

DEEP NECK SPACE INFECTIONS A RETROSPECTIVE STUDY

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ABSTRACT

Background: Deep neck space infections (DNSI) mostly present a true clinical challenge. Though the use of antibiotics has decrease the incidence but DNSI remain a leading public health problem.

Objective: To evaluate deep neck space infections among patients.

Method: It was retrospective study in which 50 patients with DNSI admitted in ENT Department of Lahore General Hospital, Lahore, from June 2016 to April 2019 were included. All the parameters such as gender, age, symptoms, etiological factors and location of abscess were studied.

Results: Among 50 patients, 66.0% were males. 90.0% patients had neck pain, 86.0% neck swelling, 82.0% dysphagia and 76.0% fever. Among these patients, 36.0% had odontogenic infection and 50.0% had ludwig's angina.

Conclusion: Deep neck space infections were more prevalent among males and the most common symptoms were neck pain, neck swelling, dysphagia, fever and odyphagia. Odontogenic infections were most frequent etiological factor and Ludwig's angina was very common presentation of DNSI.

Keywords: DNSI, symptoms, etiology, abscess, location.

INTRODUCTION

Deep neck space infection is the infectivity in potential gaps and facial planes of neck, either with cellulitis or abscess formation.^[1-3] At least eleven deep spaces shaped by facial planes are the part of complex structure, they make potential infectivity locations and based upon their association with hyoid bone.^[4] The classification of deep neck spaces is as under: Gaps localized over hyoid level: submandibular, peritonsillar, parotid, buccal, parapharyngeal, temporal/masticatory; Gaps involving complete border of the neck: prevertebral, carotid and retropharyngeal; and pretracheal or anterior visceral gap below the hyoid.^[5]

During life, DNSI can appear at any stage and is believed a significant disorder which mostly spreads to several other body organs and has fatal consequences.^[6] Deep neck space infections are recognized to have considerable mortality and morbidity. Death rates caused by DNSI are observed between 1.6-7.6 percent.^[7]

The leading causes of deep neck space infections are tonsils and dentition, other reasons could be due to foreign bodies, malignancies and salivary glands. Generally, infections caused by DNSI such as tonsillitis, dental caries, trauma to neck and head and i/v drug abusers. Among developing states, odontogenic infectivity is a significant cause. Prior to antibiotic

period, tonsil as well as peritonsillar area were the common cause of infectivity in about 70 percent DNSI cases, however, currently dental origin is believed most important source. Odontogenic contagions such as periapical lesions with bacterial invasion and pulp necrosis into periodontal lesions and periapical tissues related to periodontal pockets lead to deep neck space infections.^[8]

With regard to DNSI bacteriology, the frequent organisms concerned are *S. aureus*, Streptococci, anaerobes and Peptostreptococcus species. Generally these are polymicrobial.^[9]

Clinical signs and symptoms of deep neck space infections depend upon gaps involved, and comprise fever, fatigue, pain, malaise, odyphagia, trismus, dysphagia, swelling, otalgia, dyspnea and dysphonia.^[10]

A quickly progressive DNSI course with lethal outcome could be observed, particularly among immunocompromised patients on steroid therapy, chemotherapy, HIV infection and diabetic patients. These contagions were most common in the past, though, with the arrival of wide ranged antibiotics, frequency of such infections has reduced. In spite of antibiotic significant use, SNSI are still believed serious problems and linked with considerable morbidity. The deep neck space infections spread rapidly and are life threatening, causing grave complications. Serious life-threatening problems have been recorded to happen at

10 to 20 percent rate, even in current literature regarding DNSI cases.^[11]

Potentially and common life-threatening difficulties comprise airway impediment, descending mediastinitis, jugular vein thrombosis, severe respiratory distress disorder, sepsis, disseminated intravascular coagulation, empyema, septic arthritis and septic pulmonary emboli.^[12]

Failure to timely identify DNSI could be caused by a changed medical practice resulting from antibiotics misuse, frequency of immunodeficiency patients, modifications in DNSI origins and bacteriology.^[13,14]

For the diagnosis, antibiograms and cultures should be taken for the identification of microorganism and for proper antibiotic treatment. Ultrasonography is believed a valuable diagnostic method regarding liquefactive abscess. Among complicated patients and deeply situated contagions, computerized tomography is recommended.^[15]

Deep neck space infections treatment comprises antibiotic therapy, surgical treatment and airway management. Traditionally, the DNSI management is based upon quick surgical drainage of abscess then nonsurgical and antibiotics treatment utilizing proper antibiotics in case of cellulitis.^[11]

Well-timed diagnosis and appropriate planning regarding treatment can save the life of patient and avert the complications caused by the disease.^[16]

Current study aims to evaluate deep neck space infections among patients visiting ENT Department of Lahore General Hospital Lahore.

MATERIAL AND METHODS

It was retrospective study in which 50 patients admitted in ENT Department of Lahore General Hospital, Lahore, from June 2016 to April 2019 were included. Patients having infection associated with inhalant injuries or caused by any malignancy were excluded. Patients of both genders and aged 10-60 years were included. All the parameters such as gender, age, symptoms, etiological factors and location of abscess were studied. Data was collected through proforma, which was entered into computer software SPSS (Statistical Package for the Social Sciences) version 22.0. Confidentiality of the data was ensured and proper consent was obtained before data collection.

RESULTS

Table-1 exhibits that among 50 patients, 33 (66.0%) were males and 17 (34.0%) were females.

Table-2 indicates that most of the patients 45 (90.0%) had neck pain followed by neck swelling 43 (86.0%), dysphagia 41 (82.0%), fever 38 (76.0%),

odynophagia 38 (76.0%), toothache 18 (36.0%), airway difficulty 5 (10.0%), trismus 4 (8.0%) and torticollis 2 (4.0%).

Table-1: Sex distribution

	Frequency	Percentage (%)
Male	33	66.0
Female	17	34.0
Total	50	100.0

Figure-1: Sex distribution

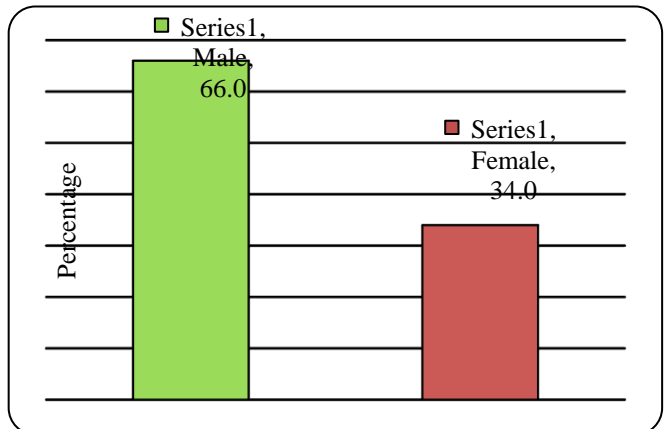


Table-2: Symptoms (n=50)

	Frequency	Percentage (%)
Neck pain	45	90.0
Neck swelling	43	86.0
Dysphagia	41	82.0
Fever	38	76.0
Odynophagia	38	76.0
Toothache	18	36.0
Airway difficulty	5	10.0
Trismus	4	8.0
Torticollis	2	4.0

Table-3: Etiological factors

	Frequency	Percentage (%)
Odontogenic	18	36.0
Tonsillopharyngitis	5	10.0
Infected lymphadenopathy	5	10.0
Trauma	2	4.0
Salivary gland infections	8	16.0
Complicated otitis media	7	14.0
Unknown	5	10.0
Total	50	100.0

Table-4: Location of abscess

	Frequency	Percentage (%)
Ludwig's angina	25	50.0
Submandibular abscess	8	16.0
Parapharyngeal abscess	5	10.0
Retropharyngeal abscess	4	8.0
Parotid abscess	5	10.0
Anterior triangle neck abscess	3	6.0
Total	50	100.0

Table-3 demonstrates the etiological factors of DNSI. Among 50 patients, 18 (36.0%) had odontogenic infection, 5 (10.0%) had tonsillopharyngitis, 5 (10.0%) infected lymphadenopathy, 2 (4.0%) trauma, 8 (16.0%) salivary gland infections, 7 (14.0%) patients had complicated otitis media and 5 (10.0%) were unknown.

Table-4 depicts that out of 50 patients, 25 (50.0%) had ludwig's angina, 8 (16.0%) submandibular abscess, 5 (10.0%) parapharyngeal abscess, 4 (8.0%) retropharyngeal abscess, 5 (10.0%) parotid abscess and 3 (6.0%) had anterior triangle neck abscess.

DISCUSSION

The extensive use of antibiotics has decrease the incidence but deep neck space infections remain a leading public health problem. Present study assessed the deep neck space infections among patients visiting ENT Department of Lahore General Hospital Lahore. To obtain appropriate outcomes, fifty patients were included in the study and found that deep neck space infections were most common among female patients as majority of the patients (66.0%) were males and 34.0% were females. The findings of a study conducted in India by Motahari and coworkers (2015) are almost comparable with our study results who also reported that most of the patients (59.5%) were males and 40.5% were females.^[16] But a recent study undertaken by Arun and George (2018) indicated that majority of the patients (55.0%) were females and 45.0% were males.^[14]

When the symptoms among patients were assessed, study revealed that major proportion of patients (90.0%) had neck pain followed by neck swelling (86.0%), dysphagia (82.0%), fever (76.0%), odynophagia (76.0%), toothache (36.0%), airway difficulty (10.0%), trismus (8.0%) and torticollis (4.0%). A similar study undertaken by Gujrathi and teammates (2016) also demonstrated that massive portion (81.5%) of patients had neck pain followed by neck swelling (77.8%), difficulty in swallowing (39.3%), earache (31.1%), restricted mouth opening

(30.4%), pain while swallowing (28.9%), toothache (24.1%), restricted neck movements (11.9%) and airway difficulty (1.9%).^[10] Another study performed by Santhosh and associates (2017) highlighted that all (100.0%) patients had neck pain, followed by dyspnoea (47.0%), drooling (44.0%), hardness of voice (44.0%), trismus (39.0%), odynophagia (29.0%), swelling (26.0%), fever (17.0%) and dysphagia (15.0%).^[11]

As far as etiological factors of DNSI are concerned, study revealed that most causative factor was odontogenic infection which was prevalent among 36.0% patients while 10.0% had tonsillopharyngitis, 10.0% infected lymphadenopathy, 4.0% trauma, 16.0% patients had salivary gland infections and 14.0% patients had complicated otitis media while 10.0% were unknown. Likewise Gujrathi and teammates (2016) also highlighted in their study that odontogenic infection was prevalent among 24.1% patients while 13.3% had tonsillopharyngitis, 1.5% furunculosis, 21.5% suppurative lymphadenopathy, 10.4% tuberculous lymphadenopathy, 13.3% had salivary gland infections, 5.9% infected cysts, 7.4% had complicated otitis media and 0.4% had foreign body while 2.2 were unknown.^[10]

Study revealed that according to location of abscess, half (50.0%) of the patients had ludwig's angina due to DNSI, 16.0% submandibular abscess, 10.0% parapharyngeal abscess, 8.0% retropharyngeal abscess and 10.0% parotid abscess while 6.0 patients had anterior triangle neck abscess. The findings of the study done by Kataria and fellows (2015) also indicated that majority (28.9%) of patients had ludwig's angina, 18.4% submandibular abscess, 10.5% parapharyngeal abscess, 5.3% retropharyngeal abscess, 2.6% parotid abscess and 2.6% patients had anterior triangle neck abscess.^[11]

CONCLUSION

Study concluded that deep neck space infections were more prevalent among males and the most common symptoms were neck pain, neck swelling, dysphagia, fever and odynophagia. Odontogenic infections were most frequent etiological factor and Ludwig's angina was very common presentation of DNSI. Timely diagnosis and adequate treatment is necessary. Hence, further studies are needed on large scale to assess deep neck space infections among patients.

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