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A Clinicopathological Co-Relation of Ludwig's Angina in a Tertiary Care Centre

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Abstract

Background: To evaluate the clinicopathological co-relation of Ludwig's angina in a tertiary care centre. **Methods**: The present prospective observational study was conducted among 12 patients attending the ENT department of Teerthanker Mahaveer Hospital and Research Centre, Moradabad & Oral Maxillofacial Surgery department of Dental College & Research Centre, Moradabad with submandibular space infections from November 2018–April 2020.Detailed history was taken followed by complete ENT examination after proper consent from the patients. Patients were investigated by doing USG of neck & FNAC from neck. CT scan of neck was done where applicable **Results:** Out of 12 patients, dental infection was suspected in 3 patients. USG neck detected pus in in 2 patients. Diabetes mellitus and hypertension was found among 3 (25%) and 1 (8.3%) cases. Incision and drainage was done in 5 (41.66%) patients. Culture & sensitivity was sterile and it may be due to patients already took treatment for this disease and may be anaerobic bacteria. **Conclusion**: Prompt diagnosis and surgical drainage with broad-spectrum antibiotics and if needed tracheostomy often give much better results in the treatment of Ludwig's angina. An early intervention of dental infection in early stages may be helpful in avoiding progression into Ludwig's angina.

Keywords: Ludwig's angina, Tracheostomy, Odontogenic infection

INTRODUCTION

Ludwig's angina was coined after the German physician, Wilhelm Friedrich von Ludwig who first described this condition in 1836 as a rapidly and frequently fatal progressive gangrenous cellulitis and edema of the soft tissues of the neck and floor of the mouth with progressive swelling of the soft tissues and elevation and posterior displacement of the tongue.[1]The most life-threatening complication of Ludwig's angina is airway obstruction. Prior to the development of antibiotics, mortality for Ludwig's angina exceeded 50%.[2] As a result of antibiotic therapy, along with improved imaging modalities and surgical techniques, mortality currently averages approximately 8%.[2,3]

In Ludwig's angina, the submandibular space is the primary site of infection.[4]This space is subdivided by the mylohyoid muscle into the sublingual space superiorly and the submaxillary space inferiorly. The majority of cases of Ludwig's angina are odontogenic, primarily resulting from infections of the second and third molars of mandible. The roots of these teeth penetrate the mylohyoid ridge such that any abscess, or dental infection, has direct access to the submaxillary space. Once infection develops, it spreads contiguously to the sublingual space. Infection can also spread contiguously to involve the pharyngomaxillary and

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retropharyngeal spaces, thereby encircling the airway. Other causes include peritonsillar or para pharyngeal abscesses, mandibular fractures, oral lacerations/piercing injuries or submandibular sialadenitis, and oral malignancy.[5] Predisposing factors include dental caries, recent dental treatment, systemic illnesses such as diabetes mellitus, malnutrition, alcoholism, compromised immune system such as AIDS and organ transplantation.[6,7,8,9] Commonly involved organisms are Streptococcus viridans and anaerobes like Fusobacterium nucleatum, Peptostreptococcus species, and Actinomyces species.[10] Other findings may be "woody" induration with crepitus and an erythematous floor of the mouth. By combining the physical exam findings, a clinical history, CT imaging, and possibly a Gram stain of aspirated fluid from the site, a timely diagnosis can be made so that appropriate treatment can begin before the serious complications take place.[11]The aim of the present study was to conduct clinicopathological co-relation of Ludwig's angina in a tertiary care center.

MATERIAL AND METHODS

The present prospective observational study was conducted among 12 patients attending the ENT department of Teerthanker Mahaveer Hospital and Research Centre, Moradabad & Oral Maxillofacial Surgery department of Dental College & Research Centre, Moradabad with submandibular space infections from November 2018–April 2020.

To calculate the sample size based on the prevalence with an approximate 95% confidence level, the following formula is applied:

$$n = z^2 * P * (100-P) / r^2$$

Where,

Z = 1.96 at 95% confidence interval

P = 96% (Prevalence of Ludwig's angina cause type 96%[12])

r = Absolute error = 5%

$n = (1.96*1.96*96*4)/5^2$

$= 1475.17/25$

$= 59.00$[minimum]

"As per Govt orders number 1090/5- 5- 2020 dated 04th May 2020- TMMC & RC has been dedicated COVID- 19 Hospital". Hence due to COVID situation, we were able to recruit onl 12 subjects in the study. The subjects were selected according to the inclusion and exclusion criteria:

Inclusion criteria

- All patients of Ludwig's angina who are admitted.
- Voluntary participation in the study.

Exclusion criteria: Patient declines consent.

The data collected was separated into six sub divisions:

I] Age and gender of the patient
II] Sign and symptoms
III] Investigations and examinations
IV] Neck sites and other sites involved
V] Treatment
VI] Outcome

Detailed history was taken followed by complete ENT examination after proper consent from the patients. Patients were investigated by doing USG of neck & FNAC from neck. CT scan of neck was done where applicable

Statistical analysis: Data was calculated and analysed suing SPSS software (verison 24).

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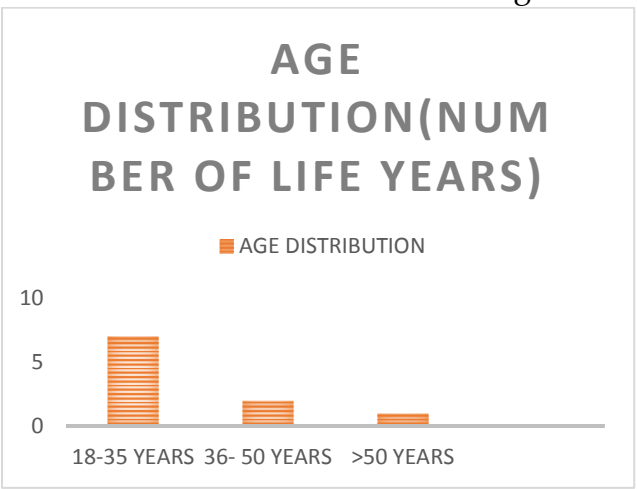
Figure 1: Before procedure

Figure 2: After procedure

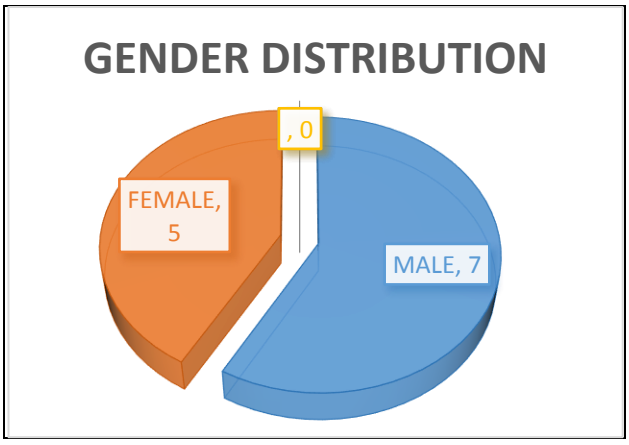
RESULTS

We included a total of 12 patients of "Ludwig's angina (LA)" cases. The airway obstruction is one of the cause of "Ludwig's angina (LA)". The treatment of Ludwig's angina can be non- surgical & surgical in the form of incision & drainage and tracheostomy etc. (figure 1, 2).In this study, we observed that age distribution of the patients ranged between 23 to 60 years and mainly seen in males.



Graph 1: Age distribution among the study subjects

In this study we observed that majority of patients were male preponderance without of12 patients i.e. males were 7[58.3%] and females were 5[41.7%] as shown in graph 2.



Graph 2: Gender distribution among the study subjects

Out of 12 patients, dental infection was suspected in 3 patients. USG neck detected pus in in 2 patients (graph 3).

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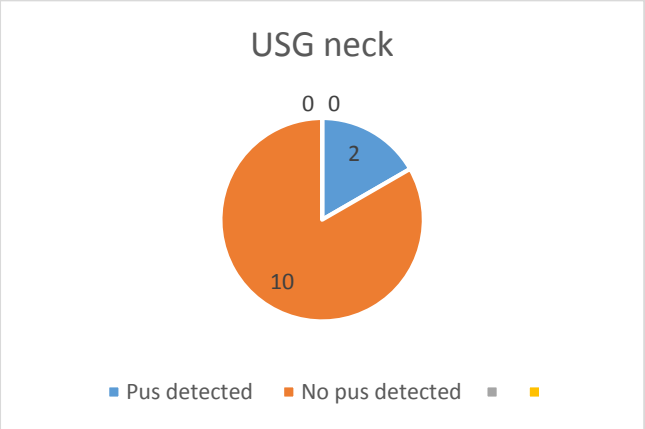
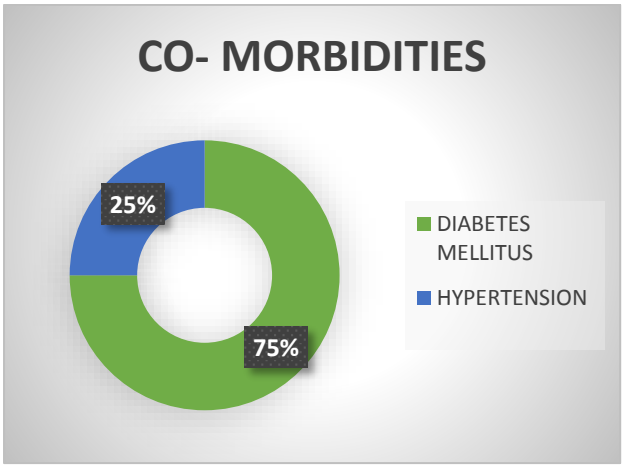


Graph 3: USG neck

Incision and drainage was donein 5 (41.66%) patients. Culture & sensitivity was sterile and it may be due to patients already took treatment for this disease and may be anaerobic bacteria. Diabetes mellitus and hypertension was found among 3 (25%) and 1 (8.3%) cases (graph 4).



Graph 4: Co-morbidities among the study subjects

DISCUSSION

Ludwig's angina is a potentially fatal diffuse cellulitis that affects the submandibular area and spreads to other deep neck areas on both sides, causing fast airway blockage and death. The fatality rate has dropped dramatically after the introduction of broad-spectrum antibiotics and timely airway treatment.[12]

In our study we observed that age distribution of the patients ranged between 23 to 60 years and mainly seen in males. Karuppasamy et al,[13] in their study too showed similar findings. The retrospective study of Yunus MRM et al,[12] reviewed the 7 patients cases in which 6 males and 1 female present ages between the range of 19 & 69 years with mean age of 38.7 years and the dental infection is the cause of majority of Ludwig's angina cases.

Out of 12 subjects, 3 cases are dental related as well as diabetic etc which is comparable to old studies like K Saifeldeen et al,[1]in which odontogenic infections are most common & in case of Sasikala Balasubramanian et al,[14] 3rd molar was infected. Karuppasamy et al,[13] in their study too showed similar findings. The retrospective study of Yunus MRM et al,[12]reported that the dental infection is the cause of majority of Ludwig's angina cases. It has been concluded that if the patient is having any of such comorbidities, the management should be more aggressive since the chance of developing fatal outcomes is common.

The treatment consists of airway maintenance, surgical drainage and broad-spectrum antibiotics. Tracheostomy is the gold standard in full-fledged airway compromise. Inour study, the need of tracheostomy was very in significant and we have managed majority with surgical drainage and antibiotic support.

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CONCLUSION

The major cause of Ludwig's angina is odontogenic infection. Pus was detected in 2 patients out of 12 patients. Diabetes Mellitus is the major co- morbidity in this condition while the incision & drainage was done in 5 patients. Despite the severity of the condition, prompt diagnosis and early surgical intervention with high-dose antibiotics will reduce the fatal outcome significantly. Early intervention on dental infections will almost completely prevent the occurrence of the condition.

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