

A Study on 120 Cases of Deep Neck Space Infections in Tertiary Care Centre

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Abstract: Even in era of antibiotics deep neck space infections are frequently encountered. A retrospective study of 120 patients admitted in regional institute of medical sciences, Imphal, during period of Jan 2013- Dec 2015 was done. A total number of 120 patients were admitted in ENT ward of male were 69(57.5%) and female 51(42.5%) with ratio of 1.35. the most common age group affected were between 31-40 years which accounts 37 patients(30.3%) with youngest being 2 years old and oldest 81 years. Ludwig angina with 53 patients(44.6%) was the most common infection, streptococcus group with 28 patients (23.3%) being the most common organism. Various antibiotic regimens were used for treatment based on infection and bacteriological studies. One patient died and one needed tracheostomy.

Keywords: antibiotics, deep neck space infection (DNSI), Ludwig angina, and tracheostomy.

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I. Introduction

Deep Neck space infection (DNSI) refers to an infection in the potential spaces and fascial planes of the neck, either with abscess formation or cellulitis. Although the incidence of fatal neck infections has decreased with the advent of broad spectrum antibiotics, it still remains serious and is associated with significant morbidity.¹

The anatomical proximity of the cervical fascial spaces to common sites of infections in the head and neck made them vulnerable during upper respiratory infections, tooth infections, infections originating in pharynx and tonsil before antibiotics era. Since the advent of antibiotics, the oropharyngeal infections are no longer a significant etiological factor but dental infection and regional trauma are still common cause.²

The deep neck spaces that run entire length of neck include the retropharyngeal space, the danger space, the prevertebral space and the visceral vascular space. The spaces limited to above the hyoid include the submandibular space, the parapharyngeal space, the peritonsillar space, the masticator space, the temporal space and the parotid space. The only potential space limited to below the hyoid is the anterior visceral space. This area is enclosed by the middle layer of the deep cervical fascia and contains the thyroid gland, esophagus and trachea.³⁻⁶

Deep Neck space infections are usually polymicrobial in nature. Streptococci, Staphylococcus aureus, and anaerobes are the most commonly cultured organisms for neck space infection.

The common clinical features include swelling in neck, pain tenderness, fever, dysphagia, respiratory distress and signs of toxemia. Sometimes neck space infection may even lead to mediastinitis, internal jugular vein thrombosis and brain abscess.

Treatment includes antibiotic therapy, incision and drainage, airway management and surgical intervention. The study was aimed at identifying the aetiological, bacteriological study, treatment regimen and complications of neck space infection.

II. Materials and Methods

In this retrospective study, 120 patients who were admitted and treated for neck space infection in ENT department, Regional institute of medical sciences, Imphal, from Jan 2013 to December 2015 were included. Deep neck space infection due to any malignancy was excluded. Patients of all age groups and both genders were included. All parameters including age, sex, co-morbidities, site involved, bacteriological study, treatment regimen, complications, and outcome were studied. All patients were initiated on treatment with ceftriaxone sulbactam and metronidazole; the treatment regimen was later modified based on a culture and sensitivity report.

III. Results

Table 1: Sex wise distribution (n=120)

Sex	male No. on patients	total
Male	69	120
Female	51	

Out of 120 inpatients, 69 were male (57.5%) and 51 (42.5%) were female with male: female ratio of 1.3.

Table 2: Age wise distribution (n=120)

Age	No. of patients		
	Male	female	Total
0-10	3	1	4
11-20	10	7	17
21-30	8	5	13
31-40	18	19	37
41-50	10	8	18
51-60	10	5	15
61-70	7	5	12
71-80	2	1	3
81-90	1	0	1
Total	69	51	120

The mean age of the patients was 35.5 years, with a minimum age of 2 months and a maximum age of 81 years. The majority of patients were in the 31–40-year age group, followed by the 41–50-year age group.

Table 3: Types of infection (n=120)

Disease		No. Of patient		Percentage
		Male	Female	
Submandibular space	Cellulitis	19	13	42.5
	Abscess	9	10	
Ludwig angina	Cellulitis	18	15	44.16
	Abscess	15	5	
Parotid space		1	2	2.5
Parapharyngeal space		4	5	7.5
Retropharyngeal space		2	1	2.5
Bezold's abscess		1		0.83
Total		69	51	100
		120		

Ludwig angina contributed majority of cases with 52 patients contributing 44.16 percent followed by submandibular space infection contributing 51 patients (42.16). Others were parapharyngeal spaces, retropharyngeal spaces, parotid space and bezold's abscess contributing 4(7.5%), 2(2.5%), 2(2.5%) and 1 (0.83%) respectively

Table 4: Bacteriological study (n=120)

Organisms	Total number	Percentage
Streptococcus	28	23.3
Staphylococcus	24	20
Polymicrobial	20	16.67
Anaerobes	10	8.3
Klebsiella	9	7.5
E.coli	6	5
Pseudomonas	6	5
No bacterial growth	17	14.16
Total	120	

Bacteriological study of 120 patients showed streptococcus bacilli to be the most common causative organism contributing 28 patients (23.3%) followed by staphylococcus, polymicrobials, anaerobes, klebsiella, E.coli and pseudomonas with 24(20%), 20(16.67%), 10(8.3%), 9(7.5%), 6(5%) and 6 (5%) patients respectively. Out of 120 patients, 17 (14.16%) didn't show any bacterial growth.

Table 5: Co-morbid conditions

Disease	Total no. of patients		
	Male	Female	Total
Diabetes mellitus	8	5	13
Tuberculosis	1	2	3
Hiv positive	2	3	5

Out of 120 patients, 13 patients were suffering from diabetes mellitus, 3 patients were having tuberculosis and 5 patients were suffering HIV positive respectively.

Table 6: Antibiotics regimen

Treatment regimen	No. of patients		Total
	Male	Female	
Amoxicillin clavulanic acid + metronidazole	2	3	5
Ceftriaxone sulbactam + metronidazole	25	20	45
Ceftriaxone sulbactam+ tinidazole	2	1	3
Cefeperezonesulbactam+ metronidazole	21	17	38
Cefeperezonesulbactam + tinidazole	4	1	5
Piperacillin tazobactam+ metronidazole	10	5	15
Piperacillin tazobactam +tinidazole	2	1	3
Linezolid	1	0	1
Ofloxacin+ metronidazole	1	1	2
RNTCP	1	2	3
Total	69	51	120

*RNTCP= Revised national Tuberculosis control program.

Incision and drainage was done whenever necessary. Majority of patients were treated with ceftriaxone sulbactam with metronidazole followed by cefeperezonesulbactam with metronidazole. Other intra-venous drugs used were piperacillin tazobactam, Tinidazole, Linezolid, Ofloxacin and RNTCP regimen.

Table 7: Complications

Complications	No. of patients
Cerebral abscess	1
Tracheostomy	1
Death	1

Out of 120 patients, 1 patient had cerebral abscess as complication, 1 patient required tracheostomy and 1 patient died during the course of treatment.

IV. Discussion

The advent and widespread use of antibiotics has decreased the incidence of Neck Space Infection, but it remains a fairly common problem. In our study, 120 Neck Space Infection patients were admitted to the hospital for treatment. The majority of patients were seen in their 3rd and 4th decade of life. This correlates with the studies by Parischaret al⁷ and Meher et al⁸ in which 50% and 60% patients were in the third and fourth decade of life respectively. In our study, a male predominance was seen, which is consistent with studies by Sethi et al and Parischar et al. Further, in our study, diabetes was associated with 10.8% patients, which is very low compared with the study of Huang et al⁹ which reported 30.3% patients of diabetes mellitus. The most common presentation of Neck Space Infection in our study was Ludwig's angina (44.16%), followed by submandibular abscess (42.5%), parapharyngeal abscess (7.5%), and retropharyngeal abscess (2.5%) which is consistent with the studies by Khode et al¹⁰ with about 60% cases with a similar presentation. Submandibular abscess were the second most common presentation in our study, which correlates with study results from Pariscar et al and Stalfor et al¹¹ with peritonsillar and submandibular as the second and third most common presentation.

Streptococcus species were the most common cultured organism in our study, which is consistent with the studies of Ridder et al¹², Parischar et al, Mumtaz et al¹³ and Gidley et al¹⁴ In 17 patients (14.17%), no organism was cultured, which was probably due to use of antibiotics at the time the cultures were sent.

Management of neck space infection usually involves early surgical drainage of purulent abscesses via an external incision. In our study, all patients were initiated on intravenous antibiotic therapy with ceftriaxone sulbactam, and metronidazole, which was later modified according to the culture and sensitivity report.

Airway management is challenging in patients with neck space infection. In our study, tracheotomy was performed in one patient (0.08%) of cases, which is lower than the study by Eftekharian et al¹⁵ in which tracheotomy was required in 8.8% cases.

V. Conclusion

Neck space Infection remains a common and challenging disease for clinicians, and should be treated on emergency basis. It is also very important to give special attention to high-risk groups such as diabetics, the elderly, and patients with underlying systemic diseases as the condition may progress to life-threatening complications. Early diagnosis and treatment is essential. Thus, all patients should be initiated on treatment with empirical intravenous antibiotic therapy, which should be updated later according to the culture and sensitivity report. Tracheotomy should be considered if airway protection is needed. In developing countries, lack of adequate nutrition, poor oral hygiene, tobacco chewing, smoking and beetle nut chewing has led to an increased prevalence of dental and periodontal diseases.

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