



STUDY OF DEEP NECK SPACES INFECTION AT KATIHAR MEDICAL COLLEGE AND HOSPITAL

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ABSTRACT

Background: Deep Neck Space Infections (DNSI) implies infection in the potential spaces either with abscess formation or with cellulites. Antibiotics usage at adequate strength and duration has brought a significant decrease in the occurrence and progression of the disease. These infections are severe and inadequate treatment may lead to progression and can be associated with high morbidity and mortality. aim of the study was to find out prevalence, predisposing factors and changing trend of deep neck spaces infection in this broad spectrum antibiotics era. **Methods:** This prospective study was carried out at katihar Medical College and Hospital. 90 Patients were studied who came with deep neck space infection who were treated in the department of ENT, katihar medical college and Hospital. **Results:** In this study majority of patient were in the age group of 41-60 year. Odontogenic and oropharyngeal infection are the most common etiologies. Staphylococcus aureus, Streptococcus, E. coli, Klebsiella and anaerobes were the microorganisms commonly isolated in pus culture and sensitivity test. **Conclusions:** The deep location and complexity of this region makes the diagnosis and treatment of these infections challenging.

KEYWORDS

Deep neck space infections, Submandibular, Parapharyngeal space, Neck abscess

INTRODUCTION

Deep Neck Space Infections (DNSI) implies infection in the potential spaces either with abscess formation or with cellulites. In the past the incidence of DNSI were more common, the advent of broad spectrum antibiotics has significantly brought down the incidence of these infections [1]. DNSI are bacterial infections originating from the upper aero digestive tract and involving the deep neck spaces (2). The most common primary sources of DNSI are the dentition, tonsils, salivary glands, foreign bodies, and malignancies. DNSI often occur following preceding infections such as dental caries, tonsillitis, pharyngitis, trauma to the head and neck. Infections originating from teeth or their supporting structures, known as odontogenic infections, are among the most common diseases in the oral and maxillofacial region, especially in developing countries (3). Previously, before the advent of antibiotics, tonsillar and peritonsillar infections were the source of infection in 70% cases of DNSI (4); but now the most common cause is considered to be dental in origin (5). DNSI are usually polymicrobial in nature. Streptococci, Peptostreptococcus species, Staphylococcus aureus, and anaerobes are the most commonly cultured organisms from DNSI (6, 7). Clinical manifestations of DNSI depend on the spaces involved, and include pain, fever, malaise, fatigue, swelling, odynophagia, dysphagia, trismus, dysphonia, otalgia, and dyspnea (8). Despite the extensive use of antibiotics, DNSI still remains serious and is associated with significant morbidity. These infections are potentially life threatening and spread rapidly, leading to severe complications. Treatment of deep neck spaces infection include removal of primary source of infection particularly in odontogenic infection where root canal treatment or dental extraction is required in addition to broad spectrum antibiotic therapy, airway management, incision and drainage in case of abscess and nonsurgical treatment by appropriate antibiotics in case of cellulitis (9).

METHODS

We have done prospective study in 90 patients who came with Deep neck spaces infection who were treated in the department of ENT, katihar medical college and Hospital, Katihar from December 2018 to November 2019. We have included patients of all age group and both gender. All patients with deep neck spaces infection admitted in hospital were properly examined and managed accordingly. In patient with abscess formation incision and drainage was done. Drained pus was sent for culture sensitivity and acid fast bacilli examination. All patients with or without abscess formation were also treated by available broad spectrum antibiotics. Daily or alternate day dressing depending upon pus collection and healing status with beta dine, hydrogen peroxide, metronidazole solution was done depending upon the case. Antibiotics were changed according to pus culture sensitivity report later on. All the data in term of age, sex, clinical presentation, etiology, investigation, blood investigation, pus culture, treatment, complication and outcome were analysed.

RESULTS

Table 1: Age and sex distribution of patients

Age (in years)	No of patients		Percentage (%)
	Male	Female	
1-10	10	6	17.78
11-20	4	1	5.56
21-30	3	1	4.44
31-40	8	4	13.33
41-50	13	9	24.44
51-60	15	8	25.56
61-70	3	2	5.56
71-80	2	1	3.33
Total	58(64.44%)	32(35.56)	100

Total 90 patients were evaluated in this study. As shown in Table 1, 58 patients (64.44%) were male and 32 patients (35.56%) were female. Most commonly affected age groups were between 41-60 years involving 45 (50%) followed by 16 patients (17.78%) were less than 11 years.

Table 2: Symptoms of deep neck spaces infection

Symptoms	Number of pt	Percentage (%)
Pain	86	95.56
Neck swelling	85	94.44
Fever	72	80
Trismus	58	64.44
Toothache	46	51.1
Odynophagia	27	30
Dysphagia	13	14.44
Airway difficulty	11	12.22

Almost all patients were presented with chief complain of pain in neck (95.56%) and neck swelling (94.44%). Others symptoms were fever (80%), trismus (64.44%), toothache (51.1%), odynophagia (30%), dysphagia (14.44%) and airway difficulty (12.22%).

Table 3: Etiology

Etiology	No of patients		Total	Percentage (%)
	Male	Female		
Odontogenic	30	16	46	51.11
Tonsillitis	11	5	16	17.78
Salivary gland infection	10	5	15	16.67
Infected lymphnode	3	6	9	10
Foreign body	2	0	2	2.22
Infected cyst	2	0	2	2.22
Total	58	32	90	100

The most common cause of deep neck abscess in our study was

Odontogenic (51.11%), followed by tonsillitis (17.78%). Out of 16 patients with tonsillitis, 13 patients developed peritonsillar abscess. Salivary gland infection was seen in 15 (16.67%) cases. Infected lymph nodes were the cause in 9 (10%) patients. Less common causes include foreign body in posterior pharyngeal wall in 2 (2.22%) patients who developed retropharyngeal abscess and infected cyst (2.22%).

Table 4: Site of involvement

Location	Number of pt	Percentage (%)
Submandibular space	52	57.78
Parapharyngeal space	15	16.67
Parotid space	9	10
Retropharyngeal space	2	2.22
Anterior /posterior triangle of neck	9	10
2 or more space involved	3	3.33
Total	90	100

Involvement of neck spaces was diagnosed by clinical examination and radiological investigations like X-ray neck, ultrasonography, CT scan. Involvement of submandibular space was in 52 patients (57.78%), followed by parapharyngeal space 15 (16.67%), parotid space (10%), retropharyngeal space (2.22%), anterior/posterior triangle of neck (10%), two or more spaces involved (3.33%).

Table 5: Organism isolated

Organism	Number of Pt	Percentage (%)
Streptococcus species	30	33.33
Anaerobes	12	13.33
Staph aureus	9	10
Klebsiella	4	4.45
Tubercular bacillus	5	5.56
Pseudomonas aeruginosa	3	3.33
No growth of pathogen	27	30
Total	90	100

The most common organism isolated were Streptococcus (33.3%) followed by anaerobes (13.33%), Staphylococcus (10%), Klebsiella (4.45%) and Pseudomonas (3.33%). M. tuberculosis was found in 5 (5.56%) cases. No organisms were isolated in 27 (30%) cases.

Table 6: Co morbid conditions

Comorbid condition	Number of pt	Percentage (%)
Anaemia	36	40
Diabetes mellitus	18	20
Renal failure	4	4.44
PLHA	2	2.22

60 patients have associated co morbid conditions like anaemia 36 (40%), diabetes mellitus 18 (20%), renal failure 4 (4.44%), PLHA 2 (2.22%). These co morbid conditions were also treated accordingly.

DISCUSSION:

The diagnosis and management of deep neck spaces infection is still a challenge for otolaryngologist. Deep neck spaces infections are severe in cases with co morbid condition like poor nutrition, anaemia, diabetes, renal failure immune compromised condition, etc. Evaluation of this life threatening conditions is very important. In this study, 90 patients with deep neck spaces infection were studied and data was analysed. The study reveals affection of all age group patients commonly affected age group being 1-10 and 41-60 years. Maximum numbers of cases were found in the age group of 41-60 years. Mean age of affected patients was 38.67 and is similar to other studies were mean age varied from 36 to 57 years (10, 11). Men (64.44%) were affected more than women (35.56%). In study done by Kataria et al and Sharma et al 55.26% males and 44.74% females and 71.11% males and 28.89% females affected respectively which is similar to our study (12, 13). Out of 90 cases of deep neck spaces infection forty six (51.11%) were Odontogenic in origin. This is followed by tonsillitis 16 (17.78%), salivary gland infection 15 (16.67%), infected lymphadenopathy in 9 (10%), infected cyst 2 (2.22%) and foreign body 2 (2.22%). In studies done by Parhiscar et al 43% of deep neck spaces infections were odontogenic in origin (10). Among these 46 patients, 30 were males and 16 were females. Which is comparable with Parhiscar et al, Kataria et al (10, 12). This may indicate that men pay less attention to oral hygiene as well as having habit of smoking and pan masala in our region.

Most of patients presented with neck pain 86 (95.56%), swelling

85 (94.44%), fever 72 (80%), trismus 58 (64.44%) and toothache 46 (51.1%) along with odynophagia 27 (30%), dysphagia 13 (14.44%) and airway difficulty 11 (12.22%). This is comparable with study done by Thimmappa et al (14). Commonest presentation in our study of deep neck spaces infection was submandibular abscess (57.78%) followed by parapharyngeal abscess (16.67%), parotid abscess (10%), anterior/posterior triangle of neck (10%), and retropharyngeal abscess (2.22%). Submandibular abscess is the most common presentation in studies done by Parhiscar et al with 28% (10). Pus drained from abscess was sent for culture and sensitivity test in every patients. Later antibiotics were modified according to sensitivity report. In this study organisms isolated are Streptococcus 30 (33.33%), Anaerobes 12 (13.33%), Staphylococcus aureus 9 (10%), M. tuberculosis 5 (5.56%), Klebsiella 4 (4.45%) and Pseudomonas aeruginosa 3 (3.33%). Organism could not be isolated in 27 patients (30%). This may be due to liberal use of antibiotic before surgical drainage of the abscess. In studies done by Parhiscar et al and Kataria et al the most common organism isolated was Streptococcus being 39% and 23.8% (10, 12).

CONCLUSIONS

The deep location and complexity of this region makes the diagnosis and treatment of these infections challenging. Its presentation may be masked and bacterial cultures may not be conclusive but it still needs early diagnosis and prompt management. Inadequate nutritional status, poor oral hygiene and lack of awareness in dental health are common predisposing factors for deep neck spaces infection.

REFERENCES

- Wang LF, Kuo WR, Tsai SM, Huang KJ (2003) Characterizations of life threatening deep cervical space infections: A review of one hundred ninety six cases. *American J Otolaryngol* 24: 111-117.
- Durazzo M, Pinto F, Loures M, Volpi E, Nishio S, Brandao L, et al. Deep neck space infections. *Rev Ass Med Brasil*. 1997;43:119-26.
- Wong TY. A nationwide survey of deaths from oral and maxillofacial infections: the Taiwanese experience. *J Oral Maxillofac Surg*. 1999;57:1297-99.
- Weed H, Forest L. Deep neck infection. *J Otolaryngol Head Neck Surg*. 1998;3:2515-24.
- Parhiscar A, Harel G. Deep neck abscess: A retrospective review of 210 cases. *Ann Otol Rhinol Laryngol*. 2001;110(11):1051-54.
- Ungkanont K, Yellon RF, Weissman JL, Casselbrant ML, Gonzalez VH, Bluestone CD. Head and neck space infections in infant and children. *Otolaryngol Head Neck Surg*. 1995;112(3):375-82.
- Huang TT, Liu TC, Chen PR, Tseng FY, Yeh TH, Chen YS. Deep neck infection: Analysis of 185 cases. *J Otolaryngol Head Neck Surg*. 2004;26(10):854-60.
- Hasegawa J, Hidaka H, Tateda M, Kudo T, Sagai S, Miyazaki M, et al. An analysis of clinical risk factors of deep neck infection. *Auris Nasus Larynx*. 2011;38(1):101-7.
- Mayor GP, Millan JMS, Martinez VA. Is conservative treatment of deep neck space infections appropriate? *J Head Neck*. 2001;23:126-33.
- Parhiscar A, Harel G. Deep neck abscess: a retrospective review of 210 cases. *Ann Otol Rhinol Laryngol*. 2001;110:1051-4.
- BehuSj, Shubuya TY, Meleca RJ, Mathog RH, YooGh, et al. Cranio cervical necrotising fasciitis- An 11 years experience. *Otolaryngol Head Neck Surg*. 2001;125:245-52.
- Kataria G, Saxena A, Bhagat S, Singh B, Goyal I, Vijayvergia S, et al. Int J Otorhinolaryngol Head Neck Surg. 2015;1(1):11-6.
- Sharma S, Das D, Joshi M, Burman D, Sharma AJ. Deep neck spaces infection-A study in diabetic population in tertiary care centre. *Indian J Otorhinolaryngol Head Neck Surg*. 2018;70(1):22-7.
- Thimmappa TD, Ramesh S, Nagraj M, Gangadhara KS. *Int J Otorhinolaryngol Head Neck Surg*. 2017;3(1):116-21