Laryngeal Tuberculosis- A Retrospective Study in Three Medical Colleges of West Bengal, India

Saileswar Goswami^{1*}, Dipankar Kumar Basumata²

¹Associate Professor, Department of E.N.T., Calcutta National Medical College, Kolkata, West Bengal, India ²Post Graduate Trainee, Department of E.N.T., Calcutta National Medical College, Kolkata, West Bengal, India

Original Research Article

*Corresponding author Saileswar Goswami

Article History Received: 08.07.2018 Accepted: 19.07.2018 Published: 30.07.2018

DOI: 10.36348/sjmps.2018.v04i07.018



Abstract: Laryngeal tuberculosis is an extra pulmonary form of tuberculosis and is found in about 2% of all tuberculosis cases. A retrospective analysis of 31 cases of laryngeal tuberculosis was done in the present study extending for 30 years in three Medical Colleges of West Bengal, India. Out of these 31 cases in the study, 20 patients were male and 11 were female with an M: F Ratio of 1.8:1. The age of the patients ranged from 31 years to 59 years. The highest incidence of 45.2% was observed in the age group of 51 to 60 years, followed by 35.5% in the age group of 41 to 50 years and 19.4% in the age group of 31 to 40 years. All the patients presented with hoarseness of voice and cough was the second common symptom. Out of the 31 patients, 9 patients complained of pain in the throat and seven of those had referred earache also. In majority of the cases, the lesions were limited to the vocal cords, arytenoids, and posterior commissure. False cord was involved in 15 cases and ulcer over the arytenoid was found in 14 cases. Patients with lesions involving only the vocal cords, presented with hoarseness of voice, whereas lesions involving the other areas of the larvnx, such as arvtenoid and arvepiglottic fold presented with odynophagia. Enlargement of the regional lymph nodes was observed in 5 cases out of the total 31 cases. Most of the cases were found during the first 20 years of the study whereas only 4 cases were found during the last 10 years, which could be attributed to the successful implementation of the Revised National Tuberculosis Control Programme in India. However, the emergence of multi drug resistant strain of the causative bacillus and tuberculosis-HIV co infection has complicated the scenario at present. On histopathological examination, tubercular granuloma with stromal hyperplasia, large number of phagocytes and giant cells, epitheloid cells, Langhans cells and typical necrosis with caseation were found. Confirmation of the diagnosis utilizing a proper diagnostic algorithm and treatment with specific Anti Tubercular Drugs (ATDs) are most important in the management of laryngeal tuberculosis. Keywords: hoarseness, extra pulmonary tuberculosis, laryngeal tuberculosis,

tubercular granuloma.

INTRODUCTION

Laryngeal tuberculosis is the most common granulomatous disease of the larynx. It represents less than 2% of total extra pulmonary tuberculosis cases. The vocal cords are the commonest site of involvement [1]. Dysphonia and cough are the two main presenting symptoms of laryngeal tuberculosis. It is also the commonest form of tuberculosis found in the ear, nose and throat [2].

In general, tuberculosis is known since ancient era and has been under continuous extensive research since ages. In spite of that, it still poses a major global health problem, particularly following the development of Multi Drug Resistant (MDR) strain of the causative bacillus Mycobacterium tuberculosis. An initial drastic fall in the incidence was noticed with a fall in tuberculosis related mortality and morbidity after the invention and judicious use of anti tubercular regimens. But tuberculosis-HIV (immunosuppressive disorder) co-infection has made the scenario further complicated [2]. The burden is more obvious in developing countries like India. World Health Organisation registered 9 million new cases of tuberculosis in the year 2013. Out of the 1.5 million people who died of TB in the year 2013, 360,000 were HIV positive. Tuberculosis has become the second leading cause of death as a single infectious agent following HIV infection in 2013 [1].

Tuberculosis mostly affects the lungs but can affect any part of the body except nail, hair and teeth. In the head and neck region, tuberculosis can affect the lymph nodes, larynx, middle ear, oral cavity and pharynx. In the head and neck, cervical tubercular lymphadenitis was the most common lesion followed by laryngeal tuberculosis and tubercular otitis media with mastoiditis [3].

Zhao *et al.*, [4] has described three types of lesions in laryngeal tuberculosis, namely Edema type, Proliferation type, and Ulcer Exudation type. Histopathological and microscopical analysis of laryngeal tuberculosis lesions are required to differentiate from other diseases e.g. neoplasia; Leishmaniasis and Paracoccidiodomycosis (granulomatous infectious disease), Wegener's disease and Amyloidosis (non infectious granulomatous disease [1].

Primary laryngeal tuberculosis is caused by direct seeding of the bacillus Mycobacterium tuberculosis during inspiration and secondary laryngeal tuberculosis is caused by the seeding of bacilli in the larynx from the lungs. Lodha *et al.*, [5] observed laryngeal involvement in 15–37% of the cases of pulmonary tuberculosis. Haematogenous spread of the bacilli may also cause primary tuberculosis [6].

MATERIALS AND METHODS

The study was conducted in three Medical Colleges in the state of West Bengal, India, over a period of 30 years from 1988 to 2018. The patients were selected from those attending the ENT outpatient department with hoarseness of voice. All those patients were examined and the patients with hoarseness of voice for more than 15 days and pathology confined within the larynx were included in the study. Patients with hoarseness of voice for less than 15 days or lesions extending beyond the larynx were excluded from this study. The patients presenting with other voice disorders and patients with immunosuppression were also excluded.

Thorough history was taken in all cases. Variables such as age, sex, economic status, educational level, smoking and drinking habits were taken into considerations. Patients with daily habits of smoking regardless of quantity were considered as smokers and patients consuming any kind of alcoholic beverage giving a positive response to at least two questions in CAGE Questionnaire were considered as drinkers.

Thorough and careful ENT and general examination were done in all cases. The patients were examined by indirect laryngoscopy and/or by fibre optic laryngoscopy to find the pathology involving the larynx. Chest x-ray, routine haematological and biochemical tests were done in all cases. Thyroid function tests were done in selected cases.

The patients who were clinically suspected to be suffering from tuberculosis were subjected to further investigations to aid the diagnosis. Montoux test was done in those cases and skin induration more than or equal to 5 mm diameter was considered as positive. Ziehl-Neelsen stain of the smears prepared from sputum was done to detect the presence of AFB. The sputum in suspected cases of tuberculosis was also examined by culture using Lowenstein-Jensen Medium. HRCT scan of the chest and/or the larynx was done in some cases. During the first twenty years of our study, conventional diagnostic tools were used but during the last 10 years of the study, help of most modern technology such as CB-NAAT (Cartridge Based Nucleic Acid Amplification Test) was done.

Selected cases were admitted and conventional direct laryngoscopy or microlaryngoscopy was done under general anaesthesia. Microlaryngoscopy was done using a Zeiss operating microscope fitted with a 400 mm objective lens. Photographs were taken either using a conventional SLR camera fitted with the side tube of the operating microscope or using digital cameras. Necessary surgeries were done. Biopsies were taken where needed and submitted to the pathologist for histopathological examination. Microbiological examinations of the tissue fragments including culture for AFB were done as well. The patients, who were clinically not suspected to have laryngeal tuberculosis but later on found to have tuberculosis on the basis of histopathological examination, were further investigated to assess the involvement and extent of the pathology as described.

RESULTS AND DISCUSSION

In our study comprising of 765 patients presenting with hoarseness of voice, 31 (4.1%) patients were found to be suffering from laryngeal tuberculosis. Agarwal *et al.*, [7] in their study of 534 patients with hoarseness of voice, found 14 cases of laryngeal tuberculosis. Soni *et al.* [08] in his study found 7 cases of laryngeal tuberculosis out of 100 cases of benign laryngeal lesions. Chopra *et al.*, [9] in their study of 67 patients with hoarseness of voice, found 3 cases of laryngeal tuberculosis. Hegde *et al.*, [10] in their study of 42 patients with benign lesions of the larynx found 6 cases of laryngeal tuberculosis.

Out of these 31 cases in our study, 20 patients were male and 11 were female with an M: F Ratio of 1.8:1. Bruzgielewicz *et al.*, [11] in their study also observed a male preponderance and found 14 male and 6 female cases out of the 20 cases of laryngeal tuberculosis. However Broek [12] found no difference in the sex distribution of patients and observed an M: F ratio of 1:1 in laryngeal tuberculosis patients.

Table-1: Sex distribution of patients.		
Sex	No. of Cases	Percentage %
Male	20	64.5%
Female	11	35.5%
Total	31	100.0%



Chart-1: Pie Chart showing sex distribution of patients

Laryngeal tuberculosis was found to be commoner in the 4th, 5th, and 6th decades of life. The youngest of our patient was 31 years of age and the oldest was of 59 years. The highest incidence 45.2% (14 patients) was noticed in the age group of 51 to 60 years, followed by 35.5% (11 patients) in the age group of 41 to 50 years and 19.4% (6 patients) in the age group of 31 to 40 years. Bruzgielewicz *et al.*, [11] in their study observed that the age of the patients ranged from 42 years to 75 years with the mean age of 56.5 years. However Broek [12] stated that the age of the patients were usually between 20 and 40 years.

Table-2: Age distribution of patients.					
Age Groups(in years)	No. of Cases	Percentage%			
31-40	6	19.4%			
41-50	11	35.5%			
51-60	14	45.2%			
TOTAL	31	100.0%			



Chart-2: Bar diagram showing age distribution of patients

Out of the total 31 cases in our study, 12 cases (38.7%) were from rural area and 19 cases (61.3%)

were from urban area. This is probably due to overcrowding in urban population.

Table-3: Residential Distribution of PatientsResidenceNo. of CasesPercentage%

Saileswar Goswami & Dipankar Kumar Basumata., Saudi J. Med. Pharm. Sci., Vol-4, Iss-7 (Jul, 2018): 824-829



Chart-3: Bar diagram showing residential distribution of patients

Only 18 patients (58.1%) were smokers, while 13 (41.9%) were non-smokers. Patients with habits of smoking were found to have multiple laryngeal lesions in contrast to mostly single laryngeal lesion in non smokers. Reis et al., [1] also observed similar findings

in his study. In our study, we found no case of primary laryngeal tuberculosis. Hegde et al., [10] in their study with 42 patients of benign laryngeal lesion found 6 cases of laryngeal tuberculosis and out of these 6 cases there was only 1 case of primary laryngeal tuberculosis.

Table-4: Relation with smoking.				
Smoking	No. of Cases	Percentage (%)		
Smoker	18	58.1%		
Non-smoker	13	41.9%		
Total	31	100%		

...

On examination of the larynx granulation tissues were found involving the vocal cords, arytenoids, and posterior commissure in majority of the cases. False cord was involved in 15 cases. In 14 cases there was ulcer over the arytenoid. Broek [12] also stated such predilection for involvement. Lucena et al., [13] found involvement of vocal folds in 87.5% patients, vestibular folds in 66.7%, epiglottis in 41.7%, arytenoid in 50%, aryepiglottic folds in 33.3%, and interarytenoid region in 33.3% patients. In case of lesions involving the vocal cords, there was no involvement of the opposite vocal cord as also observed by Kumar et al., [14]. Oedema was a constant feature and vocal cords were bilaterally mobile in all the cases corresponding to similar finding by Gandhi et al., [2].

Zhao et al., [4] in their study of 61 cases of laryngeal tuberculosis found enlarged lymph nodes in the neck in 6 cases. They described three types of lesions in laryngeal tuberculosis, namely Edema type, Proliferation type, and Ulcer Exudation type. In our study we observed enlargement of the regional lymph nodes in 5 cases out of the total 31 cases. We did not observe sufficient differences in the clinical appearance of the lesions to divide them in different types as described by Zhao et al., [4].

All the patients had chief complaint of hoarseness of voice. In addition to that, some patients had other complaints also as described in Table-5. Cough was the second common complaint. Most of the patients had multiple additional complaints. Out of the 31 patients, 24 patients had loss of weight, 23 patients had fever and 17 patients had haemoptysis. Out of the 31 patients, 9 patients complained of pain in the throat and seven of them had referred earache also. Patients with only vocal cord lesions presented with hoarseness of voice whereas lesions involving the other areas of the larynx, such as arytenoid and aryepiglottic fold, presented with odynophagia. These findings are similar to the findings of Reis et al., [1].

ruble et complaints in addition to nourseness.				
Complaints	No. of Cases			
Cough	25			
Loss of weight	24			
Fever	23			
Haemoptysis	17			
Pain in throat	9			

Table-5. Complaints in addition to hoarseness

Saileswar Goswami & Dipankar Kumar Basumata., Saudi J. Med. Pharm. Sci., Vol-4, Iss-7 (Jul, 2018): 824-829

5

Neck swelling	

Bruzgielewicz *et al.*, [11] in their study of 20 cases of laryngeal tuberculosis observed that the complaints at admission were hoarseness in (90%) cases, cough in (47%) cases, dysphagia in (20%) cases, and dyspnoea in (10%) cases.

In the study conducted by Ramadan *et al.*, [15], 4 out of the 16 cases of laryngeal tuberculosis presented with stridor, for which tracheostomy had to be performed. However, no patient presented with stridor in our study and none of our 31 patients required tracheostomy.

Sometimes laryngeal tuberculosis clinically looks like carcinoma of the larynx. Kettani *et al.*, [16]

reported a case of laryngeal tuberculosis mimicking laryngeal carcinoma. Histopathological examination can easily differentiate the two conditions.

In our study, most of the cases were detected during the first 20 years whereas only 4 cases were found during the last 10 years. This can be attributed to the successful implementation of the Revised National Tuberculosis Control Programme in India.

On histopathological examination, tubercular granuloma with stromal hyperplasia, large number of phagocytes and giant cells, epitheloid cells, Langhans cells and typical necrosis with caseation were found.



Fig-1: Histological picture of tubercular granuloma showing Langhans type of giant cells. (x350)

CONCLUSION

In our study conducted for 3 decades, a male preponderance was found in the patients suffering from laryngeal tuberculosis. The ages of the patients were from 31 years to 60 years with a predilection towards the age group between 51 to 60 years. Vocal cord was found to be commonest site of involvement and hoarseness was the most common complaint followed by cough. Sometimes involvement of multiple sites was observed, particularly in case of smokers. Dysphagia was found to be present in cases with involvement of arytenoids and aryepiglottic folds.

With successful implementation of the Revised National Tuberculosis Programme in India, there is a significant decrease in the incidence of laryngeal tuberculosis. However, the emergence of multi drug resistant strain of the causative bacillus and tuberculosis-HIV co infection has complicated the scenario at present.

Confirmation of the diagnosis utilizing a proper diagnostic algorithm and treatment with specific Anti Tubercular Drugs (ATDs) are most important in the management of laryngeal tuberculosis. Tubercular granuloma on histopathological examination is a golden finding related to the diagnosis of laryngeal tuberculosis. Proper voice therapy, cessation of smoking and a good practice of personal hygiene are of immensely beneficial on a long term basis.

REFERENCES

- Reis, J. G. C., Reis, C. S. M., da Costa, D. C. S., Lucena, M. M., de Oliveira Schubach, A., Oliveira, R. D. V. C., ... & Valete-Rosalino, C. M. (2016). Factors associated with clinical and topographical features of laryngeal tuberculosis. *PloS one*, 11(4), e0153450.
- Gandhi, S., Kulkarni, S., Mishra, P., & Thekedar, P. (2012). Tuberculosis of larynx revisited: a report on clinical characteristics in 10 cases. *Indian Journal of Otolaryngology and Head & Neck Surgery*, 64(3), 244-247.
- Das, S., Das, D., Bhuyan, U. T., & Saikia, N. (2016). Head and neck tuberculosis: scenario in a tertiary care hospital of North Eastern India. *Journal of clinical and diagnostic research: JCDR*, 10(1), MC04.
- 4. Zhao, N., Zhang, Y., & Li, K. (2017). Rigid laryngoscope manifestations of 61 cases of modern laryngeal tuberculosis. *Experimental and therapeutic medicine*, *14*(5), 5093-5096.
- Lodha, J. V., Sharma, A., Virmani, N., Bihani, A., & Dabholkar, J. P. (2015). Secondary laryngeal

Saileswar Goswami & Dipankar Kumar Basumata., Saudi J. Med. Pharm. Sci., Vol-4, Iss-7 (Jul, 2018): 824-829

tuberculosis revisited. Lung India: official organ of Indian Chest Society, 32(5), 462.

- 6. Kiakojuri, K., & Roushan, M. R. H. (2012). Laryngeal tuberculosis without pulmonary involvement. *Caspian journal of internal medicine*, 3(1), 397.
- Agrawal, A., Qureshi, S., Kumar, A., Jadia, S., Ahlawat, B., & Prasad, S. (2016). Differential diagnosis of hoarseness of voice in the present scenario: a clinicopathological study. *Indian Journal of Scientific Research*, 7(1), 179.
- Soni, H. D., Gandhi, S., Goyal, M., & Shah, U. (2016). Study of clinical profile of benign laryngeal lesions. *Int J Med Sci Public Health*, 5(4), 656-660.
- 9. Chopra, H., & Kapoor, M. (1997). Study of benign glottic lesions undergoing microlaryngeal surgery. *Indian Journal of Otolaryngology and Head & Neck Surgery*, 49(3), 276-279.
- Hegde, M. C., Kamath, M. P., Bhojwani, K., Peter, R., & Babu, P. R. (2005). Benign lesions of larynx—A clinical study. *Indian Journal of Otolaryngology and Head and Neck Surgery*, 57(1), 35.
- Bruzgielewicz, A., Rzepakowska, A., Osuch-Wójcikewicz, E., Niemczyk, K., & Chmielewski, R. (2014). Tuberculosis of the head and neck-epidemiological and clinical presentation. *Archives of medical science: AMS*, 10(6), 1160.
- 12. van den Broek, P. (1987). Acute and chronic laryngitis; leukoplakia. *Laryngology*.
- Lucena, M. M., da Silva, F. D. S., da Costa, A. D., Guimarães, G. R., Ruas, A. C. N., Braga, F. P. B., ... & Rolla, V. C. (2015). Evaluation of voice disorders in patients with active laryngeal tuberculosis. *PloS one*, 10(5), e0126876.
- 14. Kumar, H., & Seth, S. (2011). Clinicopathological profile of hoarseness of the voice. *Internet J Otorhinolaryngol*, 13.
- Ramadan, H. H., Tarazi, A. E., & Baroudy, F. M. (1993). Laryngeal tuberculosis: presentation of 16 cases and review of the literature. *The Journal of otolaryngology*, 22(1), 39-41.
- El Kettani, N. E. C., El Hassani, M. R., Chakir, N., & Jiddane, M. (2010). Primary laryngeal tuberculosis mimicking laryngeal carcinoma: CT scan features. *The Indian journal of radiology & imaging*, 20(1), 11.