

Prevalence of Benign Vocal Cord Disorder at Dr. Soetomo General Hospital Surabaya Indonesia in June 2015-June 2016

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Abstract

Benign vocal cord disorder is a common case but its prevalence is difficult to determine. Reporting on the number of benign vocal cord disorder events is important for data management to arrange the effective management. Objective this research to determine the prevalence of benign vocal cord disorders, i.e. nodules, cysts, and vocal cord polyps. Method is a retrospective descriptive study conducted using medical record data of outpatient unit of Otolaryngology-HN division of larynx-pharynx Dr. Soetomo General Hospital Surabaya in the period of June 2015 to July 2016. Result benign vocal cord disorders consisted of 65.00% of subjects with nodules, 15.00% of subjects with polyps, and 20.00% of subjects with cysts. The ratio of male and female was 1: 1. The most age was 20-59 years old with 60.00%. The largest occupational group is professional voice user with 60.00%. The location of benign vocal cord disorders was in 1/3 of the bilateral anterior as much as 85.00%. The most frequently used therapy is non-operative with 65.00%. The conclusion benign vocal cords disorder with the types of vodal, polyps, and vocal cord cyst occurred in 4.21% of all patients with dysphonic complaints. Vocal cord nodules had the highest incidence among other types of cord vocal diseases with 2.73% while the highest prevalence was shown by vocal cord nodules with 4.42%.

Keyword: *Benign vocal cord, nodule, cyst, polyp*

Introduction

Benign vocal cord are abnormal masses of excessive and uncoordinated laryngeal tissue ¹. Benign vocal cord disorders decrease the efficiency of sound production. The voice becomes husky and *breathy*, causing patients to make more effort to talk. This leads to the patient complaining of tiredness and discomfort in the neck and throat. Patients with benign vocal cord disorder do not feel pain. The uneven surface of the vocal cords causes the mucus to get caught in the throat and cause them to react by coughing or clearing throat ².

Benign vocal cord disorder can be divided into two: neoplastic and non-neoplastic. Non-neoplastic benign vocal cord disorders include vocal cord nodules, vocal cord polyps and vocal cord cyst ³. The talkative extrovert people and those whose works require the high use of voice are at risk of benign vocal cord disorders. Other risk factors include smoking, acid reflux, allergies and infections ⁴. Benign vocal cord disorder is a common case but its prevalence is difficult to determine.

In the United States from January 2004 to December 2008, the total population was fifty-five million patients. Of the total population, the prevalence of patients diagnosed with a dysphonia is 1%, and approximately 11% of dysphonia cases in the patients are caused by a benign vocal cord disorder. Benign vocal cord disorders consist of vocal cord polyps, vocal cord nodules, vocal cord abscess, vocal cord cellulitis vocal cord granuloma, and vocal cord leukoplakia ^{4, 5}. There was never a certain rate of prevalence of benign vocal cord disorder in Dr. Soetomo general hospital. This study aims to

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determine the prevalence of benign vocal cord disorder in Dr. Soetomo General Hospital Surabaya in the period of June 2015-June 2016.

Method

The subjects of the study were dysphonic patients treated at Dr. Soetomo General Hospital Surabaya, Indonesia that met the criteria of inclusion and exclusion. The inclusion criteria included patients with symptoms of dysphonia, patients diagnosed with benign vocal cord disorders, i.e. nodules, cysts, or vocal cord polyps, and patients with complete data. The exclusion criteria excluded patients with a history of malignancy.

This is a retrospective descriptive study conducted in outpatient unit of Otolaryngology-HN, Division of Larynx-Pharynx, Dr. Soetomo General Hospital Surabaya. The study materials were medical record data of outpatient unit of Otolaryngology-HN, Division of Larynx-Pharynx, Dr. Soetomo General Hospital Surabaya from June 2015 to June 2016. Prior to conducting the study, we have undergone ethical test at Dr. Soetomo General Hospital Surabaya, Indonesia. The initial number of samples before the identification based on the criteria was 475 subjects. After passing through the process, the number of subjects that fit the criteria was 20 subjects.

The data was collected by retrieving the data of new patients who came for a rigid and flexible laryngoscope action procedure from June 1, 2015 to June 30, 2016. The patients' data were taken from the register book of larynopharyngeal division of 2015-2016 and the rigid and flexible laryngoscope report books of 2015-2016.

Patients' data included patients' identity, anamnesis, examination results, and diagnosis after rigid or flexible direct laryngoscope procedures. The collected data were arranged in tables according to age, sex, occupation, type of benign vocal cord disorder, location of benign vocal cord disorder, and the therapy given. The occupation types of the patients in this study were divided into 4 levels. Level I refers to *elite vocal performer*, i.e. singers and the radio announcers. Level II is *professional voice user*, i.e. lecturers. Level III is *non-vocal professional*, i.e. teachers, merchants, and students. Level IV is *non-vocal non-professional*, i.e. housewives and farmers. Data measurement results in this study are presented in the form of tables and descriptions ⁶.

Result

The number of female and male patients in this study was comparable with 50.00% for each group. Most patients were in the age group of 20-59 years old with 60.00%, followed by the age group of 1-9 years old with 20.00%. Most of the subjects work as teachers, traders, or students (level III occupations) with 60.00%, followed by housewives or farmers (level IV occupation) with 20.00%. Most subjects had benign vocal cord disorder in the form of nodule with 65.00% (Table 1).

Benign vocal cord disorders were grouped according to the location of the lesions, i.e. anterior 1/3 of the vocal cord, medial 1/3 of vocal cord, unilateral, and bilateral. The location of the vocal cord polyps was mostly in the anterior 1/3 of vocal cord, unilateral, with 10.00, whereas the least was found in medial 1/3 of vocal cord, unilateral, with 5.00%. In the vocal cord cysts, most vocal cords were located at anterior 1/3 of vocal cords, unilateral, with 15.00%, and the least was found in medial 1/3 of vocal cord, unilateral, with 5.00%. The location of the vocal cord nodules was mostly located at anterior 1/3 of vocal cord, bilateral, with 55.00% and the least was found at anterior 1/3 of vocal cord, unilateral, with 5.00% (Table 2). Patients with benign vocal cords were grouped according to the type of therapy given. The most prevalent treatment group was the patients treated with non-operative at 65.00% and the least one was the group of patients who did not come for further therapy with 10.00% (table 3).

Table 1. Distribution of subject's frequency

Variable	category	% n = 20
Sex	Male	50.00
	Female	50.00
age (years)	1-9	20.00
	10-19	10.00
	20-59	60.00
	≥60	10.00
Occupation Type	i	15.00
	ii	5.00
	iii	60.00
	iv	10.00
Type of benign vocal cord disorder	nodules	65.00
	Polyp	15.00
	Cyst	20.00

Table 2. Distribution of the location of benign vocal cord disorders

vocal cord location	Anterior 1/3		Medial 1/3	
	unilateral	bilateral	unilateral	Bilateral
Polyp	10.00	-	5.00	-
Cyst	15.00	-	5.00	-
Nodules	5.00	55.00	-	5.00

Table 3. Therapy group and therapy results of patients with benign vocal cord disorders

	Therapy	non-operative	operative	no control visit
Polyp	Improved	-	-	-
	remained	-	-	-
	uncontrolled	5.00	-	10.00
Cyst	Improved	-	15.00	-
	remained	-	5.00	-
	uncontrolled	-	-	-
Nodules	Improved	20.00	-	-
	remained	-	5.00	-
	uncontrolled	40.00	-	-

Discussion

Benign vocal cord disorders are less common than the malignant ones. Benign vocal cord disorder can be divided into two: neoplastic and non-neoplastic. Non-neoplastic benign vocal cord disorders are due to infection, trauma, and degeneration. Some examples of non-neoplastic benign vocal cord disorders are vocal cord nodules, vocal cord polyps, and vocal cord cysts. Vocal cord nodules are always bilateral and almost symmetrical. Stroboscope examination will show a decrease in mucosal movement (*mucosal wave*). Voice therapy will decrease or relieve vocal cord nodules. Vocal cord polyps may occur unilaterally or bilaterally with exophytic lesions that are transparent or reddish in hemorrhagic polyps. Voice therapy does not change the size of the vocal cords polyps. Vocal cords cyst may be unilateral or bilateral. The location of vocal cord cysts is near the ligaments or within the subepithelial cavity. The

subepithelial cavity is an area just below the vocal cord epithelium^{4, 7}.

In this study we found the ratio of male and female patients with same benign vocal cord disorders. The same comparison of men and women in this study suggests that the risk of vocal cord disorders is the same in both women and men. Bastian et al. explained that benign vocal cord disorders are common in women because women use excessive sound more often⁷. In the pre-menstrual period women experience *premenstrual vocal syndrome* (PMVS), described as the change of vocal cord stability due to hormonal fluctuation. PMVS is characterized by the inability to achieve high notes and the loss of power to make a voice. In this pre-menstrual period there is also a dryness of the larynx due to unbalanced estrogen and progesterone levels. A dry larynx encourages the patient to cleared his throat and this may lead to the occurrence of vocal cord nodules⁸.

The age group of patients with benign vocal cord disorders in this study was mostly 20-59 years. Another study also mentioned the same thing^{9, 10}. This explains why benign vocal cord disorders occur in patients in the working age group. The working age group consisted of individuals who actively work. This explains that patients in working age who often use voice will have a greater risk of suffering from benign vocal cord disorders^{10, 11}.

VHI (*Voice Handicap Index*) score is a questionnaire containing 30 questions about the quality of life of dysphonic patients with good validity and reliability. VHI provides information about the patient's perception on the level of sound disability in everyday life. A retrospective study by Behrman et al. proves that the level of voice needs related to lifestyle and occupation affects VHI scores. In patients with voice disorders, the higher level of the voice need leads to a higher VHI score. The high number of patients with working age in this study explains that patients in working age are in a high need of using the voice well. This also affects the VHI score. A high VHI score encourages the patients in working age to come for treatments¹².

The type of work has is closely related to the occurrence of benign vocal cord disorder. Those with the types of work requiring loud sounds with high frequencies are at risk factor for benign vocal cord disorders. The types of occupations that fall into level three tend to have the misuse of sound (*vocal abuse*) because in working, they use their voices as their primary resources without being professionally trained¹³. The types of work included in level three require moderate sound quality but high voice load¹⁴. The voice load include working hours, noisy environment, and inadequate work facilities. The excessive number of pupils in each classroom also affects the voice load of those working as teachers¹⁵.

The most common type of benign vocal cord disorders in this case is the vocal cord nodules. The similar result was obtained in another study as well⁹. Most patients with vocal cord nodules have a job in which voice becomes the primary requirement. This is why patients with a vocal cord nodules tend to come quicker for treatment compared those with other benign vocal cord disorders. Anterior 1/3 of the vocal cord is a membranous part. When the vocal cords vibrate, the membranous portion is the scene of friction and clash between the greatest vocal cords. Strong vibration

that occurs for long periods of time causes vascular congestion accompanied by swelling in the membranous part of the vocal cord. This leads benign vocal cord disorders to be more commonly encountered at anterior 1/3 of vocal cords¹⁶

In this study, one patient experienced unilateral vocal cord nodules which was due to several possibilities. In this patient the vocal cord nodules were detected very early. Thus, the possibility of reactive lesions on the contralateral side of vocal cords has not been formed yet. The facilities for vocal cord examination used in this study were rigid and flexible laryngoscopes. Rigid and flexible direct laryngoscopes have limitations in detecting benign cord vocal disorders in detail. Unilateral lesions of the vocal cord may be detected by telelaryngoscope (stroboscope) as much as 79.8% whereas rigid direct laryngoscope with general anesthesia can only diagnose as much as 60.7%¹⁷.

Non-operative therapy an effort to optimize the state of the larynx. The state of the larynx can be optimized using voice therapy by eliminating the habits that can injure the vocal cords, such as screaming or whispering, using sound with no exaggeration and optimal hydration. Other health problems associated with vocal cord irritation were also treated, such as acid reflux and control of allergies. If benign lesions of the vocal cord provide excellent response to non-operative therapy, then non-operative therapy is the best option to take^{13, 16, 3}.

Operative therapy is more intended for benign vocal cord disorders with the types of polyps and vocal cords cyst. Exophytic benign vocal cords disorders including vocal cord polyps and lesions that cause severe mucosal stiffness such as ligament cysts show poor results in non-operative therapy. Operative therapy becomes the primary choice if the patient has dysphagia associated with aspiration, has a risk of airway obstruction, and if there is suspicion of malignancy. For patients who have undergone non-operative therapy but do not get the expected results, then operative therapy can be taken into consideration. Operative therapy is also chosen if the need for voice for everyday life is very important for the patient¹³³. Non-operative treatment of the study included antibiotics, anti-inflammatory, steam inhalation, and *voice rest*. The operative therapy includes excision with rigid direct laryngoscope, excision with endoscope, and external excision. The percentage of patients treated non-operatively in the study was quite high and they

showed good results³.

Conclusion

This study was conducted at outpatient unit of Otolaryngology-NH, Division of Larynx and Pharynx, Dr. Soetomo General Hospital Surabaya from June 2015 to June 2016. There were 20 new patients with nodules, polyps, and vocal cord cysts for one year and the number was 4.21% of all patients with dysphonia complaints. Vocal cord nodules had the highest incidence among other types of cord vocal diseases with 2.73% while the highest prevalence was shown by vocal cord nodules with 4.42%.

Conflict of Interest : There is no conflict of interest

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