

## Incidence of Dry Socket in South Chennai Population: A Retrospective Study

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### Abstract:

**Background:** The aim of this study is to identify the incidence, risk factors and to evaluate the management of dry socket in South Chennai population.

**Materials and Methods:** This study was performed in a private dental center in Chennai, Tamil Nadu, India. A retrospective study of 1013 patients who underwent extraction of their tooth/teeth for various reasons from January 2012 to December 2013 was done. All types of extractions, excluding deciduous teeth extraction, were included in this study.

**Results:** Out of 1341 extractions, 72 (5.37%) extractions were complicated by a dry socket in which 44 (7.86%) were in females, and 28 (6.18%) were in males. The dry socket was more common in mandibular third molars (9.4%).

**Conclusion:** From the results of this study, the incidence of dry socket was 5.37% in South Chennai population. The incidence of dry socket was higher in females than in males, and it was commonly seen after the extraction of mandibular third molars.

**Key Words:** Dry socket, extraction, mandible, maxilla

### Introduction

In 1896, Crawford was the first person who coined the term "dry socket." Dry socket is an acute inflammation of the alveolar bone seen around the site of the extracted tooth. The clinical features include severe pain, destruction of the clot formed within the socket (devoid of clot), and mainly the socket is often filled with food debris.<sup>1</sup> The rate of incidence has been reported to vary from 0% to more than 35% and

usually follows the extraction of mandibular third molar.<sup>2</sup> The main reason for dry socket is disintegration of the blood clot by fibrinolysis.<sup>3</sup>

According to earlier studies, there are a number of factors attributing to the formation of dry socket. They are amount of trauma during extraction, systemic illness such as diabetes mellitus, pre, and post-operative infection at the extraction site, irradiation, and use of oral contraceptives, failure to comply with post-extraction instructions, smoking habits, underlying pathologies, bone disorders, and clotting problems.<sup>4,6</sup>

The treatment regimen for dry socket is systematic. Local applications of antibacterials, anti-inflammatory agents, and antifibrinolytic agents are widely used. Clot support agents have also been implicated for the treatment of dry socket.<sup>7</sup> Dry socket is generally a self-limited complication and so prevention is more effective in dry socket.<sup>8</sup>

Dry socket is also known by various names such as alveolar osteitis, localized osteitis, alveolgia, alveolitis sicca dolorosa, septic socket, necrotic socket, localized osteomyelitis, and fibrinolytic alveolitis.<sup>9</sup>

The aim of this study is to identify the incidence, risk factors, and to evaluate the management of dry socket in South Chennai population.

### Materials and Methods

This study was performed in a private dental center in Chennai, Tamil Nadu India. Case records of all patients who had undergone extraction of their permanent tooth or teeth from January 2012 to December 2013 were obtained from the records department. Information retrieved from the case records were patients' biodata, oral hygiene status, smoking habits, systemic factors, diagnosis and indication for teeth extraction, number of tooth/teeth extracted, method of extraction, compliance to post extraction instructions, occurrence of dry socket during follow-up, and management of dry socket. All types of extraction, excluding deciduous tooth extraction, were included for this study.

To define dry socket according to Blum's criteria, patients should have at least two of the following signs and symptoms.<sup>4</sup> They are:

1. Pain in or around the socket within 1 week of the extraction
2. Empty socket.

The data were analyzed by Chi-square test, and P value was set at 0.05 as the level of significance.

**Results**

A total of 1341 permanent teeth were extracted in 1013 patients during this study period. Out of 1013 patients, 453 (44.72%) patients were male and 560 (55.28%) patients were female.

Out of 1341 extractions, 72 (5.37%) extractions were complicated by dry socket in which 44 (6.18%) were in females and 28 (7.86%) were in males. This difference was statistically insignificant (P = 0.6419). Distribution of dry socket according to the study variables was presented in Tables 1-8.

Age of the patients ranged from 18 to 69 years. 20-30 years age group was more susceptible to the occurrence of dry socket

followed by 40-50 years age group, 30-40 years age group, <20 years age group, 60-70 years age group, and 50-60 years age group. This difference was statistically significant (P = 0.007).

Out of 72 dry sockets, 49 (6.10%) dry sockets were in the mandible and 23 (4.28%) dry sockets were in the maxilla. This difference was statistically insignificant (P = 0.56).

Among maxillary teeth, the highest frequency of dry socket was seen in the third molar (6.13%) followed by first molar (5.23%) and second molar (4.08%). This difference was statistically insignificant (P = 0.06).

Among mandibular teeth, the highest frequency of dry socket was seen in the third molar (9.4%), followed by first molar (5.66%), and second molar (5.26%). This difference was statistically significant (P = 0.001).

**Table 1: Distribution of dry socket by gender.**

Gender	Number of patients (%)	Number of dry sockets (%)	Chi-square	P value
Male	453 (44.72)	28 (6.18)	0.2162	0.6419
Female	560 (55.28)	44 (7.86)		
Total	1013 (100)	72 (14.04)		

**Table 2: Distribution of dry socket by age groups.**

Age groups (years)	Number of extractions (%)	Number of dry sockets (%)	Chi-square	P value
≤20	80 (5.97)	3 (3.75)	15.78	0.007*
20-30	447 (33.33)	45 (10.07)		
30-40	312 (23.27)	16 (5.12)		
40-50	109 (8.13)	6 (5.5)		
50-60	224 (16.7)	1 (0.45)		
60-70	169 (12.6)	1 (0.6)		
Total	1341 (100)	72 (25.49)		

\*Significant

**Table 3: Distribution of dry socket by jaw.**

Jaw	Number of extractions (%)	Number of dry sockets (%)	Chi-square	P value
Maxilla	538 (40.12)	23 (4.28)	0.33	0.56
Mandible	803 (59.88)	49 (6.1)		
Total	1341 (100)	72 (10.38)		

**Table 4: Distribution of dry socket by maxillary teeth.**

Maxillary teeth	Number of extractions (%)	Number of dry sockets (%)	Chi-square	P value
3 <sup>rd</sup> molar	163 (30.3)	10 (6.13)	13.25	0.06
2 <sup>nd</sup> molar	98 (18.22)	4 (4.08)		
1 <sup>st</sup> molar	114 (21.19)	6 (5.23)		
2 <sup>nd</sup> premolar	45 (8.36)	1 (2.22)		
1 <sup>st</sup> premolar	63 (11.71)	1 (1.59)		
Canine	29 (5.39)	1 (3.45)		
Lateral incisor	12 (2.23)	0		
Central incisor	14 (2.6)	0		
Total	538 (100)	23 (22.7)		

**Table 5: Distribution of dry socket by mandibular teeth.**

Mandibular teeth	Number of extractions (%)	Number of dry sockets (%)	Chi-square	P value
3 <sup>rd</sup> molar	234 (29.14)	22 (9.4)	23.69	0.001*
2 <sup>nd</sup> molar	152 (18.93)	8 (5.26)		
1 <sup>st</sup> molar	265 (33)	15 (5.66)		
2 <sup>nd</sup> premolar	43 (5.35)	2 (4.65)		
1 <sup>st</sup> premolar	61 (7.6)	2 (3.28)		
Canine	23 (2.86)	0		
Lateral incisor	20 (2.49)	0		
Central incisor	5 (0.63)	0		
Total	803 (100)	49 (28.25)		

\*Significant

**Table 6: Distribution of dry socket by single/multiple extractions.**

Extractions	Number of patients (%)	Number of dry sockets (%)	Chi-square	P value
Single extractions	775 (76.51)	71 (9.16)	8.37	0.003*
Multiple extractions	238 (23.49)	1 (0.42)		
Total	1013 (100)	72 (9.58)		

\*Significant

**Table 7: Distribution of dry socket by type of extraction.**

Type	Number of extractions (%)	Number of dry sockets (%)	Chi-square	P value
Non-surgical	1267 (94.5)	58 (4.58)	9.98	0.001*
Surgical	74 (5.5)	14 (18.99)		
Total	1341 (100)	72 (23.57)		

\*Significant

**Table 8: Distribution of dry socket by medical history.**

Medical history	Number of patients (%)	Number of dry sockets (%)	Chi-square	P value
Yes	831 (82.03)	63 (5.59)	0.2	0.65
No	182 (17.97)	9 (4.22)		
Total	1013 (100)	72 (9.81)		

Single tooth extractions (9.16%) had a higher number of dry sockets compared to multiple teeth extractions (0.42%). This difference was statistically significant ( $P = 0.003$ ).

Out of 72 dry sockets, 58 dry sockets were followed by non-surgical extraction and 14 dry sockets were followed by surgical extraction. Dry socket incidence following non-surgical extractions was 4.58% while dry socket incidence following surgical extraction was 18.99%. This difference was statistically significant ( $P = 0.001$ ).

Out of 1013 patients, 182 (17.97%) patients had various underlying systemic diseases such as hypertension, diabetes, bronchial asthma, ischemic heart disease, hyperthyroidism, hypothyroidism, and peptic ulcer. Out of 72 dry sockets, 63 (5.59%) dry sockets occurred in patients without systemic diseases, and 9 (4.22%) dry sockets occurred in patients with systemic diseases. This difference was statistically insignificant ( $P = 0.65$ ).

### Discussion

One of the most common complications in dentistry is dry socket. It usually occurs after the extraction of mandibular third molar. Previous studies reported its prevalence from 0% to more than 35%.<sup>2</sup> Incidence of dry socket was 5.37% for all extractions in this study. This rate was higher than the prevalence estimated by previous studies which were conducted in Nigeria, Sri Lanka, Nepal, Palestine, and some developing countries.<sup>10-13</sup>

This variation is mainly due to differences in diagnostic criteria and in the methods of assessment, patients' population with respect to age, operator's technique and skill, intraoperative and post-operative management of extraction sites, or technique of extractions (non-surgical/surgical extractions).<sup>12</sup>

In this study, the occurrence of dry socket in females was higher than in males which agreed with the earlier studies of Amaratunga and Senaratne<sup>11</sup> and Tjernberg *et al.*<sup>14</sup> The possible explanations were use of oral contraceptives and hormonal factors. And more women present with this problem as they have better health-seeking behavior than men.<sup>8,15</sup> However, some authors reported that there was no sex predilection in the incidence of dry socket's.<sup>4,16</sup>

Dry socket incidence is age dependant.<sup>17</sup> According to Hermes *et al.*, dry socket never occurs before the 18<sup>th</sup> or after the 50<sup>th</sup> year of life. In the present study, the peak incidence of dry socket was in 20–30 years age group.<sup>8</sup> These results were in agreement with the report of Oginni *et al.*,<sup>10</sup> Amaratunga and Senaratne,<sup>11</sup> Upadhyaya and Humagain.<sup>12</sup> The presence of well-developed alveolar bone and absence of periodontal disease at this age are the reasons for the peak evidence of dry socket in 20–30 years age group.<sup>18</sup>

Incidence of dry socket was more common in mandible than maxilla in this study group, and this was similar to earlier studies.<sup>11,12,16</sup> According to some of the earlier studies, a reduced capacity of producing granulation tissues, decreased vascularity and increased bone density are responsible for this site specificity.<sup>19</sup>

Dry socket is most commonly seen after the extraction of mandibular third molar teeth.<sup>20</sup> In the present study, incidence of dry socket was more in mandibular third molars (9.4%), followed by maxillary third molars (6.13%), and mandibular first molar (5.66%). This result agreed with Nusair and Younis, Oginni *et al.*<sup>10,21</sup> The possible reason is that traumatic extraction is more common in posterior teeth area which might increase dry socket formation.<sup>20</sup>

Tissue activators were released to the alveolar bone after trauma. This increases the incidence of dry socket in surgical extraction cases.<sup>22</sup> In this study, incidence of dry socket was higher in surgical extractions compared to non-surgical extractions and agreed with Abu Younis and Hantash.<sup>13</sup>

In this study, the incidence of dry socket in single tooth extraction was higher than multiple tooth extractions.<sup>13,18,23</sup> One possible explanation is that multiple extractions are mostly simple because they are performed on periodontally compromised teeth.<sup>13</sup>

Some of earlier studies showed a relationship between systemic diseases and incidence of dry socket. In this study, dry socket occurring in patients without underlying systemic disease was higher than patients with underlying systemic disease. This result was in agreement with the study of Eshghpour and Nejat, Nusair and Younis.<sup>17,21</sup>

The primary aim of treating dry socket is pain management until commencement of normal healing. Conventional method of treating dry socket in our center is:

1. Irrigate the socket with warm normal saline
2. Placement of Alvogyl®, Iodoform dressing (Septodent, Cambridge, ON, Canada)
3. Analgesics
4. Systemic antibiotics.

This procedure was repeated in each follow-up session. All patients were treated and followed until complete resolution.

### Conclusion

From the results of this study, the following conclusions can be made:

- The incidence of dry socket in south Chennai was 5.37%
- Females were commonly affected by dry sockets than males
- Dry sockets were commonly seen after the extraction of mandibular third molars

- The incidence of dry socket was higher in single tooth extractions than multiple teeth extractions
- The incidence of dry socket was higher in surgical extraction than non-surgical extractions.

Further studies are necessary to evaluate the incidence and risk factors of dry socket in other parts of India because of its massive population and wide geographic area.

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