SMOKING AS A RISK FACTOR FOR DRY SOCKET COMPLICATION:
A CASE CONTROL STUDY
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ABSTRACT:
Alveolar osteitis which is also known as dry socket, is an inflammation of the alveolar bone. Usually, this occurs as a postoperative complication of tooth extraction.(Jesudasan, Abdul Wahab and Muthu Sekhar, 2015). Alveolar osteitis can occur where the blood clot fails to form or is lost from the socket. This result in empty socket where bone is exposed to the oral cavity,(Packiri, Gurunathan and Selvarasu, 2017) causing a localized alveolar osteitis limited to the lamina dura .(Vijayakumar Jain et al., 2019) This most specific type is known as dry socket and is associated with increased pain and delayed healing time.¹ The Dry socket occurs in about 0.5–5% of routine dental extractions, and in about 25–30% of Since alveolar osteitis is not primarily an infection, there is not usually any pyrexia (fever) and cervical lymphadenitis (swollen glands in the neck), and only minimal edema (swelling) and erythema (redness) is present in the soft tissues surrounding the socket. In materials and methods, there are certain requirements that are necessary such as case control study for a better understanding, patients details who visited Saveetha dental college for a background check, data obtained from DIAS to ensure that the data can be supported. The study setting is a university based setting was with proper records and reviews from Saveetha Dental College. While the setting was being taken place, there were various pros and cons found where in pros, reasonable data was analysed and found from DIAS and this study comes under a case control study. While in cons, geographic restriction was found before we can proceed with the materials and methods it is important and compulsory that we get the approval from the ethical committee and the respected guides from Saveetha dental college.

We can conclude that majority of non-smokers are higher in females with dry socket complications where the mean value of patients with smoking habit has a value of 3.24. The gender prevalence of this study is Female>Male. From
the age range we can conclude that the age group 28 years to 47 years > 55 years to 74 years and finally the readings shows positive statistically significant correlation between smoking habit and dry socket.

**Keywords:** Alveolar osteitis, alveolar bone, extraction, dry socket, healing time, smokers

**How to cite this article:** Raj K, Pradu D (2020): Smoking as a risk factor for dry socket complications: A case control study, Ann Trop Med & Public Health; 23(S22): SP232310. DOI: http://doi.org/10.36295/ASRO.2020.232310

**INTRODUCTION:**

Alveolar osteitis (Khalifah, 2018) which is also known as dry socket, is an inflammation of the alveolar bone. Usually, this occurs as a postoperative complication of tooth extraction.(Jesudasan, Abdul Wahab and Muthu Sekhar, 2015). Alveolar osteitis can occur where the blood clot fails to form or is lost from the socket. This leaves the empty socket where bone is exposed to the oral cavity.(Packiri, Gurunathan and Selvarasu, 2017) causing a localized alveolar osteitis limited to the lamina dura.(Vijayakumar Jain et al., 2019) This most specific type is known as dry socket and is associated with increased pain and delayed healing time.[1]. The Dry socket occurs in about 0.5–5% of routine dental extractions, and in about 25–30% of Since alveolar osteitis is not primarily an infection, there is not usually any pyrexia (fever) and cervical lymphadenitis (swollen glands in the neck), and only minimal edema (swelling) and erythema (redness) is present in the soft tissues surrounding the socket.(Kumar, 2017a; Packiri, Gurunathan and Selvarasu, 2017). The signs may include the empty socket, which is totally devoid of blood clot and the exposed bone may be visible or the socket may be filled with food debris which reveals the exposed bone once it is removed.(Patil et al., 2017) The exposed bone is extremely painful and sensitive to touch surrounding inflamed soft tissues may overlie the socket and hide the dry socket from casual examination.(Christabel et al., 2016).Denuded bone walls. Symptoms may include, Dull, aching, throbbing pain in the area of the socket, which is moderate to severe and may radiate to other parts of the head such as the ear, eye, temple and neck.(Nusair and Abu Younis, 2007) The pain normally starts on the seThis can be another cause of pain in a socket, and causes delayed healing.(Kumar, Patil and Munoli, 2015) A dental radiograph (x-ray) may be indicated to demonstrate such a suspected fragment.[8]. Treatment is usually symptomatic, and also the removal of debris from the socket by irrigation with saline or local anesthetic. Medicated dressings are also commonly placed in the socket; although these will act as a foreign body and prolong healing, they are usually needed due to the pain.(Rao and Santhosh Kumar, 2018) The dressings are usually stopped once the pain is lessened. Examples of medicated dressings include antibacterials, topical anesthetics and obtundants, or combinations of all three.(Kumar and Sneha, 2016), e.g., zinc oxide and eugenol impregnated cotton pellets, algoyl (eugenol, iodoform and butamen), dentalone, bismuth subnitrate and iodoform paste (BIPP) on ribbon gauze and metronidazole and lidocaine ointment(Abhinav et al., 2019). A 2012 review of treatments for dry socket concluded that there was not enough evidence to determine the effectiveness of any treatments.(Jesudasan, Abdul Wahab and Muthu Sekhar, 2015; Kumar and Rahman, 2017) People who develop a dry socket typically seek healthcare advice several times
after the dental extraction, where the old dressing is removed, the socket irrigated and a new dressing placed. (Kumar and Sneha, 2016) Curettage of the socket increases the pain and whether it is of overall benefit is debate.

A dry socket can occur three to four days after an adult tooth is removed from the alveolar bone of the mandible (Marimuthu et al., 2018). The blood clot that should form after removal is dislodged or dissolved before the wound heals where it exposes the underlying bone and nerves. The dry socket is also known as an alveolar osteitis, which is one of the main complications of extraction. (Kumar, 2017b) Post operative pain is present on the site of extraction and the pain increases one to three days after extraction. The dry socket heals partially, and a disintegrated blood clot forms as an alveolar socket and causes halitosis. (Kumar, Patil and Munoli, 2015; Kumar and Sneha, 2016). A retrospective review of the records of patients who presented with dry socket at the facility were received and reviewed for the first quarter of 2015 [Mudali et al, SADJ (2016) studies have demonstrated the link between dry socket and smoking, with some studies pointing towards a dependant relationship. [Nusair et al, JCOP, (2007)]. This study were to find out the frequency, clinical pictures and risk factors of dry socket at the Dental teaching centre of AL-Quds University in Palestine. [Mohammed et al, open distribution, (2001)]. The risk factors of dry socket complication increases as smoking substances such as tobacco, nicotine, continue, carbon monoxide, hydrogen cyanide are all the substances that causes cytotoxic reaction and prevents wound healing. Nicotine platelet adhesiveness have microvascular occlusion and tissue which is serious. (Patturaja and Pradeep, 2016). The aim of this study is to compare the prevalence of dry socket and smoking as a risk factor in patients visiting Saveetha Dental College. The objective of this study is to improve the evidence base in Saveetha Dental College by the data collected for the framework for research proposals.

MATERIALS AND METHODS:

In materials and methods, there are certain requirements that are necessary such as case control study for a better understanding, patients details who visited Saveetha dental college for a background check, data obtained from the outpatient record to ensure that the data can be supported. The study setting is a university based setting was with proper records and reviews from Saveetha Dental College. While the setting was being taken place, there were various pros and cons found where in pros, reasonable data was analysed and found from outpatient record and this study comes under a case control study. While in cons, geographic restriction was found before we can proceed with the materials and methods it is important and compulsory that we get the approval from the ethical committee and the respected guides from Saveetha dental college.

There are a total number of 3 people involved where there is one guide involved, followed by one receiver and one researcher. From sampling we can conclude that from 21st of June 2019 to 21st of March 2020 the sampling was done from the given data followed by the total number of case sheets reviewed. Gross checking of the data is necessary, data such as the outpatient record, outpatient records of patient photographs and an additional reviewer. Minimisation of the bias should be done to ensure the matched controls are taken. Prevention of the sampling bias should be taken where simple random sampling is done where the internal validity shows yes while the external validity shows no.

Under data collection, assessment of the clinical examination should be done in the outpatient record where the analysis of dry sockets should be done followed by the photographs of the cases. Tabulation of the recorded and
reviewed data should be done in Excel sheet, after all that is done the SPSS software is used to retrieve the graphs and bar charts according to the given data but the censored data management must be excluded.

Under analytics, the statistical test used for this study is the Mann-Whitney U-test and it is the most common test used among studies done. The software used is the SPSS software which is commonly used to retrieve the data in graph forms. The independent variables that are used in this study are age and gender and the steps should be followed in statistical analysis.

RESULTS & DISCUSSION:
From this study we can conclude that majority of non-smokers are higher in females with dry socket complications where the mean value of patients with smoking habit has a value of 3.24. The gender prevalence of this study is Female>Male. From the age range we can conclude that the age group 28 years to 47 years > 55 years to 74 years and finally the readings shows positive statistically significant correlation between smoking habit and dry socket. (Chi square Test, P value <0.05). Under the graph, it shows the distribution of smoking in where there are 76.5% of patients that are absent in smoking followed by 23.5% of patients that are present in smoking. In gender we can conclude that the female percentage 52.9% is higher compared to the males percentage 47.1% and in the age group it shows that the age group 28 years to 47 years have a higher percentage 53.1% compared to the age group 55 years to 74 years with a percentage of 46.9%. A supportive study was taken to support this study, Mosaad Abdel Jawad Khalifah, 2018 current reviewer regards to risk factors, age, surgical trauma, smoking, oral contraceptives and poor oral hygiene as a major risk factors. A previous study was also taken where a majority of studies from the fourth decade shows more females have dry socket compared to males and there is no contradiction with the study which is not in line with the study.

There should be a correlation between age, gender, smoking habit and dry sockets and the majority of them are females, patients with smoking habit are present but only in very small amount. No contradiction study is in line of references and females are more compared to males.

Limitations are important in a study where the limited sample size should be present, geographic limitation should be limited as it comes under the unicentric study. There should be one specific ethnic group and the data may have descriptions accordingly. The future scope of this study is to show the dry socket and how its affected is smoking is present and with a move widely carried out to study in different regions of the world and is not confined to a single geographical location with proper data.

CONCLUSION:
From this study we can conclude that within the limitations of the present study, majority of patients with dry socket are females with the age group 28 year to 47 years and less in patient smoking habit while, patients from the age 55 years to 74 years are more commonly involved.
REFERENCES:


### Smoking (Provide smaller version of this table)

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<th>Cumulative Percent</th>
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<table>
<thead>
<tr>
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<tr>
<td>Total</td>
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</table>

**Smoking (Provide smaller version of this table)**

Table 1: Correlation showing smoking. Shows majority of patients are absent in smoking with a total value of 13 patients.

Table 2: Correlation showing, gender. Where the number of females are higher than males and a total number of 30 patients.

<table>
<thead>
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<td>6.7</td>
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</table>
Table 2: Correlation showing age. Shows majority of patients in the age group from 60 years 70 is more prone.
Figure 1. Bar graph shows the gender distribution among the patients with dry socket. From the graph we can observe that most of the female patients have a higher frequency of dry socket cases with a value of (52.94%) and above while male patients who have a frequency value at (47.06%) is lower compared to females.
Figure 2. Bar graph shows the distribution of absence/presence of smoking habit and the frequency of cases of dry socket complications. From the graph we can observe that a most of the patients that are non-smokers have a higher frequency of cases (76.47%) while patients who are smokers have a smaller value (23.53%) compared to non-smokers.
Figure 3: Bar graph showing association between gender and smoking habit in patients with the incidence of dry socket. The X-axis represents the gender of patients with dry sockets. The Y-axis represents the number of patients with dry socket. The graph explains that female patients (9 with 52.94%) are predominant with the incidence of dry socket compared to male patients (8 with 47.06%). Chi-Square test was done and the association between the gender and dry socket was found to be statistically significant since p-value <0.05. (The Chi Square Test shows p=0.015 as a significant.) Hence proving that there is a definitive association present between gender and incidence of dry socket.
Figure 4: Bar graph showing association between gender and the incidence of dry socket. The X-axis represents the presence of dry sockets among male and female patients. The Y-axis represents the number of cases with dry socket. The graph explains that female patients (9 with 52.94%) are predominant with the incidence of dry socket compared to male patients (8 with 47.06%). Chi-Square test was done and the association between the gender and dry socket was found to be statistically significant since p value <0.05. (The Chi Square Test shows p=0.015 as a significant.) Hence proving that there is a definitive association present between gender and incidence of dry socket.
Figure 5: Bar graph showing the age distribution among patients with incidence of dry socket. X-axis represents the age range of patients with dry socket. The Y-axis represents the number of patients with dry socket. The graph explains that the highest incidence of dry socket occurs in age range 35-44 (BLUE) and 55-64 years (PURPLE) of age shows equal distribution (23.53%) and age range from 25-34 (PINK), 25-54 and 65-74 (YELLOW) years of age shows equal distribution (17.65%). Chi-Square Test was done and the association between age and incidence of dry socket due to smoking was found to be statistically significant as the p value is less than 0.05. (Pearson Chi-Square value shown as 5.885 and the p value was 0.015.) proving that there is a definitive association present between age and incidence of dry socket.
Figure 6. Bar graph showing the association of age range and smoking habit among patients with dry socket. X-axis shows the age range of patients with dry socket and Y-axis shows the number of patients with dry sockets. The highest number of smoking habit is seen in patients with an age range 45-54 (11.76%). However, the association between age range and smoking habit in patients with dry socket, was known to be statistically not significant (Pearson Chi-square test value = 5.421; df = 4; p = 0.247 (p > 0.05) - not significant). Implying there is no association between age range and smoking habits among patients with dry socket.