Characteristics of a Deep Neck Abscess In RSUP Haji Adam Malik Medan 2013-2018

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***Abstract*- Background:** Deep neck abscesses can be caused by tissue damage due to infection of the teeth, mouth, throat, nose, and other surrounding structures. Abscess formation is the result of the development of the normal flora in the body. Normal flora can grow and reach sterile areas of the body either by direct extension, or through lacerations or perforations. Most deep neck abscesses are caused by a mixture of various germs, both aerobic, anaerobic, and facultative anaerobes. The spread of deep neck abscesses can be done in several ways, namely hematogenous, lymphogenous and gaps between the deep neck spaces so that if there is no proper therapy it can cause various complications.

Objective: to determine the characteristics of a deep neck abscess at RSUP H Adam Malik Medan in 2013 - 2018.

Methods: This research is a descriptive type with a cross-sectional design (cross-sectional) where the research sample is all data on deep neck abscess patients who come to the hospital. H. Adam Malik, namely January 2013 - December 2018.

Results: In this study, the majority of patients with neck abscess were found in men (68.3%), where the majority had the age group> 50-60 years (26.8%). In addition, the majority of patients with deep neck abscesses had involvement of the anatomical location of the submandibular space (63.4%) and the most rarely involved was the parapharynx space (2.4%). The majority of patients with deep neck abscesses were not accompanied by comorbidities (53.1%), while the most common comorbidities were DM (26.8%). The results of this study showed that most deep neck abscess therapy was medical and operative (43.9%). The majority of patients with neck abscesses were without complications (75.6%), while the most complication was sepsis (14.6%).

Conclusion: The incidence of deep neck abscesses became less frequent after antibiotic therapy was discovered. However, if a deep neck abscess occurs, caution should be taken because late treatment is often followed by the spread of inflammation and can cause various complications.

***Index Terms*-** characteristics, deep neck abscess, 2013-2018

I. INTRODUCTION

Deep neck abscesses can be caused by tissue damage due to infection of the teeth, mouth, throat, nose, and other structures around them. The incidence of deep neck abscesses became less frequent after antibiotic therapy was discovered. However, if a deep neck abscess occurs, caution must be taken because late treatment is often followed by the spread of inflammation and can cause various complications such as mediastinitis, sepsis and edema of the larynx.[1]

Abscess formation is the result of the development of the normal flora in the body. Normal flora can grow and reach sterile areas of the body either by direct extension, or through lacerations or perforations. Based on the peculiarities of the normal flora present in certain body parts, the germs from the abscess that are formed can be predicted based on their location. Most deep neck abscesses are caused by a mixture of various germs, both aerobic, anaerobic, and facultative anaerobes.[2]

The incidence of deep neck abscesses began to decline significantly since the era of antibiotic use. In addition, improved oral health also plays a role in this. Before the antibiotic era, as many as 70% of deep neck infections originated from the spread of infection in the pharynx and tonsils to the parapharynx. Yang et al reported that out of 100 cases of deep neck abscesses studied from April 2001 to October 2006, the ratio between men and women was 3:2.[3]

At RSUP dr. Sardjito Yogyakarta during 2014, found 17 patients with deep neck abscesses with the most frequent abscess location in the submandibular space, namely 64.70%, with the most common pathogenesis being odontogenic 29.41% .[3]

According to M. Arvin's research, dr. M. Hoesin Palembang, of the 26 cases studied from 2012 to 2015, patients with deep neck abscesses with the most culture results were Klabsiella pneumoniae (75%), and 23.1% of cases were accompanied by diabetes mellitus and none had immunodeficiency.[4] Based on Syaiful Rizal's research from 2014 to 2017 at Dr. Soetomo General Hospital in Surabaya, it was found that meropenem was the antibiotic with the best sensitivity.[5] Meanwhile, at H. Adam Malik Hospital Medan, of the 40 cases studied from 2006 to 2012, 85% had abscesses. deep neck without complications, and 60% of cases were treated with medical and operative, and 10% of the results of treatment were declared dead.

Deep neck abscess occurs due to various causes and in certain patient characteristics the incidence of deep neck abscess is higher. Therefore, research on the prevalence of deep neck abscesses will be conducted at RSUP Haji Adam Malik Medan for the period January 1, 2013 - December 31, 2018 based on various patient characteristics.

II. METHOD

This research is a descriptive type with a cross-sectional design (cross-sectional) where the research sample is all data on deep neck abscess patients who come to the hospital. H. Adam

Malik, namely January 2013 - December 2018. This research was carried out after obtaining permission from the Research Ethics Commission of the Faculty of Medicine, University of North Sumatra and a research permit from the Directorate of Human Resources and Education for Research and Development Installation of H. Adam Malik Hospital Medan.

III. RESULT

Of the 41 neck abscess sufferers, the majority were male, namely 28 people (68.3%) while 13 were female (31.7%). The ratio of men and women with deep neck abscess was 2.15: 1 (Table 1).

Table 1. Frequency distribution by sex

Sex	n	%
Man	28	68,3
Woman	13	31,7
Total	41	100

Of all research subjects, the majority of people with deep neck abscesses were 11 people> 50-60 years old (26.8%) while the lowest percentage was 3 people (7.3%) aged> 10-20 years (Table 2).

Table 2. Frequency distribution by age

Age	n	%
>10-20 years old	3	7,3
>20-30 years old	7	17,1
>30-40 years old	7	17,1
>40-50 years old	6	14,6
>50-60 years old	11	26,8
>60 years old	7	17,1
Total	41	100

Based on table 3, the majority of the submandibular anatomical location involved 26 people (63.4%), while the least involved was retrofaring, namely 1 person (2.4%).

Table 3. Frequency distribution based on anatomical location

Anatomical location	n	%
Peritonsillar abscess	11	26,8
Retropharyngeal abscess	1	2,4
Parapharyngeal abscess	3	7,3
Submandibular abscess	**26**	**63,4**
Total	41	100

Based on table 4, out of 41 people with neck abscess, the majority did not have comorbidities, 23 people (53.1%). While the least comorbidities were DM accompanied by pulmonary tuberculosis, then HIV / AIDS, and hypertension each 1 person (2.4%)

Table 4. Frequency distribution based on comorbidities

Comorbidities	N	%
DM	11	26,8
DM + Pulmonary TB	1	2,4
Pulmonary TB	4	9,8
HIV / AIDS	1	2,4
Hypertension	1	2,4
No comorbid	**23**	**53,1**
Total	41	100

Based on table 5, of the 19 patients with deep neck abscesses who received medical therapy, there were 15 patients who recovered and 4 patients died, while of the 4 patients who received combination therapy, there were 2 patients who recovered and 2 patients who died.

Table 5. Frequency distribution based on treatment and treatment outcome

			Outcome		
			Heal	Died	Total
Treatment	Medicine	n	15	4	19
		% Treatment	78.9	21.1	100.0
		% Outcome	46.9	44.4	46.3
	Incision & Medicine	n	15	3	18
		% Treatment	83.3	16.7	100.0
		% Outcome	46.9	33.3	43.9
	Incision, Tracheostomy & Medicine	n	2	2	4
		% Treatment	50.0	50.0	100.0
		% Outcome	6.3	22.2	9.8
		Total	32	9	41
		% Treatment	78.0	22.0	100.0
		% Outcome	100.0	100.0	100.0

Based on table 6, the majority of 41 people with neck abscesses were without complications, namely 31 people (75.6%), while the most rare complications of deep neck abscesses were sepsis and airway obstruction as many as 2 people (4.9%).

Table 6. Frequency distribution based on complications

Complications	n	%
Sepsis	6	14,6
Upper airway obstruction	2	4,9
Sepsis + Upper airway obstruction	2	4,9
No complication	**31**	**75,6**
Total	41	100

Based on table 7 of 41 neck abscess sufferers, the majority of them had a bacterial pattern in the form of Streptococcus β-haemolyticus, namely in 10 people (24.4%) while the least common patterns of bacteria were Escherecia coli and Klebsiella ozaenae, each of which was found in 1 person (2 , 4%).

Table 7. Frequency distribution based on germ pattern

Germ pattern	n	%
Klebsiella pneumonia	7	17,1
Pseudomonas aeruginosa	6	14,6
Staphylococcus aureus	6	14,6
Streptococcus viridans	2	4,9

Streptococcus α-haemolyticus	3	7,3
Streptococcus β-haemolyticus	**10**	**24,4**
Escherecia coli	1	2,4
Klebsiella ozaenae	1	2,4
No germ	5	12,2
Total	41	100

IV. DISCUSSION

In this study, the majority of patients with neck abscess were found in men (68.3%) compared to women (31.7%). This is similar to the results of a study by Gorjon, et al. (2011) regarding deep neck abscesses over a period of 11 years (2000-2010) with 286 cases stating that there were more patients with deep neck abscesses in men with a ratio of male patients to female. 1,2: 1.[7] In a study on gender in patients with periodontal disorders conducted by Desvarieux, it was reported that women suffer from periodontal infections more often than men, but sex is not a significant risk factor because of awareness of dental health, habit. smoking, and hormones are more significant as risk factors.[8]

In this study, it was found that in the majority of patients with neck abscesses, the age group was> 50-60 years (26.8%), while the least age group was> 10-20 years (7.3%). This is in line with the research conducted by Jun and his friends from January 1998 to August 2007, where there were 56 patients with deep neck abscesses with a mean age of 50 and 53 years.

In a number of other studies that have been conducted on deep neck abscesses, most patients were found in their 20s and 30s. In a study conducted by Meher regarding a prospective study of 54 cases of deep neck abscesses, the most patient age group was 20-29 years, namely 29.[10] The most age group found in deep neck abscesses was young adults, with 80.9% of cases occurring under the age of 40 year. Young and middle adulthood are the most common age groups for dental and tonsil infections and dental infections which are the most common cause of deep neck abscesses.

In this study, it was found that the majority of patients with deep neck abscesses had involvement of the anatomical location of the submandibular space, namely (63.4%) and the most rarely involved was the parapharyngeal space (2.4%). This is in accordance with the study conducted by Gorjon et al. It was found that 50.6% of patients with peritonsillar abscess, 58% with submandibular abscess, 23% with parotid abscess, 17% of patients with parafaryngeal abscess, 16% of patients with retrofaryngeal abscess, 11% of patients with Maseter abscess, 9% of patients with pterygomaxillary abscess and 7% of patients with Ludovici's pseudoangina.[7] Meher et al's study also found the same thing, namely in 54 cases of deep neck abscess involved were submandibular, namely 20 patients. Other rooms involved were submental 10 patients, parafaring 6 patients, retrofaring 4 patients and peritonsil 3 patients.

According to Warshafsky about the anatomical picture of the deep neck, there are deep neck spaces that have a direct anatomical relationship. As in the submandibular space which is directly adjacent to the inferior part of the parafaryngeal space, and the parapharyngeal space is also directly related to the anterolateral part of the retrofaryngeal space. Meanwhile, the submandibular space and the peritonsil space are not directly related. So that the possibility of abscess cases in the submandibular space and peritonsil space occurs due to infection in more than one location. Deep neck abscesses in various studies have been caused by various causes such as odontogenic infections, tonsillitis, upper respiratory tract infections, use of injecting drugs into the jugular veins, and infections due to foreign bodies. Abscesses due to odontogenic infection are usually submandibular, sublingual, or submental abscesses which may progress to multiple abscesses.[11]

In this study, it was found that the majority of patients with deep neck abscesses were not accompanied by comorbidities, namely 23 patients or 53.1%. While the most common comorbidities were DM (26.8%). This is slightly different from the research conducted by Meher and colleagues on 54 cases of neck abscesses, where the most common comorbidities were diabetes mellitus, namely 8 patients and 1 HIV patient.[10]

Diabetes mellitus is often an aggravating factor that often causes an infection to progress to abscess formation and become multiple or extensive abscesses. The prevalence rate of diabetes mellitus in Medan City is quite high, namely 27 people out of 1000 population. In a study on the comparison of clinical features of patients with diabetes mellitus and without diabetes mellitus conducted by Huang, the percentage of cases of deep neck abscesses with diabetes mellitus was 39.7% .[11] In patients with deep neck abscesses with diabetes mellitus the rate was quite high because in a study of diabetes mellitus performed in animals and in vitro, host immune function is impaired as a result of short- and long-term hyperglycemia, including neutrophil bactericidal function, cellular immunity, and complement activation. This weakening of the immune system is believed to cause the infection to become pyogenic or to form purulent and progress rapidly to a large abscess. Diseases that can lead to immunodeficiency conditions include diabetes, HIV infection, AIDS, hematological diseases and oncological diseases. Immunodeficiency diseases with various mechanisms will result in a low ability to fight microorganisms so that the infection continues to become an abscess.

From the results of this study, it was found that deep neck abscess therapy was medical and operative, namely 18 patients (43.9%) while medical therapy was 19 patients (46.3%).

In this study, the majority of patients with neck abscess received medical therapy (46.3%) and the rarest was a combination of incision, tracheostomy, and medical (9.8%). This is different from the study conducted by Coelho and colleagues in 150 cases of deep neck abscesses, which were found in 109 patients (73%) who were treated with medical and operative. Meanwhile, 41 (27%) patients with neck abscess in other medical therapy.[12]

Medical therapy using high doses of antibiotics is the first therapy in the management of deep neck abscess cases. Treatment of deep neck abscesses using medical and operative therapy is best used in cases where there are signs of fluctuation. The operative measures that can be done to evacuate the abscess are by way of aspiration, incision and drainage. However, medical administration along with incision and drainage is very important.[12]

In this study, the majority of patients with neck abscesses were not accompanied by complications, namely 31 patients (75.6%), while the most common complication was sepsis in 6 patients (14.6%). This is consistent with research conducted by

Rharjo Sutji on 42 patients with deep neck abscesses in Makassar where 27 (64.3%) patients were found without complications.[12]

Complications of deep neck abscess are rare, this may be due to the use of antibiotics in accordance with deep neck infections that usually originate from the pharynx, tonsils and teeth. Complications can occur if the diagnosis is made late, or there are predisposing factors such as diabetes mellitus, immunocompromised diseases and others.[12]

In this study, the majority of the germs that caused neck abscess were Streptococcus ß haemolyticus (24.4%), while the most rare bacteria were Escheria coli and Klebsiella ozaenae, each 2.4%. In contrast to the research conducted by Yang et al, where the most germs found in patients with deep neck abscesses were Streptococcus viridans as much as 48.31%, then Klebsiella pneumoniae as much as 29.21% and Staphylococcus aureus as much as 14.60%.[13] In a study conducted by Huang et al, the most bacteria found were Streptococcus viridans and Klebsiella pneumoniae in the same number, namely 33.9%.[14]

Most cases of deep neck abscess contain mixed or combined aerobic and anaerobic bacteria. The presence of symptoms such as a smelly discharge is a sign of anaerobic infection. Most odontogenic abscesses involve anaerobic bacteria. No germ growth was found, presumably because patients with deep neck abscesses have received medical therapy prior to microbiological examination. [10,12]

In this study, 19 patients with deep neck abscesses who received medical therapy found 15 patients who recovered and 4 patients died, while from 4 patients who received combination therapy, there were 2 patients who recovered and 2 patients who died. Likewise Raharjo's research on 42 patients with deep neck abscesses, found that 40 patients recovered and 2 patients died.[12]

The rapid development of antibiotics has an impact on reducing the incidence and mortality of deep neck abscesses so that the mortality rate can be reduced to a low one. People with deep neck abscesses can recover perfectly if they get prompt and appropriate treatment. There are several difficult challenges with deep neck abscesses, namely if the abscess location is quite complex and there is a relationship between the spaces in the neck. This is what often results in complications and prolonged healing if late treatment and comorbidities occur.[12]

V. CONCLUSION

Research on the characteristics of deep neck abscess patients at RSUP H. Adam Malik Medan for the period January 1 2013- December 31 2018 has been carried out with the following conclusions: > 50-60 years, that is 26.8% and among them are male (68.3%). The anatomical location involved the majority of the submandibular (63.4%), the majority of people with neck abscess had comorbidities with diabetes mellitus (53.1%), received treatment in the form of medicametosa (26.8%), and experienced complications of sepsis (14.6%). %). The majority of germs found in neck abscesses were Streptococcus ß haemoliticus (24.4%). Deep neck abscess patients who received medical therapy were mostly cured as a result of treatment (78%).

VI. SUGGESTION

Microbiological examination is very important in supporting the diagnosis and therapy of deep neck abscesses, so it needs to be done and in the way of collecting and sending pus specimens, it is necessary to pay more attention so as not to affect the results of these cultures.

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