

ORIGINAL ARTICLE

LURKING DANGERS IN DEEP NECK ABSCESS RETROSPECTIVE STUDY

S. Dhanalakshmi¹

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ABSTRACT: AIM: A retrospective study was conducted to identify the predisposing risk factors related with outcome in deep neck infections. **SETTING:** The study was carried out in the Department of ENT, Coimbatore Medical College Hospital, Coimbatore. This is a tertiary referral center hospital. **MATERIALS & METHODS:** The subjects included 85 patients who had inpatient treatment at Coimbatore Medical College Hospital from January 2004 to December 2014. The parameters studied were age, sex, co-morbidity and complications with management.¹⁻² **STATISTICAL ANALYSIS:** The data were analyzed using chi square analysis and logistic regression analysis.³ **RESULTS:** The case sheets of 85 patients were analyzed which included 67 men and 18 women. Among these, 83% had co-morbidity and 20% had dental infection. Most common space involved was submandibular space infection (Ludwig's angina). Female patients with risk factors developed complications. The therapeutic was success achieved only with empiric antibiotics in all patients without complications. Surgical procedures were lifesaving in patients with complications.⁴⁻⁶ **CONCLUSION:** High risk patients need priority attention which includes early treatment with broad spectrum intravenous (iv) antibiotics with surgical drainage or dental extraction or with both or with or without tracheostomy. Empiric antibiotics are effective with minimal disease.

KEYWORDS: Neck abscess, Deep neck space infection, Cervical necrotising faciitis.

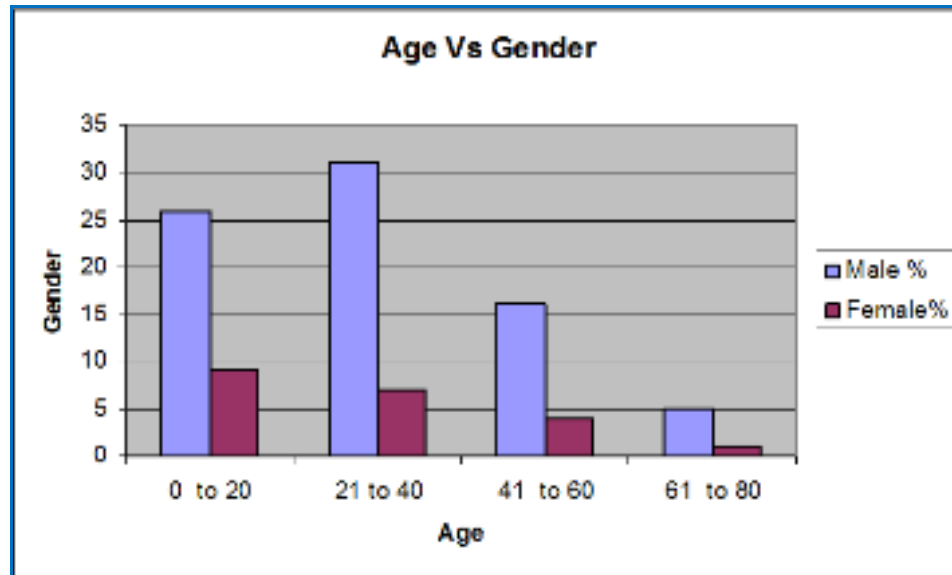
INTRODUCTION: Outcome of deep neck space infections continue to be associated with severe illness and death. Retrospective studies are warranted related to deep neck space infection with etiology, associated co-morbidity, and clinical radiological diagnosis versus microbiology, life threatening complications, treatment and duration of hospital stay.⁷⁻¹⁰ Furthermore, it is also important for all the otolaryngologists to pay more attention to high risk patients with neck swelling and respiratory difficulty.

METHODS: This retrospective study was conducted in patients with deep neck space infection treated at Coimbatore Medical College Hospital, Coimbatore between January 2004 to December 2014. The total number of patients treated were 85 including 67 men and 18 women with age ranging from 0 to 75 years (mean 30.4 ±16.20 Std. deviation). Out of 85 cases, 78% were males and 20% were females.^{11,12}

Age Vs Sex Distribution:

Age	Male	Female	Male %	Female%
0 to 20	22	8	26	9
21 to 40	26	6	31	7
41 to 60	14	3	16	4
61 to 80	5	1	5	1

Table 1: Age/Sex distribution

Age Vs Gender Graph:**Figure 1: Age Vs Gender Graph**

The occurrence of the neck abscess is more common in male between the ages of 0 to 40 years (73%).

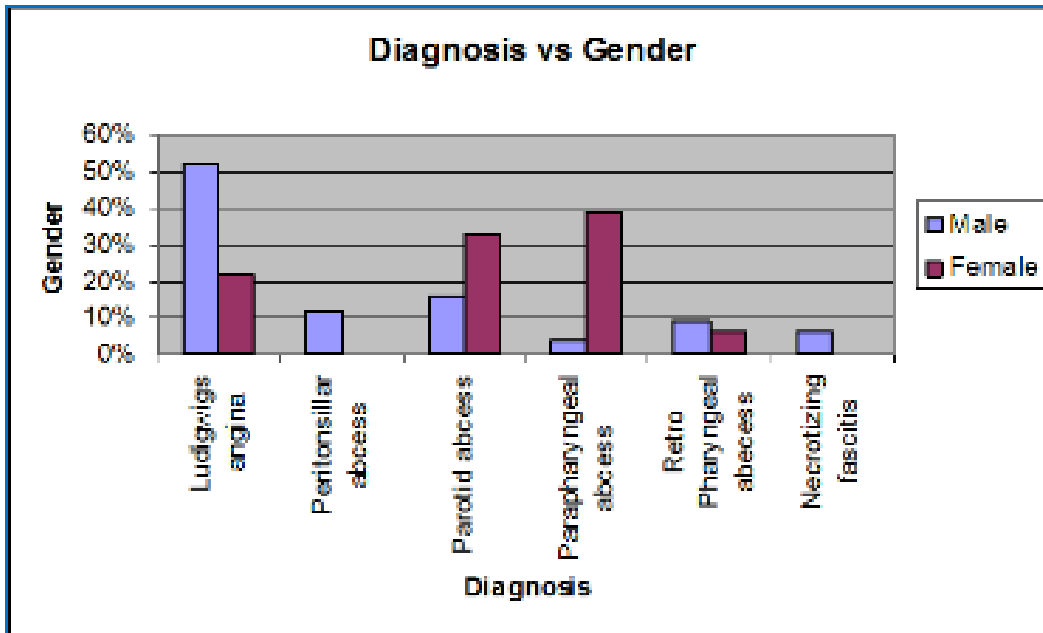
Income Group: When compared between the entire groups to those in the available literature, people belonging to low social economic group were more prone for infection.

Diagnosis: Patients presented with sudden onset of swelling of lower jaw, check & neck /trismus/fever/cough/hoarse voice/dysphagia/stridor with shorter duration were included. With detailed history, clinical ENT examination, radiological investigation, therapeutic needling and transcervical drainage, the following diagnosis were made such as parotid abscess, peritonsillar abscess, Ludwig's angina, parapharyngeal, retropharyngeal, neck space abscess, necrotizing cervical fasciitis and mediastinitis.^{2,5,13}

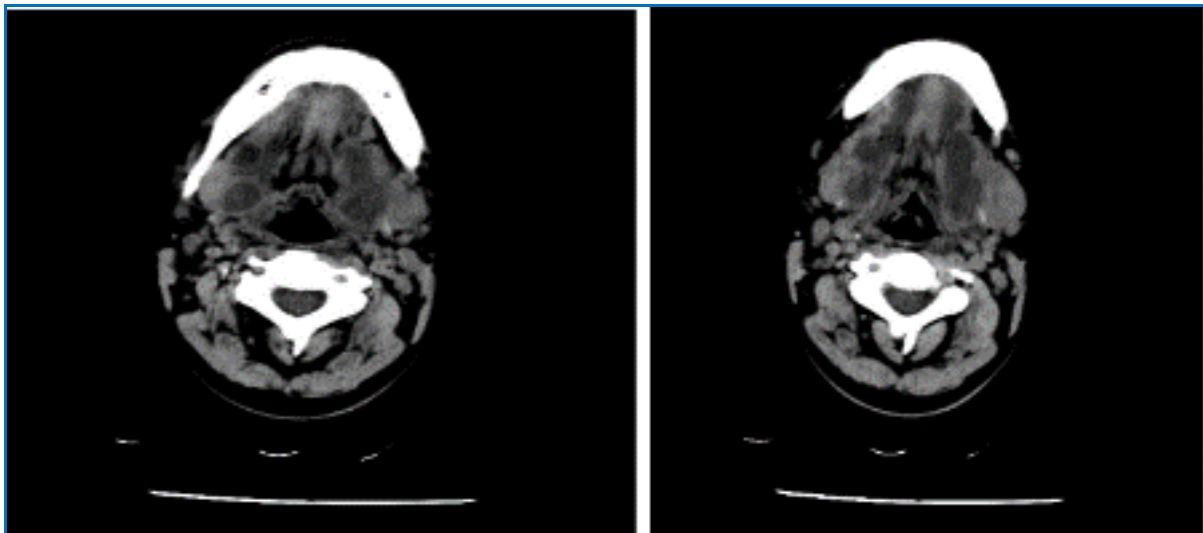
Diagnosis Vs Gender:

Diagnosis	Male	%	Female	%
Ludwig's angina	35	52%	4	22%
Peritonsillar abscess	8	12%	0	
Parotid abscess	11	16%	6	33%
Parapharyngeal abscess	3	4%	7	39%
Retro Pharyngeal abscess	6	9%	1	6%
Necrotizing fasciitis	4	6%	0	

Table 2: Diagnosis Vs Gender

Diagnosis Vs Gender:**Figure 2: Diagnosis Vs Gender**

Among 18 female patients 7 had para pharyngeal abscess (39%) which is significantly associated with sex & diagnosis. The result of CHI - Square analysis ($\chi^2=22.52$) showed $P < 0.01$.

CT Scan of Ludwig's Angina:**Figure 3: CT Scan of Ludwig's Angina**

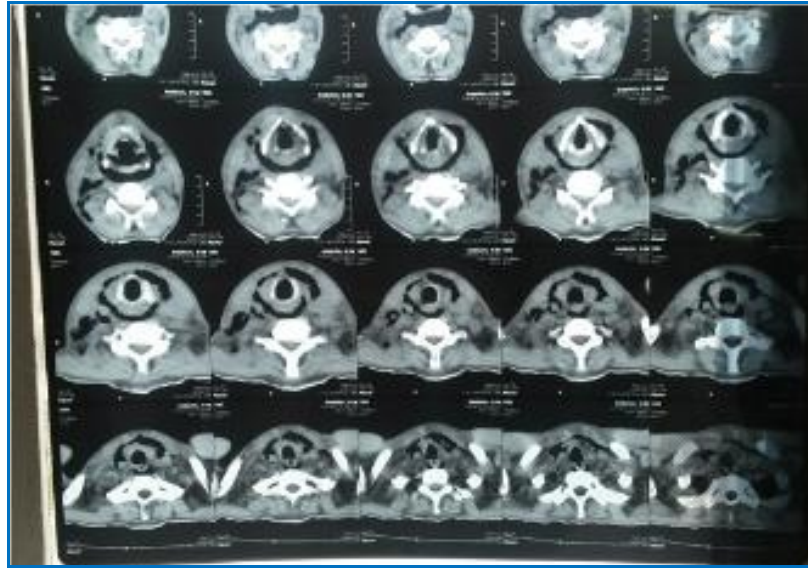
Neck Space Abscess with Mediastinal Extension:

Figure 4: Neck Space Abscess with Mediastinal Extension

Comorbidity & Complications:

Co Morbidity	Male	%	Female	%
Diabetes	18	27%	4	22%
Hypertension	9	13%	2	11%
Dental sepsis	7	10%	10	56%
Stridor	2	3%	0	0
Mediastinitis	2	3%	0	0
Death	8	12%	1	6%

Table 3: Co Morbidity and Complications

In CHI-Square analysis with morbidity and mortality the P value reached statistically significant ($P < 0.05$). Incidence of T2DM 22% and dental sepsis 56% were more in female patients.

Microbiology: Deep neck infection is frequently polymicrobial and often caused by oral bacteria. Aspiration and pus culture were sent for 40 patients. No growth was reported in 32 patients. Staphylococcus aureus was found in 2 patients which was not commonly found in the mouth.

Treatment details:

Treatment	Male	%	Female	%
IV antibiotics only	45	67%	5	28%
Antibiotic With I&D	13	19%	5	28%
Antibiotic with Dental extraction	5	7%	7	39%
Antibiotic with Tracheostomy	4	6%	1	6%

Table 4: Treatment Vs Gender

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I & D done with Ludwig's Angina:



Figure 5: I & D done with Ludwig's Angina

Tracheostomy Done:



Figure 6: Tracheostomy Done

Treatment Vs Gender:

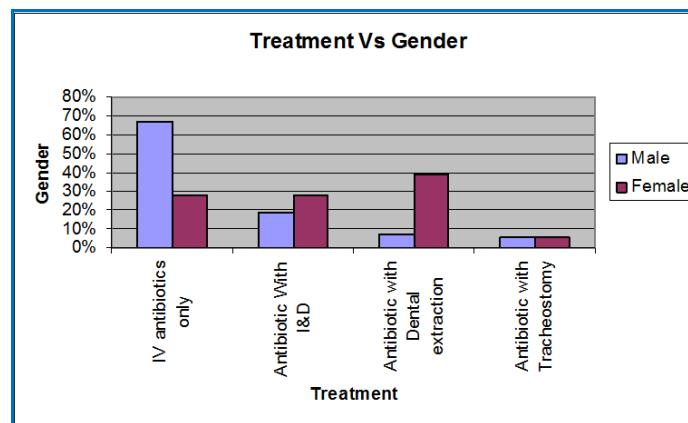


Figure 7: Treatment Vs Gender

The x2 test ($P < 0.01$) shows that treatment modality is significantly associated with gender. Management with antibiotic and procedures are more beneficial than management with antibiotics alone.⁽¹⁴⁾

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Days	Male	Female	Total	%
0 to 7	40	12	52	61
8 to 14	24	6	30	35
15 to 21	2	0	2	2
22 to 30	1	0	1	1

Table 5: Hospital stay

Hospital stay was prolonged with co morbidity and in tracheostomised patients.

DISCUSSION:

Applied Anatomy: The layers of cervical fascia create potential spaces which results in dangerous life threatening infection. Buccal, canine, mastigator, parotid spaces are commonly involved in face. In the neck, infection spreads from peritonsillar, submandibular, sublingual, lateral pharyngeal and anterior visceral space extending to retropharyngeal, prevertebral and carotid sheath spaces.

Outcome of deep neck space infections continue to be associated with severe illness and death. Empiric antibiotic treatment and aspiration for drainage is still the main stay of the management which has improved the outcome of deep neck space infection. If infection is odontogenic, dental extraction is beneficial. Ludwig's angina required intubation or emergency tracheostomy which is lifesaving. Trans cervical drainage with pus or tissue specimen for culture and pathologic evaluation with additional wound debridement prevent recuperative complications such as septic emboli, septic shock and pulmonary aspiration.^(10,15-19)

Use of antibiotics in healthy patients for effective treatment (5 TO 7 DAYS) are Ampicillin sulbactam 1.5 to 3g iv every 6 hours or Cefoxitin 1 to 2 g iv every 6 hours alternative for penicillin – allergic patients Clindamycin 600 to 900 mg iv every 8 hours or Ceftriaxone 1 to 2g iv every 12 hours. In compromised or hospitalized patients or Pseudomonas aeruginosa suspected (Duration 3 WEEKS) Piperacillin–tazobactam 3 to 0.375 g I every 4 to 6 hours, or Clindamycin 600 to 900mg iv every 12 hours or plus Ceftazidime 1 to 2 every 12 hours for necrotising fasciitis Ceftriaxone 2g iv every 8 hours plus Clindamycin 900 mg iv every 8 hours or plus Metronidazole 500mg iv every 6 hours for 2 weeks are mandatory.⁽¹⁷⁾

RESULTS: The case sheets of 85 patients were analyzed among which 67 (78%) were men and 18 (22%) were women. Sixty two (73%) of the patients were lesser than 40 years of age. There were 70 (83%) patients who had associated with systemic diseases, of those having diabetic mellitus is 22 (26%), Dental infection was the common cause of deep neck infection 17 (20%). Ludwig's angina (sub mandibular and sub lingual spaces) was the most commonly involved space (46%). 18 (21%) patients underwent surgical drainage. 5 (6%) patients developed lethal complication who received tracheostomy. Those patients with systemic complications or who received tracheostomy had longer hospital stay with mean 7. 47 days. There were 9 deaths (Mortality rate – 11%).

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Observed		Predicted		
		Death/Alive		Percentage Correct
		Alive	Death	
Death/Alive	Alive	75	1	98.7
	Death	3	6	66.7
Overall Percentage				95.3

Table 6: Classification Table

Classification table shows that the regression model has predicted 95.3% of cases are correctly in the respective death or alive group.

	B	S.E.	P-value	Odds Ratio
Gender	.245	1.830	P>0.05	1.278
Age	-.008	.060	P>0.05	.992
Onset days	.345	.726	P>0.05	1.413
Hospital stay (days)	.065	.138	P>0.05	1.068
Parapharyngeal abscess	1.227	1.927	P>0.05	3.411
Necrotising fasciitis	3.156	1.565	P<0.05	23.478
Retropharyngeal abscess	3.408	1.632	P<0.05	30.200
Diabetics	2.647	1.538	P<0.10	14.111
SHT	2.180	1.747	P>0.05	8.846
(Constant)	-6.465	2.415		

Table 7: Variables in the Equation

Logistic regression analysis was performed to predict the mortality of neck abscess with the parameters such as gender, age, onset days, hospital stay, parapharyngeal abscess, necrotizing fasciitis, diabetes and systemic hypertension. The results show that necrotizing fasciitis and parapharyngeal abscess and diabetes were found to be significant predictors of mortality. The patients with necrotizing fasciitis are 23.47 times more fatal than those who do not have. Similarly retropharyngeal abscess is 30 times more fatal and with DM is 14 times more fatal. In case of SHT even though it is not a significant predictor, those with SHT are 8.8 times more prone for complications.

DISCUSSION: The layers of cervical fascia create potential spaces resulting in dangerous life threatening infections. In face buccal, canine, mastigator, parotid spaces are involved. In the neck, infection spreads from peritonsillar, submandibular, sublingual, lateral pharyngeal and anterior visceral space extending to retropharyngeal prevertebral and carotid sheath spaces.

Empiric antibiotic treatment and aspiration for drainage is still the main stay of the management which has improved the outcome of deep neck space infection. If infection is odontogenic, dental extraction is beneficial. Ludwig's angina required intubation or emergency tracheostomy which is lifesaving. Transcervical drainage with pus or tissue specimen for culture and

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pathologic evaluation with additional wound debridement prevent recuperative complications such as septic emboli, septic shock and pulmonary aspiration.^{10,15-19}

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CONCLUSION: The present study suggests that treatment of deep neck infection in a higher risk group (Older age with diabetics, with dental sepsis) needs priority attention to prevent complications and even the possibility of death. Early surgical drainage and tracheostomy proved to be the main stay with empiric antibiotic therapy.

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AUTHORS:

1. S. Dhanalakshmi

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of ENT, Coimbatore Medical College, Coimbatore.

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NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. S. Dhanalakshmi,
Majestic Landmark,
Sivanandha Colony,
Coimbatore-641012.
E-mail: dhanalakshmithara@gmail.com

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