



Ludwig's Angina: An Absolute Compulsion of Hospital Tarry

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Abstract

Background:Ludwig's Angina is a relentless, promptly intensifying, life threatening deadly cellulitis of submandibular space causing impediment of patient aerodigestive passage as a consequence of developing odynophagia, trismus and respiratory distress. Dental carries and infection, diabetes mellitus, poor oral hygiene and immune suppression are the main ingenious factor for it. Poor slum dwellers and villagers whose are unlettered, less learning about oral hygiene and inadequate support for hygienic living are pragmatic confession for Ludwig's Angina in the perspective view of the developing countries.

Methods:It is a cohort retrospective study of 193 cases of Ludwig's Angina in the department of Otolaryngology and Head-Neck surgery, Comilla Medical College, Bangladesh.

Result: Incidence of Ludwig's Angina out of total inpatient were 0.63% and out of total emergency patient were 4.80%. Of them male were 81.34% and female were 18.66%, 89.65% were above 41 years, 86.52% cleaned their tooth by charcoal, 93.78% had dental carries and 87.56% were diabetic. Anyhow 55.44% were slum dwellers, 40.41% were villagers whereas 77.20 % were smoker and 59.06% were betel leaf and nut chewer. Hospital tarried30.05% were up to 4 weeks, 40.95% were up to 6 weeksand 29% were above 6 weeks. 4(2.07%) were died from 193.

Conclusion: Definitely Ludwig's Angina is a devastating disease but not incurable. Dental hygiene should be maintain appropriately through learning process and awareness learning program should raise in the slum dwellers and villagers lowering the immensity of the disease.

Keywords: Ludwig's Angina(LWA); Life Threatening; Submandibular; Cellulitis; Gangrene;Orthopantomogram(OPG)

Introduction

LWA is an unimaginably life hazardous, swiftly advancing cellulitis affecting bilaterally submandibular, sublingual and submental space characterized by brawny swelling of submandibular region with life threatening edema of floor of mouth. It is mainly infection of submandibular space. The space lies between mucous membrane of the floor of the mouth and tongue one side and superficial layer of deep cervical fascia extending between the hyoid bone and mandible other side. It is divided into two compartments by mylohyoid muscle in which sublingual compartment lies above the mylohyoid muscle and submaxillary and submental compartment lies below the mylohyoid. The two compartment communicate with each other through the posterior border of mylohyoid muscle. Hippocrates and Galan first described that edematous swollen soft tissue causing fall back of the tongue and suffocation of airway lead to asphyxiate the patient [1]. German surgeon Karl Friedrich Wilhelm Von Ludwig clarify the disease in 1936 as a life threatening disease as airway obstruction and septic shock which increase the mortality rate above 50% and the disease was flourish by his name [2]. Afterwards two Otolaryngologist Grodinsky and Holyoke precedent the disease on their observation by four following distinctive criteria:

1. Bilateral cellulitis involving the sublingual and submaxillary space.
2. Produce gangrene with serosanguinus putrid infiltration but little or no frank pus.
3. Involves connective tissue, fascia and muscles but not the glandular structures.
4. Spread by continuity not by lymphatics [3].

The presenting symptoms of LWA is bilateral swelling of submandibular space, high fever, odynophagia, trismus and dyspnoea, on examination the swelling is highly tender on palpation and woody hard feeling [4]. Dental carries and infection account for 80% cause for LWA. Usually 2nd and 3rd lower molar teeth are most vulnerable as they are near to the mylohyoid muscle attachment area of mylohyoid ridge [5]. Other etiological or predisposing factors include diabetes mellitus, history of recent dental treatment as a source of infection, malnutrition, immunocompromisedpatient, older age and oral malignancy [6]. The process of pathophysiology is expedited by floor of the mouth in which infection starts from carries molar teeth and spread to sublingual space through the posterior part of mylohyoid muscle provoke edema to sublingual space and pushing the tongue upwards and backwards is sufficient to suffocate the patient [7].Bacteriology shows both aerobic and anaerobic organisms like Alpha-hemolytic Streptococci, Staphylococcus aureus, Bacteroids and Peptostreptococcus rarely Haemophilusinfluenza, Escherisia Coli or Pseudomonas is seen [8]. All ages are susceptible for LWA, but 5th decade and above are more vulnerable to it [9]. The presenting features depend on the time after starting the disease process when the patient feel throat pain and submandibular swelling. Actually patient come to the ENT physician at late stage when develop trismus, odynophagia, difficulty in respiration, submandibular huge swelling display them as a 'Bull Neck' or double chin appearance. The patient may be developed hot potato or muffled voice. The aim of treatment is to quick relief of airway obstruction by decompressing the immense edematous swelling with giving a large horse shoe shaped incision from angle of one mandible to angle of another mandible and drainage of pus, infected

serous fluid and removal of all devitalized tissue and giving loose dressing to soaked out of infected fluids and starting broad spectrum parenteralintravenous combined systemic antibiotics such as Inj. Meropenem, Clindamycin, Metronidazole to combat both aerobic and anaerobic bacteria [10]. At the same time regular surgical dressing to freshening the wound by removal of necrotic tissue. Small ribbon pack or corrugated rubber sheet was given to continuous drain out the pus and fluid.

Our aim of study is to find out the relative frequency, etiological factor, preventive measure of LWA and developing possible awareness of the distress community to reduce the morbidity and mortality of the patient.

Methods and Materials

It is a cohort retrospective study of 193 cases of LWA in the department of Otorhinolaryngology and Heak-Neck Surgery, Comilla Medical College, Bangladesh from 01 July 2016 to 31 June 2019. During these three years period 30525 patients had got admitted in the inpatient department with various disease entity in which casualty were 4019. Out of these patients LWA patient were 193, incidence of which was calculated by using the statistical software of SAS. All 193 patient were clinically diagnosed as LWA and confirmed by history, examination and investigation. Practically maximum patient came with severe pain, odynophagia, difficulty in respiration and floor of mouth was swollen up to the edge of upper margin of lower teeth and tongue pushed back to close the aerodigestive pathway. So without delay incision and drainage was given with splitting the mylohyoid muscle to decompress the swelling and immediate relief the airway obstruction. Investigations were included complete blood count, blood sugar, serum electrolytes, immunoglobulin and OPG. The following data were collected: age, sex, personal habit, residence, presenting feature, post-operative follow up and complications.

Result

During these three years period 30525 patient had got admitted in inpatient department in which LWA were 0.63% and out of 4019 casualties LWA were 4.80% (Figures 1 and 2). Among gender epidemiology male were 157(81.34%) and female were 36 (1.66%) (Figure 3). Age allocated children were 7 (3.62%) (According to WHO and UNICEF children age up to 18 yrs) amid them 3 were autistic who had bad oral hygiene and infected oral mucosa, 2 were dental caries and infection and rest 2 were infected lymph nodes, 18-40 yrs were 13 (6.73%) and above 41 yrs were 173(89.65%) in which lowest age were 2 yrs and highest one was 81 yrs with mean age were 52.24 yrs (Figure 4). Personal habit (Figure5) of tooth cleaning 167(86.52%) were used charcoal those maximum were slum dwellers and Villagers, rest 26 (13.48%) were used tooth paste and brush. Amidst them 149(77.20) were smoker and non-smoker were 44(22.80) whereas betel leaf and nut chewer were 114(59.06%) in which maximum female were abuse it, fortunately 79(40.94%) were avoiding it. Residence exhibits (Figure 6) the (55.44%) 107 were slum dwellers,(40.41%) 78 were villagers and only (4.15%) 8 were living in town. Predisposing factors (Figure 7) revealed that 169 (87.56%) were diabetic and rest 24 (12.44%) were non diabetic. OPG findings displayed dental carries were 181(93.78%) and 12(6.22%) had normal teeth but poor oral hygiene. During the preliminary period of disease the patient were treated by local quack or village doctor. When the patient developed severe pain, odynophagia, trismus, swelling increasing rapidly and difficulty in respiration they were get admitted in hospital for proper treatment. Without delay we

were giving a horse shoe shaped incision from one mandible to another mandible and draining out all pus, necrotic and gangrenous tissue and everyday surgical dressing and cleaning all devitalized tissue followed by combined broad spectrum antibiotic, maintaining fluid and nutrition balance by high protein diet to improve nutritional status. 5(2.59%) patient had multiple focus of infection in upper chest, face and head which were also incision and drainage were done separately. The treatment response were variable about the condition of the patient and may be prolonged the hospital tarry (Figure 8). 58(30.05%) patient were stayed in hospital up to 4 weeks, 79(40.95%) patient were stayed up to 4 to 6 weeks and rest 56(29%) were tarried in hospital more than 6 weeks. Amid them 4(2.07%) patient were died (Figure 8) in which 1 patient were died due to carotid blow out and 3 patient were died due to immunodeficiency disorder, uncontrolled diabetes and septicemia.

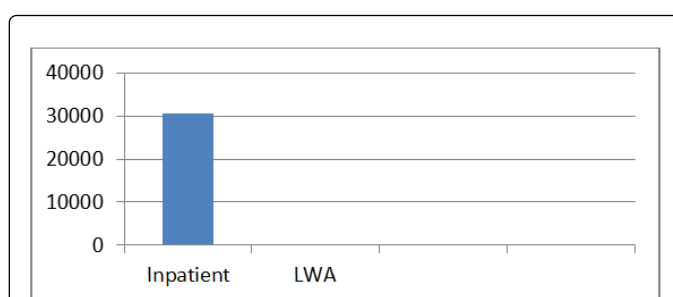


Figure 1: Incidence of LWA in total inpatient admission. (N-30525; LWD-193:0.63%)

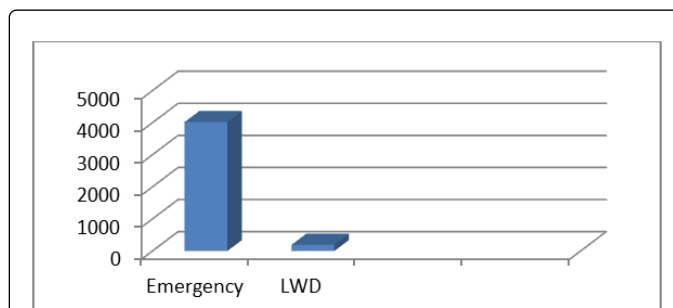


Figure 2: Incidence of LWD in total ENT casualty. (N-4019; LWD-193:4.80%)

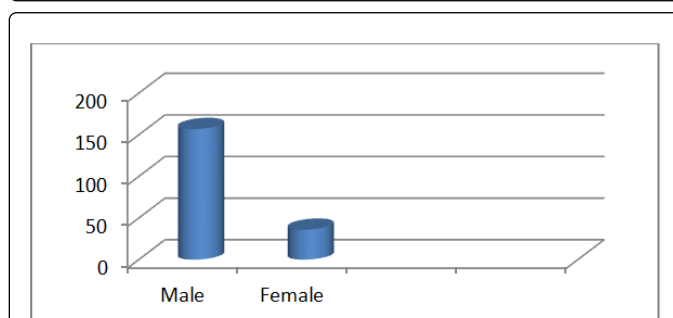


Figure 3: Gender epidemiology. (N-193; Male-157; Female-36)

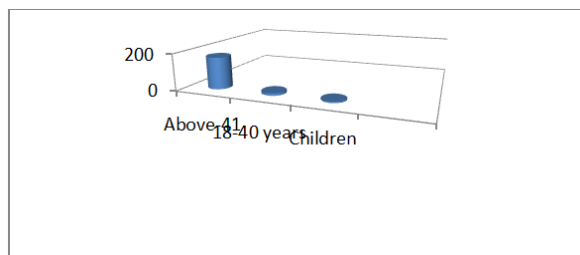


Figure 4: Age allocation.
(N-193; Children-7:18-40 years-13: 41 above-173)

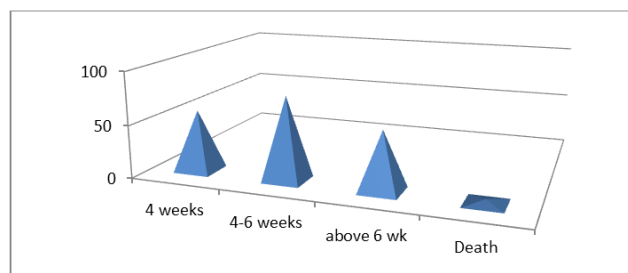


Figure 8: Hospital tarry and death.
(N-193; 4 weeks-58: 4-6 weeks-79: Above 6 weeks-56:Death-4)

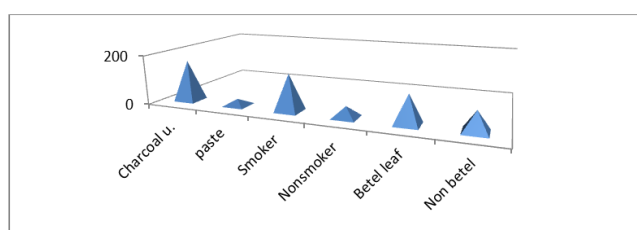


Figure 5: Personal habit.
(N-193; charcoal-167:paste-26:smoker-149:non-44:betel-114:non-79)

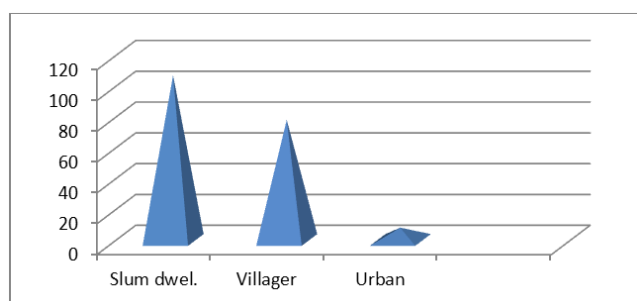


Figure 6: Residence.
(N-193; Slum dwellers-107:Villager-78:Urban-8)

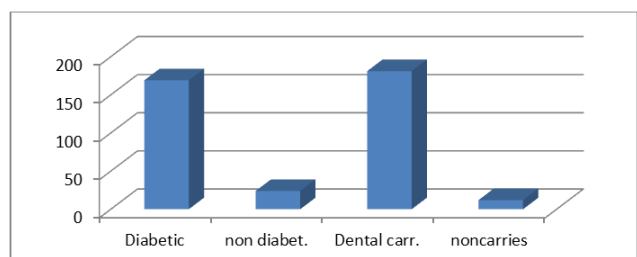


Figure 7: Predisposing factor.
(N-193;Diabetic-169:Non-24:Dental carries-181:Non-12)

Discussion

The LWA is a very fatal infection of the throat and floor of mouth around the aerodigestive pathway. So treatment must be more aggressive and started without any delay after taking high risk bond from the patient attendant and relative. We relieved the aerodigestive obstruction by decompression of the swelling with incision and drainage of pus and infected fluid and at the same time starting broad spectrum combined parenteral antibiotic which was supported by Kuriyama T. et al. study [11]. In our study male were predominant near about 4th time more than female such as supported by Patterson HC et al. series [12]. In our series most susceptible age were 5th decade and older that one also keep up by Biswas D et al. series [13]. Some series of study displayed that the disease occurred more in 4th decade [14].

The poor dental hygiene, uncontrolled diabetes, slum dwellers who were suffered from malnutrition, smoker and betel leaf and nut chewer were more risk to suffer from LWA which were reinforce by Lepelletier D et al. study (Figure 9-11) [15].



Figure 9: Picture of incision and drainage of a LWA patient.



Figure 10: Picture of multiple focus of infection of LWA with incision and drainage.

The regular surgical dressing is most important, even two times a day whatever we were doing for severe infected cases, if it wasn't regular the infection spread to multiple site like chest, mediastinum, cheek and head whichever keep up by Snow N, et al. series [16]. We used combined broad spectrum parenteral antibiotic like injection Meropenem, Clindamycin and Metronidazole worked against both aerobic and anaerobic microbes that was used by Brook I series of study [17]. We treated the all patient following stepwise: A. Aggressive and appropriate surgical incision and drainage. B. Meticulous debridement. C. Excision of all necrotic tissue. D. Regular surgical dressing sometimes two times daily for severe ill patient for total cleanliness of wound area whichever followed by Vallee M. et al. series [18]. In our study death were 2.07% (4) whereas in 2000 Whitesides et al study reported death were 50% or more [19]. Bansal et al. series of study reported after revolutionary invention of antibiotic decreasing the mortality rate abruptly to 8% [20]. This was another reflection of our study that Bangladesh is one of the bigger country of Pharmaceutical manufacturer of latest drugs that is available and cheap can be continue the treatment prolonged period by the poor patient also. It is more encouraging that our young doctors and other health staffs are working so hard to conquer against these pessimistic disease and monstrous bacteria to save the hundreds of life.



Figure 11: Another picture of multiple focus of infection of LWA with incision and drainage.

Conclusion

LWA is one of the fatal dreadful diseases which can commonly strike the old, immune compromised patient, diabetes, slum dwellers and villagers who weren't aware about the oral and dental hygiene. So development of perception and knowledge of this community about their immaculateness particularly about dental care is important to restrain the disease and creating heart-felt smiling of the patient and mitigate the hospital tarry outstanding.

Ethical approval

The study was approved by the Institutional Ethics Committee.

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