the association

A handwritten signature in blue ink, appearing to read 'Dr. C.K. Dilip Kumar'.

Dr. C.K. Dilip Kumar

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Canine index in establishing Sex Identity - A Study among the Chennai Population

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Abstract

Human teeth being the hardest, durable and most stable form an exemplary material for anthropological, odontological and forensic investigations. Teeth are well preserved even after death. A major outbreak in the forensics of humans is the identification of sex/gender of the individual. This can be determined anthropometric evaluation. Teeth are readily accessible and do not need special dissection and hence form valuable elements in forensic investigations. There exists sexual dimorphism in the canine width and intercanine distance of mandibular canines. These teeth also exhibit greatest difference in the age of eruption than other teeth. Identification of sex precedes age as this would eliminate the missing/involved persons of one sex.

Key Words: Canine, Index, Sex determination.

Introduction

Teeth are excellent materials in living and non-living persons and have least turnover rate. Their ability to survive fire and bacterial decomposition makes them an invaluable tool of forensic odontologists.^{1,2} Sexual dimorphisms refer to the distinctive differences in size or appearance between the sexes of an animal in addition to the sexual organs themselves. Identification/determination of sex using odontometric investigations is simple and the specimens can be obtained without much difficulty.³ Mandibular canines having a mean age of eruption of 10.87 years, have

- Relatively low incidence of caries
- Least exposed to plaque/calculus
- Less subjected to heavy occlusal loads
- Least affected by periodontal disease
- Last teeth to be extracted
- Survive calamities like air disasters and hurricanes^{4,5}

These factors made the mandibular canines considered as the "key teeth for personal identification" by forensic odontologists.^{5,6} Studies performed on the lower canines using the ratio between the maximum crown width & inter-canine width, resulting in a mandibular canine index (MCI), have shown an ability to determine gender with an accuracy of 84.3% in males & 87.5% in females & 83.3% in males & 81% in females by comparing the observed MCI with a standard MCI value respectively.^{7,8} The purpose of this study is to investigate the accuracy with which gender can be differentiated by using the mandibular canine index.

Materials and Methods

Study Type: Cross Sectional Study

Selection Criteria:

120 adult healthy human volunteers will be participating in this Cross-sectional study.

120 subjects, 60 males and 60 females in the age group of 17 - 23 years who are willing to participate will be selected. This age group was selected, as attrition is minimal in this age group.

Inclusion Criteria

Subjects with the following status of tooth will be included in the study (adopted from Aggarwal et al)

- Healthy state of Gingiva and Periodontium
- Caries free tooth
- Normal over jet and over bite
- Absence of spacing in the anterior teeth
- Normal molar and canine relationship.

Measurements:

All measurements will be made in a clean and well illuminated room taking all the aseptic precautions. All measurements will be made by two examiners and the mean values will be taken for further analysis.

The following measurements will be taken for each subject

- Mesio distal width of right maxillary canine
- Mesio distal width of left maxillary canine
- Intercanine distance

From the measured values, the following values will be calculated for each subject

- Right mandibular canine index
- Left mandibular canine index
- Sexual dimorphism

Measurement of mesio-distal width

The procedure was performed as suggested by Hunter and Priest⁹. The mesial and distal surfaces of the teeth will be identified and the distance between the crest of curvature on the mesial surface and crest of curvature on the distal surface will be recorded by the divider points. The divider will then be held against the Vernier caliper and read.

Measurement of the Inter-canine Distance

The inter-canine distance will be measured between the tips of the mandibular canines. The divider points

will be applied to the tips of the mandibular canines. The divider will then be held against the Vernier caliper and the reading will be noted.

Mandibular Canine Index

It will be calculated by dividing the mesiodistal width of the canine by the intercanine distance. All measurements will be recorded in a tabulated manner and statistically analyzed. Standard deviation, variance and z values will be calculated for each parameter.

Sexual dimorphism

Sexual dimorphism will be calculated according to the formula given by Garn et al (10) as follows:

Sexual Dimorphism in mesiodistal width = $\left[\frac{X_m}{X_f} - 1 \right] \times 100$; where X_m is mean mesiodistal width in males and X_f is mean mesiodistal width in females.

Statistical analysis

The data was analyzed using an **independent sample "t" test** and the results were tabulated.

Variables	Males		Females		P value	Significance
	Mean	SD (+/-)	Mean	SD (+/-)		
Right Canine Index	0.28	0.010	0.25	0.25	0.006	Highly significant
Left Canine Index	0.28	0.008	0.25	0.008	0.009	Highly significant

Results

The following parameters were determined in males and females:

- Right mandibular canine width
- Left mandibular canine width
- Intercanine distance
- Right mandibular canine index
- Left mandibular canine index

From the above table it is evident that there is statistically significant difference between the right mandibular canine index and left mandibular canine index in males and females. There was no difference in the canine index amongst males and females separately but there was highly significant difference when the both were compared.

This method is found to be useful in predicting the sex in a South Indian population to an extent of % when compared with the standard findings of Rao et al⁷ and Muller et al¹¹.

Discussion

Mandibular canine index was employed in many studies on large populations as it is simple, significant & reliable, inexpensive and easy to perform. This is

significant as tooth morphology is influenced by cultural, environmental and social factors.¹²

Hashim & Murshid (1993) conducted a study on Saudi males and females in the age group of 13-20 years and found that only canines in both the jaws exhibited significant sexual difference amongst all the other teeth.¹³

Kaushal et al found a statistically significant dimorphism in mandibular canines. In their study on 60 subjects where the mandibular left canine exhibited greater dimorphism than those on the right.³

According to the results of Gran & Lewis and Lysell & Myrberg of 6.4% and 5.7% respectively, mandibular canines exhibit greatest sexual dimorphism. Gabriel stated that any measurement of teeth accompanied by age, race & sex should be treated with great reserve.^{14,15}

The current study similar to the above studies establishes a statistically significant sexual dimorphism in the mandibular canines and elicits that the mandibular canine index is a useful parameter in the determination of sexes.

The appreciable difference between canines in determining the sex is due to the influence of Y chromosome which is responsible for the thickness of dentine but the effect of which is not uniform on all the teeth. Whereas the X chromosome is considered responsible for the thickness of enamel and its influence was uniform on all the teeth.^{16,17} both X and Y chromosomal involvement was found by various workers.^{18,19,20}

Teeth form excellent materials to study the relationship between ontogeny and phylogeny.²¹ As stated by Eimerl & De Vore (1965), in the evolution of primates, the canines are not functionally masticatory but are coincidental with the threat of aggression and actual aggression. The transfer of this aggressive function from the teeth to the fingers occurred in humans and until this transfer, survival was primarily dependent on canines, especially in males.^{3,21}

Other factors which have been found to have some bearing on tooth size resulting in morphometric differences between males and females are environmental factors and eating habits.^{12,22,23,24}

The present study establishes a statistically significant sexual dimorphism in mandibular canines. Determination of gender based on the mandibular canine width is an inexpensive, relatively quick and easy method and could be assessed in cases of fragmented jaws and dental remains.

There might be differences in measurements of certain subjects which might be due to variations in geographical area where the subject was born.

Conclusion

In forensic medicine, dental evidence is valuable in identification of individuals, especially after mass disasters.

The standard mandibular canine index is a quick and easy method. Since the accuracy of prediction has never exceeded 84-87%, conformation can be done by using more reliable methods like DNA analysis. The standard canine index can be employed to arrive at a primitive distinction between the sexes which could be substantiated or confirmed with other time consuming methods.

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A Study on the Awareness of Tobacco Cessation Services and Efforts to Quit Smoking among the Urban Males in an Urban Locality

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Abstract

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Aim of the study: To study the awareness about tobacco cessation services, and attempts to quit smoking in young urban males. Method of Study: 60 subjects were selected from urban population for the study with age group ranging from 15 to 40 yrs. Results: A total of 8 subjects were aware and 12 subjects were not aware in the age group of 15 to 20 yrs, 10 each were aware and not aware of the services in the age group of 21 to 30 yrs, and in the age group of 31 to 40 yrs there were 14 who were aware and 6 who were not aware. Results of attempting to quit the habit of smoking once was 10, 11, and 13 in the age group of 15 – 20, 21 – 30, and 31 – 40 respectively constituting a total of 34 people. Subjects trying to quit the habit more than two times were 1, 2, 1 in the age group of 15 – 20, 21 – 30, and 31 – 40 respectively, constituting a total of 4 people. Conclusion: Tobacco usage as smoking form is more prevalent in male and awareness about tobacco cessation services needs to be emphasized in the community.

Key Words: Tobacco cessation service, Quitting tobacco, Motivation.

Introduction

Tobacco cessation is essential to reduce mortality and morbidity related to tobacco use. It has been projected that by 2050, if the focus is only on prevention of initiation and not cessation, the result will be an additional 160 million deaths among smokers. Tobacco cessation interventions are clinically effective and cost-effective, relative to other commonly used disease prevention interventions and medical treatments. Cost effectiveness analyses have shown that smoking cessation treatment compares favourably with routine medical interventions. Tobacco cessation will provide the most immediate benefits of tobacco control and maximize the advantage in quitting the habit. It is also established that a majority of smokers (>70%) desire to quit, but only 30% actually try each year and only 3-5% actually succeed in quitting.¹

World Health Organisation initiated Tobacco cessation clinics project in developing countries including India. These clinics started functioning in 13 centres across India on the 31st of May, 2002 on World No Tobacco Day. Understanding the importance of tobacco control in India, the Union government took first concrete step to Tobacco control by passing the first tobacco control act at the national level named The Cigarettes and Other Tobacco Products Act (COTPA) in the year 2003 was passed by Govt of India.²

Influencing behaviours to change them in a manner that reduces risks is a necessary step to promote health in smokers who want to quit the tobacco use. A number of influential models of behaviour change have been proposed and evaluated. These models provide a framework to show how behaviours can be changed to achieve better health and social practices.³

Based on current trends, some 30-40% of the 2.3 billion children and teenagers in the world would become

smokers in early adult life.⁴ Health behaviour change is a complex process and is guided by various empirical constructs and theories.⁵ The three modalities used in tobacco cessation clinics are Behavioural intervention, Pharmacotherapy – Nicotine replacement therapy and Other Pharmacotherapy – Bupropion hydrochloride and Varenicline tartrate.⁶

The aim of the present study was to elicit the young males in urban population's awareness of tobacco cessation services and their attempts at quitting smoking in Pammal locality.

Materials and Methods

Sixty urban subjects (young males) in 15-40 age group were selected from various localities of Pammal, Pallavaram in Tamil Nadu state for the study. Population group belonged to middle and low income groups. They were divided into 3 age groups namely: - 15 to 20 yrs, 21 to 30 yrs, and 31 to 40 yrs respectively. Details regarding the awareness of tobacco cessation services and quitting smoking among youth males in urban population were collected by providing questionnaire to the subjects. Questionnaire was distributed among the age group of 15 – 40 yrs which included the type of tobacco (smoking) used were recorded. To know at which age they started smoking the ages where given the options so that the duration of the smoking habit can be assessed. To know the severity or level of addiction, questions related to how many packs of smoking form of tobacco is used by the subjects was recorded. To know the history of acquiring this habit of smoking like how they developed this habit, the number of people (friends or family members) around them with smoking habit was recorded. The reasons for why they have decided to quit the habit of smoking, was recorded by giving options which suits them like health, money, family, time, smells bad, to be smoke free, social acceptability.

To assess for how long the subjects were able to stop smoking habit, questions regarding attempting to quit the habit like once or twice if they have tired and how many of them were able to quit the habit on their self-decision and those subjects who have not attempted to quit the smoking habit, the duration of time they were able to maintain complete abstinence like for how many weeks or months and if it had occurred then the time period was also recorded. To assess the techniques which helped them quitting the habit - exercise, self-motivation and change in habits, patch, gum, hypnosis, acupuncture, counselling and medicine was also asked from the subjects. To know the changes that the subject wants to bring about for tobacco free life like personal habit changes, life style, diet and exercise were also noted. To record who will help them in leading a tobacco free life like family, spouse, friend or everybody and to assess the level of relapse, the main features like self-determination, to be smoke free, support, attitude change, and stress relievers were recorded. The fears in quitting process like mood changes, weight gain, loss of control, poor self-esteem, failure, tense and the major stressors which made them smoke - work, family, money, school, own health, time, relationship, family's health and any method to overcome them like hobbies, sleep, drink, relaxation, prayer, music etc. were recorded. To know the awareness of availability of tobacco cessation services among the subjects questionnaire also included whether they are aware about the service available and if they under gone any treatment. Finally the awareness of tobacco cessation services and quitting smoking among youth males in urban population was studied.

Questionnaire

- Name (Optional) -
- Age / Sex - Education -
- Occupation - Income -
- Which of the following do you use: (Check all that apply)
- Cigarettes Cigars Pipe Chew Snuff Other
- How old were you when you first used tobacco? (Check one box)
- 0-12 13-14 15-18 19-22 23-30 31-40
- How many packs per day do you currently smoke? (Check one box)
- 0-½ ½-1 1-1½ 2-3 3+ < 10 cigarettes a week
- How many people are living with you that use tobacco?
- 0 1 2 3 or more
- Does your spouse/significant other use tobacco?
- Yes No Not Applicable
- Why do you want to quit? (Check all that apply)
- Health Money Family Time Smells Bad
- To Be Smoke-Free Social Acceptability Other
- What is the longest time that you have gone without using tobacco? (Check one box)
- 0-1 week 2-3 weeks 1-6 months 7-11 months
- 1-3 years 4-6 years 6+ years
- When did this occur? (Month, Year, etc.) From _____ To _____
- How many times have you tried to quit in the past?
- Once >2 times
- What worked for you in the past? What helped you with your success?
- Exercise Self-Motivation Change in Habits Patch Gum
- Nothing Don't Know Hypnosis Acupuncture
- Individual Counseling Group Counseling Medicine

- Not Applicable Other:
- What are you willing to change to become tobacco-free?
- Anything Personal Habits Lifestyle Diet
- Exercise routine

Results

The awareness of tobacco cessation services available was studied and the results showed that 8 subjects were aware and 12 were not aware of the cessation services in the age group of 15 to 20 yrs, 10 subjects each were aware and not aware of the cessation services in the age group of 21 to 30 yrs, and in the age group of 31 to 40 yrs there were 14 subjects who were aware and 6 subjects who were not aware as shown in Table 1, Graph 1.

Survey also included questions to assess peoples motivation towards quitting of usage of tobacco products (smoking form) which shows results of attempting to quit tobacco use. Subjects who tried to quit the habit once was 10, 11, and 13 in the age group of 15 - 20, 21 - 30, and 31 - 40 respectively constituting a total of 34 people as shown in Table 2, Graph 2.

Subjects attempting to quit the habit for more than two times were 1, 2, 1 in the age group of 15 - 20, 21 - 30, and 31 - 40 respectively, constituting a total of 4 people as shown in Table 2, Graph 2.

Subjects who have quit the tobacco use were 7, 6, 4 in the age group of 15 - 20, 21 - 30, and 31 - 40 yrs respectively constituting a total of 17 people as shown in Table 2, Graph 2.

Subjects who have not attempted to quit the tobacco use were 2, 1, 2 in the age group of 15 - 20, 21 - 30, and 31 - 40 respectively constituting a total of 5 people as shown in Table 2, Graph 2.

Table 1 - Awareness of Tobacco Cessations Services Available

AGE GROUP	YES	NO
15 - 20	8	12
21 - 30	10	10
31 - 40	14	6
TOTAL	32	28

Graph1 - Awareness of Tobacco Cessations Services Available

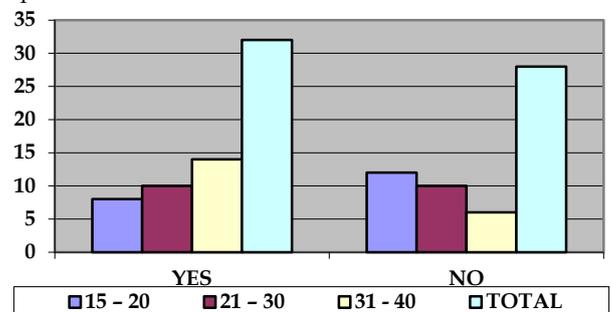
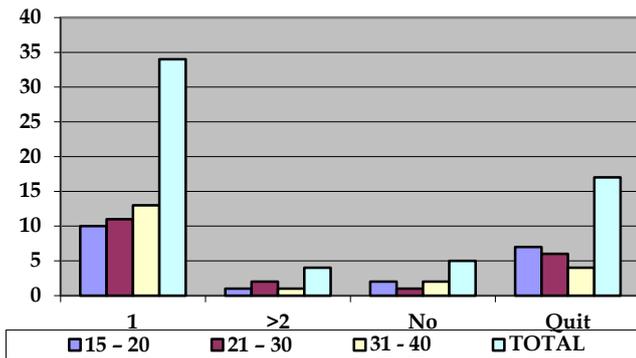


Table 2 - Attempts to Quit Smoking among Youth Males

AGE GROUP	ONE TIME	> TWO TIME	NO ATTEMPT	QUITTED
15 - 20	10	1	2	7
21 - 30	11	2	1	6
31 - 40	13	1	2	4

TOTAL	34	4	5	17
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Graph 2 - Attempts to Quit Smoking among Youth Males



Discussion

Tobacco usage predominantly in the form of smoking cigarettes is strongly correlated with several adverse health consequences. Main cause of high mortality in the most of the countries are due to cancer especially lung cancer, cardiovascular disease and chronic obstructive pulmonary disease. So if smoking is causing these complications or diseases then quitting this adverse habit will ameliorate it and there is growing evidence that various cessation protocols especially for tobacco is available in various treatment strategies. Systematic review of randomised control trials shows that the most effective way in the improving the smoking cessation protocol is by a simple advice from the doctor to stop smoking. This is a comparatively easy method to accomplish and takes a little time in our practice. ⁷ So the study was conducted among 60 young males in urban subjects to assess the amount of awareness about tobacco cessation services and attempts in quitting smoking in the given population. Subjects were divided into 3 age groups of 15 - 20 yrs, 21 - 30 yrs, and 31 - 40 yrs. The subjects belonged to middle and low income groups. The awareness of the tobacco cessation services that are available for the community was high in the age group of 31 to 40 yrs followed by considerable response from subjects in the age group of 21 - 30 yrs.

The response regarding the awareness of the tobacco cessation services available from the age group of 15 - 20 yrs showed that the awareness of cessation services needs to be spread thorough campaigns, lectures and also the ill effects of tobacco use both on health and economic status of an individual needs to be emphasized so that these tobacco use habits can be controlled at the initial stages (Table 1, Graph 1). Ramesh Kumar et al (2011) showed that the prevalence of tobacco usage was more and the awareness of harmful effects of tobacco was less. The study emphasized on carrying out immediate and quick measures in creating awareness at the school level targeting the young people so that they will well

educated about the health hazards due to usage of tobacco products and also can educate the peers and family member about this deleterious products. ⁸ Gboyega E. Abikoye et al (2013) study showed that young people are influenced by peers, mass media and other influences in starting the smoking habit and such influences should be the focus in the preventive intervention of the young peoples. The study also showed that 80 % subjects admitted difficulty in quitting smoking, 72 % of subjects had unsuccessful attempts to quit smoking and 91 % of subjects realized that they would require help to quit smoking.⁹ As people try to quit the habit of tobacco use for various reasons, some attempt to do it on their own will power and succeed but some are not able to do because they lack will power and proper guidance. Our study showed that 10, 11,13 number of subjects in the age group of 15 - 20, 21 - 30 , and 31 - 40 yrs have tried once to quit the habit of smoking , 1, 2, 1 number of subjects in the age group of 15 - 20, 21 - 30, and 31 - 40 yrs have tried to quit the habit of smoking more than two times and 7, 6, 4 in the age group of 15 - 20, 21 - 30, and 31 - 40 yrs who have quit the smoking habit. Those subjects who have not attempted to quit smoking were 2, 1, 2 subjects in the age group of 15 - 20, 21 - 30, and 31 - 40 respectively. The present study also showed a higher proportion of subjects who were not able to quit tobacco successfully or lack knowledge and guidance in quitting. The results were similar to the study of Gboyega E. Abikoye et al (2013).

In order to facilitate the implementation of Tobacco control laws, to bring about greater awareness of the harmful effects of tobacco, and to fulfill the obligations under the WHO - Framework convention on Tobacco control, Govt of India has launched a new National Tobacco Control Programme in the 11th Five year plan whose main components were Public awareness/ mass media campaigns, establishment of tobacco product testing laboratories, mainstreaming the programme components as a part of the health delivery mechanism under National Rural Health Mission (NRHM) framework, mainstream research and training on alternate crops and livelihood, monitoring and evaluation, dedicated tobacco control cells, training of health and social workers, school programme and provision of tobacco cessation facilities. ¹⁰

For persons who express willingness to try and quit tobacco use are advised about changes in life style like small changes in daily routine, especially at the crucial times or situations linked to tobacco use, add exercise or yoga routine, and stop alcohol and caffeinated drinks, drink lots of water and eat plenty of fruits and vegetables.¹¹ A large majority of smokers have fear of weight gain (average of 2 - 3 kg) over the first few

months of post cessation, but many lose much weight. Physical exercise would prevent weight gain and is part of a healthy living pattern that the smoker should be encouraged to adopt.¹² Main components of the behavioral intervention that are followed in the tobacco cessation programmes are Habit analysis, craving management, withdrawal management, relapse prevention.¹³ Most of the researchers and medical professionals who expand the strategies for tobacco control and implement various awareness and prevention programme generally focus on young people as they are the risk group. But venturing in developing newer intervention techniques needs to be carried out apart from focusing on tobacco related health risks.¹⁴.

Conclusion

The present study reveals that the adult subjects had better awareness on cessation services than the younger age group which forms the future generation. The study also reveals that only smaller number of subjects were able to quit the smoking habit. Motivation towards quitting the habit of smoking was tried only once by maximum number of subjects and were not able to get rid of the habit.

Among young males smoking habit is more prevalent than chewing tobacco usage. Prevention of tobacco consumption as shown in the literature starts with educating our children and providing programs that make our children aware of the risks at an early age. A wide range of facilities can be used to emphasise the ill effects of tobacco and its ill effects among younger population groups who constitute the future generation. Awareness campaigns and motivating lectures are needed much among all levels to quit using tobacco and particularly important at the school and college level so that the first instant of tobacco usage itself can be prevented. Since the present study involved only a small sample of population a wider study including larger sample size in different localities is needed to assess the awareness on tobacco cessation services and motivation in quitting tobacco use.

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Knowledge and Attitude Regarding Biomedical Waste Management among Dental Students and Practitioners in Chennai, India: A Cross Sectional Study

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Abstract

Purpose: To assess the Knowledge and Attitude regarding Biomedical Waste Management among dental students and practitioners in a dental college in Chennai. **Materials and Methods:** This Cross Sectional study was carried out among 150 subjects including 50 interns, 50 post graduates, 50 practitioners in a dental college in Chennai. The self-administered questionnaire comprised of 10 knowledge based and 10 attitude based questions. **Results:** About 14(22.5%) interns, 28(50.9%) post graduates, 13(23.6%) practitioners answered correctly for the question related to regulation of safe transport of medical waste. Regarding question on disposal of waste sharps 17(43.6%) interns, 6(15.4%) post graduates and 16(41.1) practitioners answered correctly. Regarding the 10 aptitude based questions, all participants agreed that the biomedical waste should be segregated into different categories and should be sterilized before autoclaving. **Conclusion:** The attitude about biomedical waste management was positive among the interns, post graduates and practitioners, though the knowledge was comparatively low.

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Introduction

Waste management is all the activities and actions required to manage waste from its inception to its final disposal.¹ "Swachh Bharat Abhiyan (SBA)" meaning clean India mission is one such national campaign by Government of India under the leadership of the Prime Minister, covering 4,041 statutory cities and towns, to clean streets, roads and infrastructure of the country.²

The biomedical waste (BMW) including solid and liquid waste material generated during the process of diagnosis, treatment and immunization of human being or animals.³ This waste material could cause serious hazards to health and environment, in case of indiscriminate management.

Biomedical waste is claimed to be more hazardous than other waste as its improper management from hospitals, clinics and other facilities may pose risks to patients, health workers, waste handlers and general public. It may also lead to contamination of air, water & soil, which may affect all forms of life.⁴ In addition, if waste is not disposed properly members of community have an opportunity to collect disposable equipment and to resell these materials which may cause dangerous disease.⁵

Hence, there is always a need for proper disposal of biomedical wastes. There are certain rules for proper disposal of biomedical waste according to act of biomedical waste (management & handling) 1998.⁴ The clinical establishment (registration and regulation) Act 2010 has been enacted by the Central Government to provide for registration and regulation of all clinical establishment in the country with a view to prescribe the minimum standards or facilities.⁶ Proper handling and disposal of biomedical waste management has also been emphasized in this law for recognition / registration of establishing a clinic.⁶

With this background, this study was conducted to assess the knowledge and attitude regarding biomedical waste management among dental students and practitioners in a dental college in Chennai, Tamil Nadu.

Materials and Methods

This study was done to assess the knowledge and attitude regarding biomedical waste management among dental students and practitioners (Interns, post graduates & practitioners) in a dental college in Chennai, Tamil Nadu. Ethical clearance was granted by the Institutional review board, Ragas Dental College and Hospital, Chennai, Tamil Nadu. Informed consent was obtained from all participants who expressed their willingness to practice in this study.

A convenience sampling method was used to select the study subjects. This survey was conducted amongst total of 150 subjects including 50 interns, 50 post graduates and 50 practitioners of a dental college to understand their knowledge and attitude regarding biomedical waste management.

Every subject who participated in this study was approached individually and the questionnaire was administered. Each individual took around 15 to 20 minutes to complete the questionnaire. Only completed questions was used for analysis.

Data was collected using a closed ended questionnaire which composed of 20 questions. Among them 10 questions were designed to assess knowledge and the rest regarding the attitudes. The later was assess on a 5 point Likert scale with the former constituting of a questions with four responses, one among them being correct to be chosen from.

The collected data was entered in Microsoft excel sheet and then statistically analysed using SPSS version 20. Descriptive statistics such as percentages, frequencies were calculated. Chi square analysis was used to find

out where a statistical significance difference existed among the study groups with a level of significance at 0.05.

Results

A total of 150 subjects in the dental institution constituting of 50 interns, 50 post graduates and 50 practitioners participated in this study. Among them 14 (22.5%) interns, 28 (50.9%) post graduates, 13 (23.6%) practitioners answered correctly for the question related to regulation of safe transport of medical waste. For the question on disposal of waste sharps 17 (43.6%) of interns, 6 (15.4%) of post graduates and 16 (41.1) of staffs answered correctly. Regarding the 10 aptitude based questions, all participants agreed that the biomedical waste should be segregated into different categories and should be sterilized before autoclaving. They were also of the view that organising separate classes to upgrade the knowledge about biomedical waste management at regular basis should be done to update their knowledge regarding biomedical waste.

Table 1 shows the distribution of correct responding of the study subject regarding knowledge about Bio Medical Waste Disposal

Questions	Intern (n=50)	Practitioners (n=50)	Post graduate (n=50)	P value
Related to BMW rules	34 (35.8%)	32 (33.7%)	29 (30.5%)	NS
Related to storage of BMW	17 (36.8%)	16 (31.6%)	16 (31.6%)	NS
Related to safe transport of BMW	14 (25.5%)	13 (23.6%)	28 (50.9%)	0.002
Related to health hazards	32 (30.8%)	33 (31.7%)	39 (37.5%)	NS
Related to disposal of anatomical waste	27 (30.7%)	27 (30.7%)	34 (38.6%)	NS
Related to disposal of excess amalgam	29 (35.4%)	23 (28.0%)	30 (36.6%)	NS
Related to disposal of sharps	17 (43.6%)	16 (41.0%)	6 (15.4%)	0.021
Related to disposal of developer/fixer	10 (26.3%)	17 (44.7%)	11 (28.9%)	NS
Related to disposal of human tissue	23 (33.8%)	20 (29.4%)	25 (36.8%)	NS
Related to recap of used needles	31 (32.0%)	32 (33.0%)	34 (35.1%)	NS

Table 2 show the distribution of responses regarding the attitudes of study subjects towards biomedical waste management

Questions	Aptitude questions answered			P value	
	Intern (n=50)	Staff (n=50)	PG (n=50)		
Related to biomedical waste segregation	A	45(90.0%)	47(94.0%)	44(88.0%)	NS
	D	5(10.0%)	3(6.0%)	6(12.0%)	
Related to health care waste hazards	A	41(82.0%)	40(80.0%)	38(76.0%)	NS
	D	9(18.0%)	10(20.0%)	12(24.0%)	
Related to biomedical	A	44(88.0%)	48(96.0%)	46(92.0%)	

waste is the team	D	6(12.0%)	2(4.0%)	4(8.0%)	NS
Related to transport of biomedical waste	A	47(94.0%)	44(88.0%)	43(86.0%)	NS
	D	3(6.0%)	6(12.0%)	7(14.0%)	
Related to BMW management is extra burden	A	20(40.0%)	30(60.0%)	24(48.0%)	NS
	D	30(60.0%)	20(40.0%)	26(52.0%)	
Related to sterilization of infected waste	A	40(80.0%)	40(80.0%)	36(72.0%)	NS
	D	10(20.0%)	10(20.0%)	14(28.0%)	
Related to treatment plan for disinfection of infected water	A	45(80.0%)	45(80.0%)	45(80.0%)	NS
	D	5(20.0%)	5(20.0%)	5(20.0%)	
Related to disposal of waste in wrong bins	A	45(90.0%)	46(92.0%)	43(86.0%)	NS
	D	5(10.0%)	4(8.0%)	7(14.0%)	
Related to BMW in institutions	A	45(90.0%)	45(90.0%)	42(84.0%)	NS
	D	5(10.0%)	5(10.0%)	8(16.0%)	
Related to separate class needed for dental colleges	A	49(98.0%)	47(94.0%)	47(94.0%)	NS
	D	1(2.0%)	3(6.0%)	3(6.0%)	

A=Agree | D=Disagree

Discussion

It is the "Prime duty " of hospitals and other health care establishments in making effort for disposing the waste they produced.⁷ Recently there is an increase in the quantity of biomedical waste due to introduction of disposables, which has lead to many problems related to inappropriate recycling, unauthorized and illegal reuse. The practice of dentistry involves use of many disposals and this calls for proper segregation and disposal of biomedical waste.⁸ The hazards of waste disposal from dental practices can be divided into two main areas. First, there is wider environmental burden due to a variety of hazardous products and secondly, the more immediate risk of potentially infectious materials that can be encountered by individuals handling the waste.⁹

The Ministry of Environment and Forests, Government of India has notified the new draft Bio-Medical Waste (Management and Handling) Rules, 2011 under the Environment Protection Act, 1986 to replace the earlier Bio-medical waste(Management and Handling) Rules, 1998 and has authorized 8 categories of waste for proper disposal with colour coding bins.¹⁰ Regarding the maximum time limit for storage of biomedical waste according to national guidelines, about 131 (87.33%) admitted that they were not aware of the time limit and only 19 (12.66%) were aware of facts that it was 48 hrs. This awareness is lower than the result conducted among dental health care personnel in a dental college in Kothamangalam by Sanjeev et al.¹¹

Regarding the safe transport of medical waste, about 95 (63.33%) were not aware of proper methods. 71.33% of the student believed that risk associated with hospital waste include HIV, Hepatitis B, injuries etc. This awareness was comparatively similar to the results of the study done by Rajiv. S et al.¹²

Regarding the disposal of waste sharp only 39 (26%) were aware of fact and methods of disposal. This

awareness was comparatively low than the study conducted among dental in West Bengal.¹³

Regarding the attitude based questions, about almost 83.8% of the respondents were aware of biomedical waste management methods & express a positive attitude. This awareness was better than the result conducted among dental health care professional by Sanjeev et al.¹¹

This study results also indicated that there was an urgent need to train the dental professionals regarding the Biomedical Waste Management rules and methods.

Conclusion

This study revealed that although the attitude about biomedical waste management was high among the interns, post graduates and dental practitioners, though the knowledge levels were comparatively lower. The dental practitioners had slightly better knowledge scores than dental students. Further this study indicated that there was an urgent need for creating awareness among dentist regarding biomedical waste management. Continuing dental education programs should be conducted on regular basis for imparting awareness regarding Bio-medical waste disposal among the dental practitioners.

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Stromal Salivary Gland Neoplasms - A Review

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Abstract

Salivary gland mesenchymal tumors are rare and account for less than 5% of all salivary gland tumors. Stromal salivary gland tumors can be benign or sarcomatous. These can be further classified into tumors arising from blood and lymphatic vessels, nerves, fibrous tissue, adipose tissue, muscle and others. More than 90% of mesenchymal tumors arise in parotid gland and less than 10% involves submandibular or sublingual glands. These neoplasms of mesenchymal origin that involve or encroach on the major salivary glands are often difficult to diagnose. Since sarcomas are more aggressive or have poor prognosis, early diagnosis and treatment plan is mandatory for patient survival. This article highlights the key features of the stromal salivary gland neoplasms.

Introduction

A salivary gland is composed of glandular secretory tissue and stroma. The supporting stroma/ connective tissue of salivary gland consists of fibroblasts, macrophages, and mast cells occasionally leukocytes, adipocytes, plasma cells embedded in ground substances. Capsule of the salivary gland is derived from connective tissue; connective tissue septa from capsule divide the glands into lobes and lobules and carry the blood vessels and nerves that supply the glandular components.

Salivary gland mesenchymal tumors are rare and account for less than 5% of all salivary gland tumors. More than 90% of mesenchymal tumors arise in parotid gland and less than 10% involves submandibular or sublingual glands. The striking predominance of mesenchymal tumors in the parotid gland when compared to other salivary glands is attributed to anatomic differences; the parotid gland lacks a well-defined capsule and contains neurovascular structures.¹ Mesenchymal tumors of salivary gland can be: Benign (>90%) or Malignant mesenchymal neoplasms.

Histogenesis

The stromal salivary gland tumors focuses on two diametrically opposed hypothesis²: The First hypothesis states that sarcomas of salivary glands are derived from myoepithelial cells that are capable of multidirectional differentiation. The second hypothesis states that the sarcomas arise from pluripotential or uncommitted mesenchymal cells.

CLASSIFICATION OF STROMAL SALIVARY GLAND NEOPLASMS²

Benign Mesenchymal Neoplasm of Salivary Gland

1. Tumors of blood and lymphatic vessels:
 - Hemangioma
 - Lymphangioma
2. Tumors of peripheral nerves:
 - Neurilemoma/schwannoma
 - Neurofibroma
 - Extracranial meningioma
3. Neoplasms of fibrous tissue:
 - Nodular fasciitis

- Fibrous histiocytoma
 - Fibromatosis
 - Myxoma
4. Neoplasms of adipose tissue:
 - Lipoma
 5. Neoplasms of smooth muscle origin:
 - Angiomyoma / vascular leiomyoma
 6. Other benign mesenchymal lesions:
 - Granular cell tumor
 - Giant cell neoplasm of major salivary glands
 - Glomangioma

Malignant Mesenchymal Neoplasms of Salivary Gland

Commonest primary sarcomas

- Malignant haemangiopericytoma
- Angiosarcoma
- Malignant schwannoma
- Fibrosarcoma
- Malignant fibrous histiocytoma
- Rhabdomyosarcoma

Hemangioma

Of the various non-epithelial tumors affecting major glands, Hemangioma is one of the most common³. The vast majority of Hemangiomas arise in the parotid gland (85.1 %), and the remainder involves the submandibular gland. The diffuse distribution of minor salivary glands and the lack of distinct anatomic boundaries preclude unequivocal evidence of origin in the minor salivary gland connective tissue stroma.³ The important types are capillary (including juvenile type) and cavernous type.² Diagnostic aid includes - Special stains, Electron microscopy, and Immunohistochemical techniques. USG, MRI Study, Colour Doppler study & Dynamic CT scan are reported to give an accurate picture of the degree of vascularity.^{2,4} Though Hemangioma are rare, they can simulate other benign conditions like submandibular sialadenitis and should be kept as a differential diagnosis.⁵ Treatment options include - Compression therapy, steroid therapy, and surgical approach.

Lymphangioma

Lymphangiomas are thought to develop from sequestered remnants of lymphatic tissue that may proliferate and accumulate large amounts of fluid. Majority of them clinically manifest during childhood; with about 50% of them present at birth. Symptomatic inflammatory reactions in lymphangiomas are very common. When compared with Hemangiomas, lymphangiomas are usually softer and more compressible and may transilluminate. It can also be diagnosed using CT, sonography, MRI and Sialography, salivary gland scintigraphy or tumor aspiration/ contrast injection. The treatment of choice is complete excision. Sclerotherapy is an alternative treatment option when surgical management is not possible⁶.

Neurilemoma (Schwannoma)

Schwannoma (neurilemmoma) is a slow growing encapsulated tumor of neuroectodermal derivation that originates from the Schwann cells of the neural sheath. Approximately, 25-30% of all reported schwannomas occur in the head and neck and most of these in the eighth nerve⁷. Schwannoma of the parotid gland is rare and may be mistaken as pleomorphic adenoma. Cytological features such as small fascicles of cells and wavy spindle-shaped nuclei are helpful features to distinguish this tumor from pleomorphic adenoma.⁸ Distinctive pathologic features of schwannoma include a dimorphic growth pattern comprising of cellular (Antoni A) and loose-textured (Antoni B) areas, Verocay bodies and hyaline blood vessels.⁹ With early diagnosis of parotid schwannoma by FNAC, management of patient can be planned and ultimately, facial nerve function can be optimized.⁸

Neurofibroma

Neurofibromas are benign nerve sheath tumours, which present in three forms; local discrete, generalized neurofibromatosis and plexiform neurofibromas. Neurofibromas constitute only 0.4% of all salivary neoplasms.¹⁰ The neurofibroma is not encapsulated, is more likely to be diffuse or multiple, and may be associated with Von Recklinghausen's disease.² Neurofibromas represent 14 % of all benign mesenchymal tumors affecting the salivary gland. It is present as a solitary lesion, it occurs as a slow growing, painless nodule that is firm to palpation. The histologic appearance of the neurofibroma is quite variable, depending on the nature of its stroma and degree of cellularity. Conservative excision is the treatment of choice.

Extracranial Meningioma

Meningiomas are the second most common group of brain tumors, accounting for 13 to 18% of all primary intracranial neoplasms. In rare instances, meningiomas

also occur in extracranial locations, such as the nasal cavity, paranasal sinuses, parapharyngeal space, cervical region or parotid gland. Meningiomas involving the major salivary gland are exceedingly rare.¹¹ Four mechanisms of the formation of ectopic meningioma have been suggested: (1) direct extension of an intra-cranial lesion, (2) distant metastasis from an intra-cranial meningioma, (3) origination from arachnoid cells within the sheaths of cranial nerves and (4) origination from embryonic nests of arachnoid cells. The treatment of choice for extra-cranial meningiomas is surgical excision and it has good prognosis.¹²

Nodular Fasciitis

It is a benign, probably reactive, fibroblastic growth with pseudosarcomatous features. It most commonly involves the parotid gland. A 4:1 predominance of occurrence is seen in male patients. Usually affects individuals in the 3rd decade of life. The most disturbing clinical feature is rapid growth. When it arises from the parotid sheath, the lesion appears well circumscribed but unencapsulated and may infiltrate the parenchyma of the gland. It is difficult to distinguish nodular fasciitis from pleomorphic adenoma by FNAC. The aspirate material shows cohesive parts composed of cells that had oval or spindle nuclei and relatively abundant cytoplasm and some cells with plasmacytoid features. The background substance is fibromyxoid. IHC stains positive for SMA and CD-68. Nodular fasciitis behaves in a benign fashion with rare recurrence after local excision. Spontaneous regression has been known to occur.^{2,13}

Fibrous Histiocytoma

Fibrous histiocytoma is considered to be a true neoplasm and is composed of an admixture of fibroblasts and histiocyte-like cells that are often arranged in a cartwheel configuration with varying numbers of inflammatory cells, xanthoma cells, and hemosiderin-laden macrophages.

Fibrous histiocytoma in the major salivary glands are rare- seven cases reported in parotid gland and two in submandibular gland. Benign fibrous histiocytoma exhibits fairly frequent reactivity to leucocyte common antigen. Electron microscope studies have revealed the presence of myofibroblasts and rounded cells resembling histiocytes. Surgical excision is the treatment of choice.¹⁴

Fibromatosis

It is a deceptively benign-appearing tumor with the tendency to progressively enlarge, infiltrate adjacent tissues and recur.² The Tumor occurs as a painless, sessile mass that may be partially fixed to adjacent and underlying tissues. The rate of growth is slow and steady. Most commonly involves the parotid gland when compared to submandibular gland. Males and females are equally affected. It is characterized by a

poorly circumscribed mass of collagenous fibrous connective tissue that infiltrates surrounding tissue. The most widely accepted treatment is a wide en bloc excision of the tumor. Radiation therapy can also be used.¹⁵

Myxoma

The myxoma is a benign mesenchymal tumor composed of stringy, gelatinous tissue that microscopically resembles the core of the umbilical cord.² Several theories concerning the pathogenesis of this tumor include - fibroblasts or myofibroblasts could produce an excess of mucopolysaccharides and were commonly incapable of forming mature collagen even if some cells could retain their capacity. Another theory attributed the origin of these tumors to mesenchymal elements derived from dental papilla, dental follicle or periodontal membrane.¹⁶

The tumor commonly affecting the parotid region usually associated with pain and facial paralysis. The myxoma is composed of an abundant mucoid stroma, sparse cells with small hyperchromatic nuclei and indistinct cytoplasm, and a meshwork of delicate reticular fibers. Superficial parotidectomy is the initial treatment of choice.

Lipoma

Lipoma is the most common mesenchymal neoplasm in the human body and may occur in the major salivary glands. Parotid gland Lipomas reported to constitute 1 to 4 % of all salivary gland tumors and 18.5 to 22.5 % of non-epithelial salivary gland tumors.² In a superficial location, the Lipoma usually present as an asymptomatic, round or ovoid nodule of a moderately firm, doughy consistency that is readily movable. The tumor shows a well-defined mass of mature adipose tissue that is usually separated from adjacent gland by a fibrous capsule.

On the basis of proportion and distribution of adipose tissue, the tumor could be categorized in to 3 main groups¹⁷: Ordinary Lipoma, Oncocytic lipoadenoma, Non Oncocytic sialolipoma. Sialolipoma is a new distinct variant, is characterized by proliferation of mature adipocytes with secondary entrapment of normal salivary gland element.¹⁸ Usually, Superficial lobectomy with preservation of the facial nerve is aimed for treatment.

Angiomyoma

Angiomyoma is a common soft tissue tumour of the head and neck that sometimes presents to the otolaryngologist; however, it seldom occurs in the major salivary glands.¹⁹ The Angiomyoma (vascular leiomyoma) is a solitary tumor of smooth muscle that presents as firm subcutaneous nodules than 2 cm in diameter. The characteristic appearance is that of an encapsulated nodule of smooth muscle that contains thick walled vessels and narrow lumina.² Special stains,

such as masons trichrome or phosphotungstic acid-hematoxylin can be used to demonstrate myofibrils. Simple excision is the treatment of choice.

Malignant Hemangiopericytoma (HPC)

HPCs are uncommon vascular tumors arising from perivascular cells known as pericytes. The single most common type of sarcoma within the major salivary gland is haemangiopericytoma. HPCs present as painless slow growing tumors. Diagnostic work up includes CT and or/ MRI. Definitive diagnosis is made through histopathology, which allows the observation of a neoplasm composed of cells similar to fibroblasts, with little or no mitotic activity distributing in a fasciculate and storiform pattern along a stroma rich in collagen that resembles a cheloid. This tumor usually shows positivity for CD34, CD99, Vimentin, laminin and type IV collagen; it yields negative results with cytokeratin, EMA, S100, smooth muscle actin and desmin, The treatment of choice for HPCs from any location is surgical resection of the encapsulated tumor along with the gland.²⁰

Angiosarcoma

An Angiosarcoma is an uncommon malignant neoplasms characterized by rapidly proliferating, extensively infiltrating anaplastic cells derived from blood vessels.² Oral and salivary gland Angiosarcomas are extremely rare, comprising only 25% of a series of all Angiosarcomas. The most common Angiosarcoma morphology in the oral and salivary gland location is spindled, vasoformative and solid. One third of oral and salivary gland Angiosarcomas in the literatures are the unusual epithelioid Angiosarcoma variant.²¹

Malignant Schwannoma

It is a neural tumor that may arise from facial nerve and present as salivary gland tumor. The tumor is slow growing, usually asymptomatic, neurologic signs when associated with nerve compression. The tumor consist of cells with wavy nuclei and irregular nuclear contours that are arranged in densely cellular fascicles. Malignant epithelioid schwannomas unlike carcinoma but similar to melanomas may be immune reactive with LEU-7 and S-100 protein and unreactive for keratin.²

Malignant Fibrous Histiocytoma

Malignant fibrous histiocytoma is an uncommon, aggressive pleomorphic tumor that originates from the tissue histiocyte or "facultative fibroblast". Considerable controversy surrounds the histiogenesis of fibrous histiocytoma - histiocytes and undifferentiated mesenchymal cells.²² Only a few cases of primary MFH arising in salivary gland have been reported. The histologic sections revealed proliferation of spindle fibroblasts with large numbers of bizarre, multinucleated giant cells and mononuclear cells resemble histiocyte, arranged in short fascicles and loose

storiform patterns with large nucleus. Immunostaining of the tumor cells is negative for cytokeratin, epithelial membrane antigen, desmin, vimentin and S 100 protein. Weak focal staining for smooth muscle actin is seen in some cells.²³

Rhabdomyosarcoma

Rhabdomyosarcoma is a cancerous (malignant) tumor of the skeletal muscles. It is a rare tumor that can be seen in the parotid gland (88% cases). The tumor cells are encapsulated, the tumor composed primarily of relatively uniform, intercalating bundles of plump spindle cells with vesicular nuclei. Occasionally rounded multinucleated giant cells with acidophilic granular cytoplasm can be seen; tadpole like cells also can be seen. Tumor can metastasize to lung and other sites, including brain; small bowel, heart and pancreas were often involved. Metastatic rate was higher for tumor located in the submandibular gland than that of parotid gland.²⁴

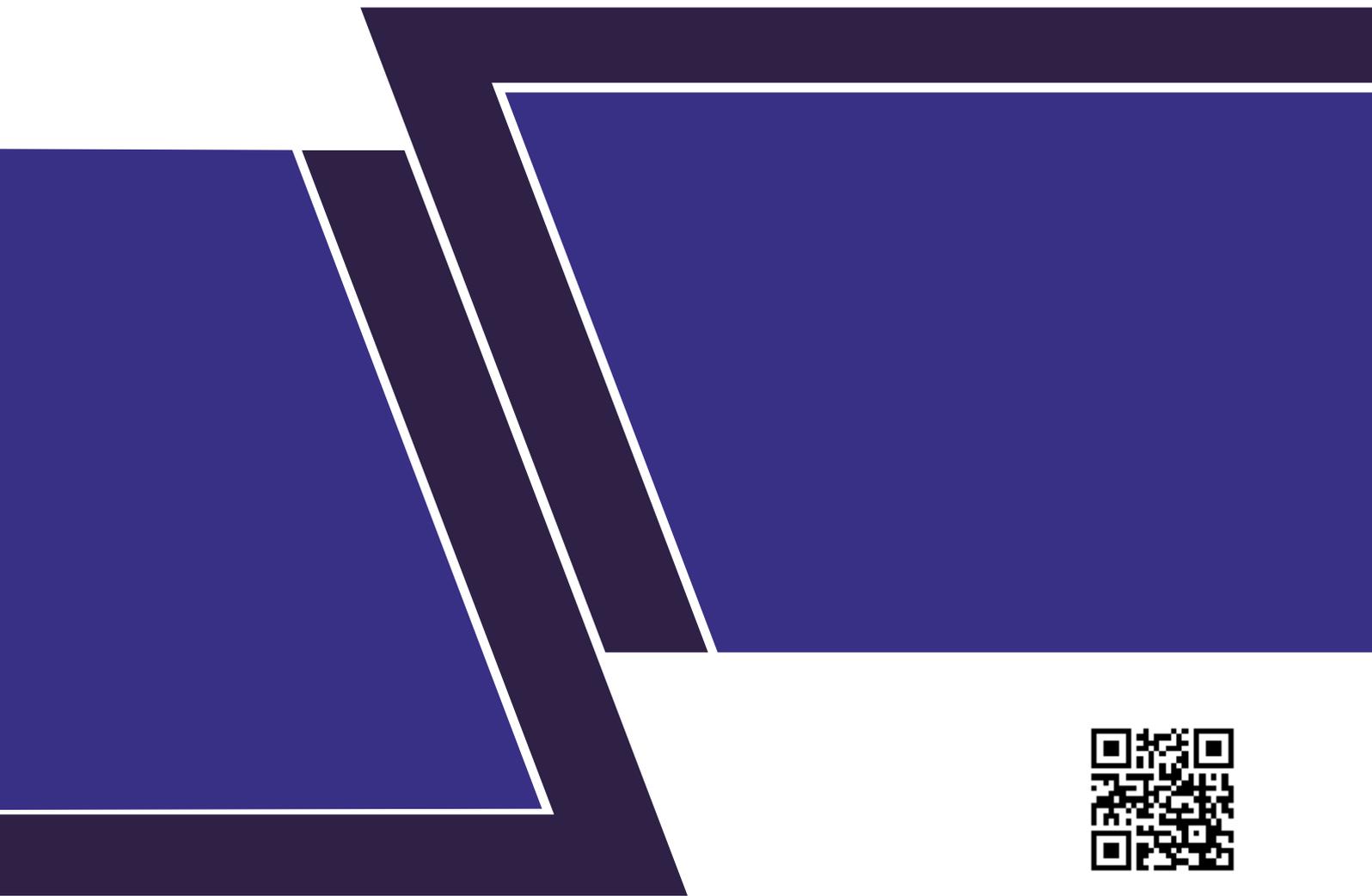
Conclusion

All the swellings/growth occurring in the salivary glands may not be due to infections, hyperplasia, but may be due to benign or malignant neoplasm. Because of this all salivary gland enlargement should be viewed seriously. The neoplasms may be epithelial/stromal in origin. Stromal salivary gland can be benign or sarcomatous. Since sarcomas are common in younger age and is more aggressive or poor prognosis, early diagnosis and treatment plan is mandatory for patient survival. A thorough knowledge of these stromal tumors will aid in better identification and early diagnosis.

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