

**Ministry of Higher Education and  
Scientific Research  
University of Al-Qadisiyah  
College of Medicine  
Department of Community and Family  
Medicine**



## **Etiological Background of Hoarseness in Al-Diwaniyah City**

**A THESIS**

Submitted to the council of College of Medicine / University of Al-Qadisiyah in  
Partial Fulfillment of the Requirements for the Degree of Higher Diploma  
Equivalent to Master Degree in Family Medicine

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

يَوْمَئِذٍ يَتَّبِعُونَ الدَّاعِيَ لَا عِوَجَ لَهُ ۖ وَخَشَعَتِ الْأَصْوَاتُ لِلرَّحْمَنِ فَلَا تَسْمَعُ إِلَّا  
هَمْسًا

صدق الله العظيم

سورة طه .. الايه 108

## **Dedication**

**To.... My Father and Mother**

**To.... My Husband and my son Dani**

**To.... All my family members**

## **Supervisor certificate**

I certify that this thesis entitled " **Etiological Background of Hoarseness in Al-Diwaniyah City** " was prepared by " **Sura Abbas M. Ridha** " under my supervision at the College of Medicine / University of Al-Qadisiyah as a Partial Fulfillment of the Requirements for the Degree of Higher Diploma Equivalent to Master Degree in Family Medicine

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# ABBREVIATIONS

<b>Abbreviation</b>	<b>Meaning</b>
<b>AFB</b>	<b>Acid fast Bacilli</b>
<b>CBC</b>	<b>Complete blood count</b>
<b>CT</b>	<b>Computerized tomography</b>
<b>DNA</b>	<b>Deoxyribo Nucleic acid</b>
<b>EBV</b>	<b>Ebestien-bar virus</b>
<b>ENT</b>	<b>Ear, Nose, and Throat</b>
<b>EXM</b>	<b>Extra cellular matrix</b>
<b>GA</b>	<b>General anesthesia</b>
<b>GERD</b>	<b>Gastroesophageal reflux</b>
<b>HA</b>	<b>Hyaluronic acid</b>
<b>MRI</b>	<b>Magnetic resonance imaging</b>
<b>RAP</b>	<b>Recurrent adult papillomatosis</b>
<b>RJP</b>	<b>Recurrent juvenile papillomatosis</b>
<b>RLN</b>	<b>Recurrent laryngeal nerve</b>
<b>RLNP</b>	<b>Recurrent laryngeal nerve paralysis</b>
<b>RRP</b>	<b>Recurrent respiratory papillomatosis</b>
<b>TB</b>	<b>Tuberculosis</b>
<b>TFT</b>	<b>Thyroid function test</b>
<b>VCD</b>	<b>Vocal cord dysfunction</b>
<b>VFP</b>	<b>Vocal fold paresis</b>
<b>SLN</b>	<b>Superior laryngeal nerve</b>

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# **Abstract**

## **Background**

Hoarseness is defined as a change in the quality of the voice, perceived as rough, harsh, and breathy voice due to incompletely closed vocal cord or defect in neuromuscular control of larynx. <sup>(1)</sup> It is a symptom not a diagnosis, and therefore warrants a careful determination of the underlying cause in every case. <sup>(2)</sup>

## **Objective**

This study was designed to identify different causes of hoarseness regarding age, gender, residence occupation and effect of smoking and voice abuse on the development of laryngeal pathology that is presented as hoarseness and put strategy to decrease them.

## **Method:**

Observational cross sectional study, 125 patients presented with hoarseness were evaluated prospectively in ENT clinic of Al-Diwaniyah teaching hospital from 2-April-2018 to 2-July-2018.

## **Result:**

(56.8 %) of patients presented with hoarseness are males, and (43.2 %) are females, mean age of male and female patients was about 42 years, the commonest cause of hoarseness in male was acute laryngitis in (15.5%) of them, while commonest cause of hoarseness in female is chronic laryngitis; in (22.2 %) of them.

Patients presented with acute hoarseness are 39 out of 125 (31.2 %), and the acute laryngitis is most common cause of their presentation 19 patients (15.2 %), 86 patients out of 125 ( 68.6%) presented with chronic hoarseness, the chronic laryngitis is the most common cause of their presentation 22 patients (17.6%).

The main other presenting clinical feature in addition to hoarseness is sore throat ( in 68.8 % of patients).

The commonest cause of hoarseness among smokers is laryngeal tumor (19% ), P value < 0.001 .

While in non smokers, the vocal strain is the commonest cause of their hoarseness (19.4 %), P value 0.018, vocal strain is also a common cause of hoarseness in patients with history of voice abuse (22.9%).

Chronic laryngitis is the commonest cause of hoarseness in patients from urban areas (20.3%), it is also the most common cause of hoarseness in non-voice abuse patients (20%), the acute laryngitis is the commonest cause of hoarseness in patients from rural areas (15.2%).

Both chronic laryngitis and laryngeal papillomatosis are the main causes of hoarseness in patients between 1-10 years old.

Both Chronic laryngitis and laryngeal cancer are common cause of hoarseness in persons > 60 years old.

Regarding the occupation, the hoarseness is more common among workers who abuse their voice (sellers, drivers and barbers) followed by housewives.

### **Conclusions:**

1-The mean age of both males and females in this study was 42 years at presentation

2-The Peak incidence of hoarseness in age group 31-40 years

3-The most common cause of hoarseness was chronic laryngitis, which predominantly affects the patients from the urban areas.

4- The males are affected more than females by laryngeal disease that present as hoarseness of the voice.

5-Laryngeal cancer is more common in male, elderly, and smokers.

6-The most common occupational group with hoarseness are workers (drivers of taxi and micro-bus , salesmen and barbers) and housewives.

# **Chapter One**

## **Introduction and Aim of Study**

## **Introduction**

### **What is hoarseness ?**

Hoarseness is defined as a change in the quality of voice perceived as, rough, harsh, or breathy voice, which is caused by abnormal vocal cord movement <sup>(1)</sup>. It is a symptom not a diagnosis, and therefore warrants a careful determination of the underlying cause in every case<sup>(2)</sup>.

### **Mechanism of Phonation**

The larynx located in the anterior part of the neck (also known as voice box), it is made up of several supporting cartilages, ligaments and contains vocal folds. In order to produce a normal voice, exhaled air moves out of the lung and passes upward through the vocal tract, at level of the larynx, the exhaled air causes the vocal folds to move toward the midline of tract (Adduction). The adducted vocal folds don't close completely but remain partially open. The narrow opening between the folds is referred as glottis <sup>(3)</sup>

As air moves through the glottis, it causes a distortion of the air particles which makes the vocal folds to vibrate that lead to produce phonation or voice.

Dysphonia is an impairment in the ability to produce an appropriate level of phonation. More specifically, it results from an impairment in vocal fold vibration.<sup>(4)</sup>

### **Causes of Hoarseness :**

The causes of hoarseness range from viral infection to a serious pathology like malignancy. <sup>(5)</sup>

According to the onset, Hoarseness can be classified into acute and chronic. <sup>(6)</sup>

**Acute onset hoarseness** is commonly seen, which is usually associated with upper respiratory tract infection such as laryngitis, vocal abuse, smoking, laryngeal trauma and thyroid surgery. <sup>(7)</sup>

Acute laryngitis is the commonest cause of hoarseness<sup>(8)</sup>. Most cases of acute hoarseness improve with conservative therapy such as vocal hygiene, voice rest

and medication. All of these patients may not require laryngoscopic examination as these cases usually do not progress. However, hoarseness that lasts for longer than 3 weeks should be evaluated thoroughly.<sup>(9)</sup>

**Chronic or persistent hoarseness** can be caused by vocal nodule, vocal cord polyp, vocal abuse, functional dysphonia, laryngeal neoplasms, respiratory papilloma, GERD, post nasal secretion, thyroid tumors, and lung granulomatous diseases such as TB and systemic diseases such as hypothyroidism and diabetes mellitus.<sup>(10,11)</sup>

Also voice disorders can be divided into 2 major categories : organic and functional.<sup>(12)</sup>

Hoarseness is more common in certain professions such as teachers, singers, salesmen, leaders and preachers who have excessive use and misuse of voice. Young children who have habit of excessive talking or screaming frequently suffer from this problem.<sup>(13)</sup>

Initial response to patients presented with hoarseness by general practitioners differ according to whether the disorder they have is benign or malignant, acute or chronic. if the hoarseness has not improved in two weeks or more, the patient has to be referred to ENT specialist. Loosely examining a patient without looking at the larynx can result in malignancies such as laryngeal cancer and thyroid cancer being overlooked<sup>(14)</sup>.

**Aim of study:**

1-To recognize the causes of hoarseness among patients presented to ENT department at Al-Diwaniyah teaching hospital.

2-Evaluate the multiple causes of hoarseness across gender, age, residence, duration, and occupation .

3-Evaluate the influence of smoking and vocal abuse on consequences of hoarseness.



**Chapter Two**  
**(Literature review)**  
**Anatomy, Physiology,**  
**Embryology and Etiology of**  
**Hoarseness**

## Chapter Two- A:

### 2.1 Anatomy of larynx:

#### Position of larynx in neck;

The larynx is suspended posteriorly at the base of skull by the constrictor muscles and attached anteriorly to the hyoid bone and mandible by the thyrohyoid, digastrics, stylohyoid, geniohyoid and mylohyoid muscles. <sup>(15)</sup>



Fig 2.1 <sup>(16)</sup>

Position of the larynx in the neck

#### Innervation of the larynx:

The sensory and motor nerve supply of the larynx originates bilaterally from the vagus nerve. Although the recurrent laryngeal nerve (RLN) provides the sensory supply to the infraglottis, its main function is to provide the motor supply to the intrinsic laryngeal muscles. The superior laryngeal nerve (SLN) predominantly provides the sensory supply to the supraglottis and glottis, but its external branches also provides the motor supply to the cricothyroid muscle. The ansa Galeni, an anastomosis between the SLNs internal branch and one of the RLNs branches, provides the accessory motor and predominant sensory supply to endolaryngeal structures. <sup>(17)</sup>

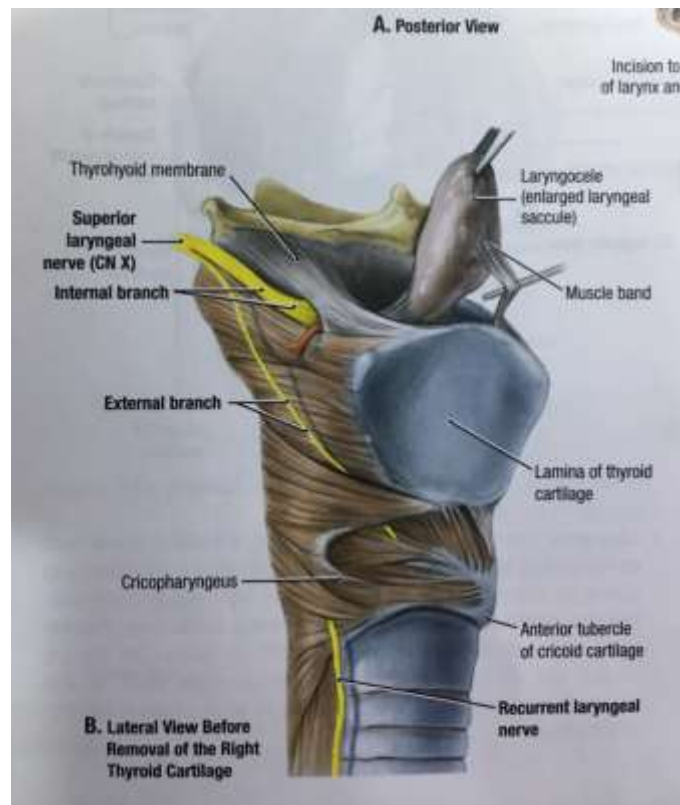


Fig 2.2<sup>(16)</sup>

### Nerve supply of the larynx

#### **Vascular supply of larynx :**

The arterial supply to the larynx comes from the superior and inferior laryngeal arteries; the venous supply mirrors the arterial supply . The superior laryngeal artery is a branch of the superior thyroid artery, which arises directly from the external carotid artery, the superior laryngeal artery branches from the superior thyroid artery at the level of the hyoid bone. This artery then courses medially with the internal branch of the superior laryngeal nerve and inter the thyrohyoid membrane . The cricothyroid artery, one of the major branches of the superior laryngeal artery, runs along the inferior surface of the thyroid cartilage to supply it similarly named muscle and joint.

The second major arterial supply to the larynx come from inferior laryngeal artery, a branch of inferior thyroid artery. This artery inters the larynx between fibers of the inferior constrictor muscle and anastomosis with branches of the superior laryngeal artery. <sup>(18)</sup>

## Skeleton of the larynx

The skeleton of the larynx consists of cartilages, joints, ligaments and membranes. There are **three single cartilages** thyroid, cricoids and epiglottic, **three pairs of cartilages** arytenoids, corniculate and cuneiform and **three pairs of joints** (cricothyroid, cricoarytenoid and arytenocorniculate ).

The **ligaments and membranes** can be classified into **extrinsic** thyrohyoid membrane and cricotracheal, hyoepiglottic, thyroepiglottic ligaments and **intrinsic** quadrangular membrane and cricothyroid ligament.

The all- important vocal folds (vocal cords) are formed from the upper part of the cricothyroid ligament (cricovocal membrane ).<sup>(19)</sup>

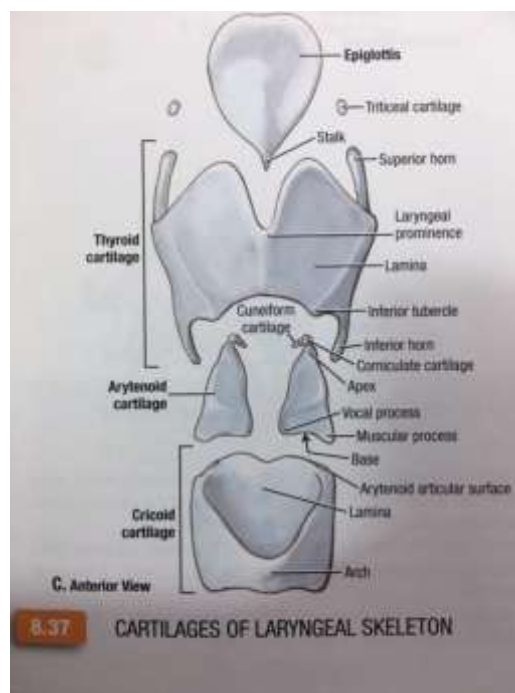


Fig 2.3<sup>(16)</sup>

## Skeleton of the larynx

### Cartilages

The thyroid, cricoids and arytenoids cartilages are composed of hyaline cartilage; with age, parts of them may calcify or ossify. The epiglottic, corniculate and cuneiforms are of elastic fibrocartilage.

## **The thyroid cartilage**

It consists of two conjoined laminae whose posterior borders are free and projected upwards and downwards as the superior and inferior horns. The site of union of the two laminae anteriorly forms the laryngeal prominence ( **Adam's apple**).

## **The cricoid cartilages**

It is the foundation of larynx; to this signet-ring structure, the thyroid and arytenoids cartilages are articulated by the synovial joints. It is the only complete cartilaginous circle in the whole of the air passages.

## **The Epiglottic cartilage**

It is a slightly curled, leaf-shaped structure, prolonged below into a slender process ( the stalk of the leaf). Attached in the midline to the thyroid cartilage under the notch in its upper border.

## **The arytenoid cartilages**

It articulate with the superior part of the lamina of the cricoids , and give the attachment to the vocal folds and various laryngeal muscles. Each has a shape of a gracefully curved pyramid, with at the base a forward projection of the vocal process" attached to the vocal fold, and a lateral projection the muscular process. The superior process of the arytenoids articulates with the very small and nodular corniculate cartilage to which is attached the aryepiglottic fold.<sup>(19)</sup>

## **Joints**

Cricothyroid joint

Cricoarytenoid joint

Arytenocorniculate joint

## **Ligaments and membranes**

**The extrinsic membranes**, the thyrohyoid membrane, the midline part is thickened as the median thyrohyoid ligament, and the posterior free borders form the lateral thyrohyoid ligaments, the thyrohyoid membrane make the lateral wall

of the piriform recess and is penetrated by internal laryngeal nerve and superior laryngeal vessel.

It is not part of the larynx, but anchors the skeleton of the larynx to the hyoid bone.

The epiglottis is attached to the sides of the arytenoid cartilages by the aryepiglottic folds of mucous membrane, to the tongue by the median glossoepiglottic fold, and to the pharynx by lateral glossoepiglottic folds. The epiglottic cartilage is connected to the hyoid bone and thyroid cartilage by the hyoepiglottic and thyroepiglottic ligament .

The cricotracheal ligament is the name given to the tissue that connects the lower boarder of cricoids Cartilage to the first cartilaginous ring of the trachea .<sup>(19)</sup>

**The intrinsic membranes**, the quadrangular membrane, its lower boarder is free, constituting the vestibular fold, formerly known as the (false vocal cord), it's upper boarder much longer than false cord, constitute the aryepiglottic fold at the inlet of the larynx. The other intrinsic membrane is the cricothyroid ligament. The middle part ( median cricothyroid ligament). The much more important lateral part ( lateral cricothyroid ligament or triangular membrane ), including elastic fibers, is often and better known as the cricovocal membrane .<sup>(19)</sup>

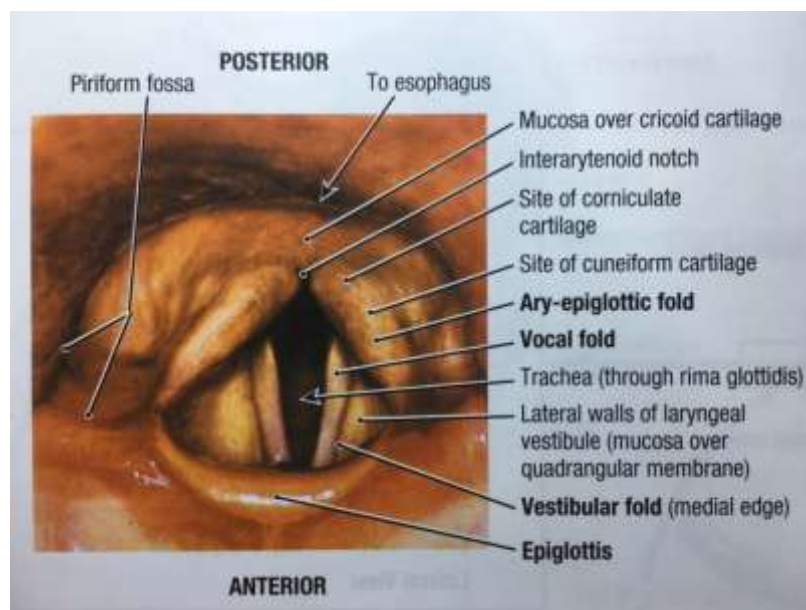


Fig 2.4<sup>(16)</sup>

Normal laryngoscopic examination

## **Muscles of larynx:**

### **Intrinsic muscles**

They are best considered in two groups :those that change the size and shape of the inlet, and those that move the vocal folds. The muscles that form a sphincter for the inlet are the aryepiglottic and oblique arytenoids muscles, assisted by transverse arytenoid, muscles. Those responsible for phonation by moving the vocal folds are the posterior and lateral cricoarytenoids, thyroarytenoids and vocalis, transverse arytenoids and the cricothyroids. <sup>(21)</sup>

### **Muscles of the inlet:**

Aryepiglottic muscle, Oblique arytenoids muscle, Thyroepiglottic muscle.

### **Muscles of the vocal folds:**

Posterior cricoarytenoid muscle is the most important single muscle in the larynx and perhaps in the whole body, since it is the only abductor of vocal cords, lateral cricoarytenoid muscle, transverse arytenoids muscle, cricothyroid muscle, thyroarytenoid muscle, vocalis muscle.

These have easy names , determined by the cartilages to which they are attached. They work in opposing groups, the only movements they impart to the vocal folds are :

1-opening and closing

2-lengthening and shortening, with or without tensing and relaxing.

The opening and closing movements, usually called "abduction and adduction of the vocal folds", occur at the cricoarytenoid joints. Abduction is produced by the posterior cricoarytenoid which has two distinct actions, each of which is opposed by a separate adductor muscle, the lateral cricoarytenoid and the transverse arytenoids. <sup>(19)</sup>

### **Extrinsic muscles:**

The larynx moves upwards during the act of swallowing and afterwards returns to the position of rest. Two opposing groups of muscles exist, the one elevating and the other depressing the larynx. <sup>(19)</sup>

## **2.2 Physiology:**

### **-laryngeal functions :**

Lower airway protection, respiration and phonation .

The most primitive of the laryngeal function is protecting of the airway . In humans, the larynx is a highly complex and specialized organ, not only for airway protection and control of respiration, but also for sound and speech production .

The larynx has evolved out of several important reflexes for the airway protection against external stimuli and foreign bodies. These reflex mechanisms are relayed by the mucosal (sensory afferent ), Myotatic and articular receptors of the larynx via both the superior and recurrent and laryngeal nerves .

The strongest laryngeal reflex is that of laryngeospasm – a response to mechanical stimuli. The larynx has also evolved reflexes that produce cough, apnea , Bradycardia , and hypotension .<sup>(18)</sup>

### **Phonation :**

The most complex and highly specialized function of the laryngeal is sound production. The ability to couple phonation with articulation and resonance allows for human speech .

Sound production requires adequate breath support to produce sufficient subglottic pressure. There also must be adequate control of the laryngeal musculature to produce not only glottis closure, but also the proper length and tension of the vocal folds .

Finally, there must be a vibratory capacity of the tissues of the vocal folds. Once these conditions are met, sound is generated from vocal folds vibration .

In a fine –wire electromyographic study of human larynges, it was found that the intrinsic laryngeal muscles are not only highly specialized for their particular vector of action, but they are also controlled for the timing of onset of contraction and the degree of recruitment and fade during phonation .

The thyroartenoid and the lateral cricoartenoid muscles have been shown to exhibit burst-like activity at the onset of phonation ( as well as prephonatory ), with a measurable degree of fade during sustained phonation. The interartenoid muscle,



has been shown to have increased latency of contraction, but regular sustained tonicity during prolonged sound production. The cricothyroid seems to have the greatest measurable action with increase in pitch and volume, while the posterior cricoarytenoid shows its greatest degree of activation with voluntary deep inhalation and sniff functions .

Accessory effects such as lung capacity, chest wall compliance, pharyngeal, nasal, and oral anatomy, and subsequent mental status also play a role. The process begins with inhalation and subsequent glottal closure. An increase in subglottic pressure follows until the pressure overcomes the glottal closure force and air is allowed to escape between the vocal folds. Once air passes between the vocal folds, the body-cover concept of phonation takes effect. The body-cover theory describes the wave-like motion of the loose mucosa of the vocal folds over the stiffer, more densely organized vocal ligament and vocalis muscle. This motion is known as the mucosal wave. The wave begins infraglottically and is propagated upward to the free edge of the vocal fold and then laterally over the superior surface. Eventually, the inferior edge becomes reapproximated due to drop in pressure at the open glottis, and to the elastic recoil of the tissues themselves. The closure phase is also propagated rostrally. With the vocal folds fully approximated, subglottic pressure may again build and the cycle is repeated.<sup>(18)</sup>

## **2.3 Embryology**

Development of larynx occurs during 4<sup>th</sup> week of intrauterine life, and is closely associated with the development of trachea. Development of larynx starts as a ventral groove in the pharynx known as the laryngotracheal groove. This groove deepens and its edges fuse to form a septum which separates the laryngotracheal tube from the pharynx and esophagus.

This process of fusion starts caudally and extends cranially. This tube is lined with endoderm from which the epithelium of airway develops. The cranial end of this laryngotracheal tube forms the larynx and trachea, while the caudal end bifurcates to produce the two main bronchi. This is also the place from which the two lung buds develop. Because of the development of the larynx, trachea and esophagus are interlinked, any congenital malformation of esophagus is always associated with a certain degree of malformation of larynx and trachea.

Larynx develops from the cranial part of laryngotracheal groove. It is bounded superiorly by the caudal part of hypobranchial eminence and laterally by ventral

folds of 6<sup>th</sup> branchial arches. Epiglottis develops from hypobranchial eminence. Arytenoids develop on either side of laryngotracheal groove, and as they enlarge they become approximated with each other and to the caudal portion of hypobranchial eminence. This development converts the vertical slit of laryngeal cavity into a T shaped one.

The nerves supplying the 4<sup>th</sup> and 6<sup>th</sup> branchial arches also supply larynx (superior and recurrent laryngeal nerves).

#### Development of laryngeal cartilages

Name of cartilage	Developed from
Thyroid cartilage	ventral end of 4 <sup>th</sup> arch cartilage
Arytenoids	6 <sup>th</sup> arch cartilage
Corniculate	6 <sup>th</sup> arch cartilage
Epiglottis	hypobranchial eminence
Cricoids and tracheal Cartilages	6 <sup>th</sup> arch cartilage. <sup>(20)</sup>

## Chapter Two –B: Etiology of Hoarseness

Hoarseness is one of the most important symptoms in ENT clinic and it is an early manifestation of a condition directly or indirectly affects the larynx.

Hoarseness is abnormal production of voice, prescribed as rasping, breathiness, harshness, vocal tension or lower pitch voice.

### **Pathophysiology of hoarseness:**

1-Inadequate glottis closure .

2-Alterations in vocal cord elasticity .

3-Incoordination in mechanical properties of 2 vocal folds which lead to impairment of vibration.<sup>(21)</sup>

### **Etiology:**

Many reasons lead to abnormal vibrations of the vocal folds, these causes are classified into five basic categories:

1- **Neoplastic:** abnormal growth of the vocal fold tissue, Cysts, polyps, Nodules and Carcinoma.

2-**Inflammatory:** Alterations in the vocal fold due to inflammation, allergy, infection, GERD, Smoking, Trauma and Voice over use.

3-**Neuromuscular:** Disturbance in the structures of the nervous system that control laryngeal function, multiple Sclerosis, Myasthenia Gravis, Parkinson's disease, Spasmodic Dysphonia and nerve injury.

4-**Systemic Diseases:** Is manifested as hoarseness, Acromegaly, Amyloidosis, Hypothyroidism, and Sarcoidosis.

5-**Technical:** related to poor muscle function or psychological stress, with no physiological findings in the larynx, voice misuse, and Vocal strain<sup>(22,23,24)</sup>

## **2.1 Laryngitis**

Laryngitis is inflammation of larynx (voice box). It is classified as acute if it persists less than 3 weeks and chronic if symptoms persist more than 3 weeks. Acute cases occur due to a viral infection<sup>(25)</sup>, chronic cases that occur due to cigarette smoking, tuberculosis, allergies, GERD, rheumatoid arthritis and sarcoidosis.<sup>(25,26)</sup> The symptoms often include a hoarse voice, cough, sore throat and painful swallowing.<sup>(27)</sup>

### **A) Acute Laryngitis:**

It occurs due to :

1-Viral infection : Rhino viruses, Adenoviruses, Influenza viruses, and Para influenza viruses .

2-Bacterial infection : may coexist with viral infection :

Haemophilus influenzae Type B, Streptococcus pneumonia, Staphylococcus aureus, Group B beta haemolytic streptococci, Moraxella catarrhalis and Klebsiella, pneumonia less common mycobacterial and syphilis infection .

3-Fungal infection :

Candidiasis

The risk factors include: Immunosuppression and the use of steroid inhalers<sup>(25)</sup>

4-Trauma

other causes of laryngitis occur due to voice abuse<sup>(28)</sup>, like excessive yelling, screaming, singing though this usually result in damage of the vocal folds, the process of healing may result in alters the structures of the fold.<sup>(25)</sup>

Laryngeal trauma, including iatrogenic (endotracheal intubation), can also cause inflammation of vocal cords.<sup>(29)</sup>



Fig 2.5 <sup>(25)</sup>

Acute laryngitis

***B)Chronic laryngitis :***

Allergy ;Allergic rhinitis and asthma, GERD, trauma and smoking <sup>(30)</sup>

Autoimmune disease – Chronic laryngitis may be a feature of systemic disease such as Rheumatoid arthritis, systemic lupus erythematosus, amyloidosis ,Sarcoidosis .

Investigations:

CBC, Tests for syphilis and TB if clinically indicated. <sup>(31)</sup>

Indirect or direct laryngoscope.

Video stroboscopy, useful in diagnosis vocal cysts, polyps and nodules <sup>(32)</sup>

**2.2Gastroesophageal reflux:**

Gastro-esophageal reflux is defined as the effortless passage of gastric contents from stomach to the esophagus without associated belching, vomiting. It is a normal physiological process. GERD is a pathological condition which may affect the oropharynx, larynx, and respiratory tract and has found to be associated with pulmonary and otolaryngeologic symptoms. These are known as atypical esophageal manifestations of GERD. <sup>(33)</sup>

Reflux may lead to laryngospasm and vocal cord dysfunction (VCD). Patients with GERD presented with hoarseness, chronic cough, frequent throat clearing, lump sensation in throat and non-specific swallowing difficulties. <sup>(34,35)</sup>

### **2.3 Benign vocal fold lesions:**

voice production needs to coordinate function of larynx, imbalance of this system can affect voice production. Benign lesions of vocal folds, which can result in varying degrees of dysphonia. they represent a common problem in ENT clinic." <sup>(36)</sup>

A lesion is considered benign when it remains localized, don't separate to other sites, and will be respond to surgery. The common benign lesions of the larynx are: vocal cord nodules, vocal cord polyp, laryngocele, laryngeal web, epiglottic cyst, subglottic hemangioma, the common site of the benign lesions of larynx are vocal cords, anterior commissure, false cord, epiglottis, and aryepiglottic folds. <sup>(37)</sup>

The most important risk factors leading to the development of benign lesions are vocal abuse, misuse, over use, exposure to the various irritant like smoke, dust, fumes, alcohol, etc.

Allergy and infectious conditions of larynx (as human papilloma virus )are also responsible for the development for such lesions. <sup>(38)</sup>

#### **A)Vocal polyps:**

Vocal polyps can be sessile or pedunculated, unilateral or bilateral. They occur commonly at the free edge of the vocal fold characterized as edematous, hyaline or mixed. <sup>(39)</sup>. it affect adults who overused their voice <sup>(40)</sup>, such as, teachers who are also at higher risk of vocal fold cysts and nodules <sup>(41)</sup>, the typical histological features are found in the lamina propria, such as edematous changes, increased capillaries and inflammation are characteristics. <sup>(40)</sup> similar histological changes can occur in vocal fold nodules and Reinke's edema <sup>(42)</sup>, in addition to repetitive trauma, other causes that may lead to polyp formation such as airway infections, allergies, nicotine, Gastroesophageal reflux <sup>(40)</sup>, the size and location of the polyps is directly correlated to the voice quality. <sup>(43)</sup>

## **B)Vocal nodules:**

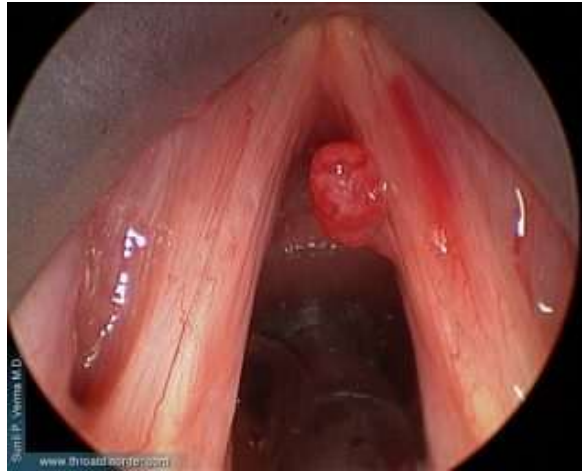


Fig 2.6 <sup>(44)</sup>

### **Vocal cord nodule**

vocal nodules ( e.g. singer's nodes) are the consequence of functional voice disorders, also caused by vocal abuse or misuse. Typically these nodules occur in the middle third of the vocal fold and located superficially on the vibrating free edge<sup>(44)</sup>.

Pathogenesis of vocal nodules is due to the disproportionately high mechanical shear on the free edge of vocal fold which damages the superficial layer of the lamina propria and results in micro-vascular changes in the middle third of the fold. With time, it results in remodeling of the tissue with epithelial hyperplasia, leading to typically circumscribed lesions in the vocal folds. On histological examination, thickening of the basement membrane and an edematous swelling of the lamina propria are characteristic.<sup>(45)</sup>

It is often difficult to diagnose different lesions of the lamina propria histologically ( e.g. Nodules, polyps and Reinke's edema). <sup>(46)</sup> Therefore, the correct diagnosis cannot be made purely on histological examination, but requires a complete assessment including history, voice assessment and laryngoscopic\stroboscopic findings.<sup>(47)</sup>

### **C) Reinke's edema (Smoker's larynx)**

Reinke's edema is the swelling of the vocal cords due to fluid (edema) collected within the Reinke's space <sup>(48)</sup>, The Reinke's space is a gelatinous layer of the vocal cord located underneath the outer cells of the vocal cord. <sup>(49)</sup> When a person speaks, the Reinke's space vibrates to allow for sound to be produced

(phonation). The Reinke's space is sometimes referred to as a superficial lamina propria.<sup>(50)</sup>

The swelling of the vocal folds leads to a deep and hoarse voice. Therefore, the major symptom of Reinke's edema is a hoarseness. The major cause associated with Reinke's edema is Smoking. 97% of patients diagnosed with Reinke's edema are habitual smokers. Other risk factors include voice abuse, gastroesophageal reflux, and hypothyroidism.<sup>(51)</sup>

### **Common symptoms:**

\*Sac- like appearance of the vocal fold.<sup>(52)</sup>

\*Hoarseness and deepening of the voice.<sup>(53)</sup>

\*Dysphonia.<sup>(51)</sup>

\*Shortness of breath (Dyspnea).<sup>(54)</sup>

### **Diagnosis:**

Reinke's edema is diagnosed by ENT specialist by review the patient's history and symptoms such as hoarseness, dysphonia, and reduce vocal range. examination of the vocal cord, Reinke's edema is associated with heavy smoking, vocal cord will be visualized using laryngoscopy and endoscopy.<sup>(53)</sup>

## **2.4 Recurring papillomatosis :**

There are 2 types of recurrent papillomatosis:

Juvenile (RJP) and adult ( RAP) forms of recurring papillomatosis are distinguished. RJP usually arises between the age of 2-4 years and is the major cause of hoarseness in childhood.<sup>(55,56)</sup> It occurs due to human papilloma virus (HPV), the most important of which are HPV 6,11,16, and 18.<sup>(55,57)</sup> Hoarseness is the cardinal symptom and RAP occurs at age 20 and 40 years.<sup>(58)</sup>

## **2-5 Laryngeal cancer:**

The laryngeal cancer is the second most common head and neck cancer, more common among men. Conservative surgery and radiotherapy offers equal cure rate in its early stage although radiotherapy is more popular across the world. For intermediate and advanced staged tumors, total laryngectomy with postoperative radiotherapy was the standard for cure.<sup>(59,60,61,62)</sup>





**Fig 2.7** <sup>(59)</sup>

Laryngeal cancer

## **2.6 Hypothyroidism :**

Auto immune hypothyroidism (Hashimoto thyroiditis) is the most common cause of hypothyroidism, symptoms of a hypothyroid state include dry skin, hoarseness, deep voice, bradycardia, prolonged relaxation in the refluxes ,proximal muscle weakness, carpel tunnel syndrome, fatigue, constipation, and cold intolerance.<sup>(63)</sup>

## **2.7 Thyroid lymphoma :**

Hoarseness is an unusual presentation of primary thyroid lymphoma with laryngeal infiltration.

Primary thyroid lymphoma is a rare disease of the thyroid gland <sup>(48)</sup>, the thyroid lymphoma are more common in women than men, the main symptom is a rapidly enlarging thyroid mass, patients manifest compression symptoms of adjacent structures in addition to dysphagia, stridor, hoarseness, cough, and a pressure sensation in the neck. <sup>(64,65)</sup>

The most common histopathological type of thyroid lymphomas is non-Hodgkin's lymphoma with B cell origin. Hodgkin's disease and T cell lymphoma are rare tumors.<sup>(66)</sup>

## 2.8 Spasmodic dysphonia

Spasmodic dysphonia, also known as laryngeal dystonia, is a disorder in which the muscles of larynx become spastic.<sup>(67,68)</sup>

### Signs and symptoms

Symptoms of spasmodic dysphonia typically occurs in middle age group people, But they have also been seen in people in their twenties, with symptoms may emerging as young as teenage years<sup>(69)</sup>, women are more commonly affected<sup>(67)</sup>, Severity is variable between people.<sup>(68)</sup>

### Causes:

The exact cause of spasmodic dysphonia (Laryngeal dystonia ) is unknown, genetic and neurological pathogenic factors have been proposed in recent research.<sup>(70)</sup>

### Risk factors include:

Being female, middle age group, family history of neurological disease  
stressful events, upper respiratory tract infections, voice abuse,  
childhood measles or mumps, and pregnancy.<sup>(71)</sup>

Spasmodic dysphonia is a neurological disorder rather than a disorder of the larynx<sup>(72)</sup>,so it is classified as neurological disorder<sup>(73)</sup>, some practitioners believe it to be psychogenic.<sup>(74)</sup>

### Diagnosis

Diagnosis of spasmodic dysphonia requires a multidisciplinary team.<sup>(75)</sup>

A team of professionals including a speech – language pathologist, an otolaryngologist, and a neurologist, is typically involved in spasmodic dysphonia assessment and diagnosis.<sup>(76)</sup>Speech-language pathologist conducts a speech assessment including case history to get information about voice use and symptoms. Following speech assessment, the otolaryngologist conducts a trans nasal laryngoscopy to view the vocal folds and activity of muscles controlling them in order to exclude other possible causes of the voice disorder<sup>(75)</sup>, to evaluate the patient for any other neurological problems, this examination is followed by an assessment by the neurologist.<sup>(76)</sup>

## **2.9 Hoarseness after surgery**

### **A) Hoarseness after thyroidectomy:**

Hoarseness is one of the most common complications following an operative procedure of the thyroid gland. The recurrent laryngeal nerve (RLN) can be damaged by retraction, since it lies within the tracheoesophageal groove, as well as by thermal injury or dissection.

Clinical manifestations range from mild symptoms of hoarseness, loss of effective cough mechanism and upper pharyngeal dysphagia with aspiration in cases of ipsilateral injury, to life threatening airway obstruction from bilateral RLN injury.<sup>(77,78,79,80)</sup> This functional, "subjective" post thyroidectomy syndrome, which includes a broad spectrum of symptoms among patients, is of great concern since severe thyroid surgery complications may be connected with profound medicolegal implications.<sup>(77, 78)</sup>

### **B) Hoarseness in non-thyroid surgery:**

Complications after cervical spine procedures demonstrated a rate of RLNP of nearly 25%, with 8% being clinically symptomatic and 15.9% detected via laryngoscopy.<sup>(79)</sup>

The morbidity of RLN palsy is high during some thoracic operations<sup>(80)</sup>, the incidence is around 31% among patients undergo left lung resection for cancer<sup>(81)</sup>, the rate of hoarseness after mediastinoscopy has been generally reported at less than 1%.<sup>(82)</sup>

The incidence of hoarseness in open-heart surgery is 1-2%.<sup>(83)</sup>

### **C) Hoarseness due to intubation**

Vocal cords can be injured during the intubation-extubation procedures as well, the end result of this injury-related vocal cord dysfunction is hoarseness, difficult to differentiated between the damage done by thyroid surgery and anesthesia in most cases.<sup>(84)</sup>

Partial palsy of the RLN due to intubation would be associated with sever dysphonia or aphonia and not with dyspnea because of the typical intermediate position of the paralyzed vocal folds.<sup>(85)</sup>

The risk factors for vocal fold injury caused by intubation are cuff pressure<sup>(86)</sup>, size of the tube, movement of the tube and duration of intubation.<sup>(87)</sup>

Demonstrated a bilateral VCD in a non-head and non-neck-related surgery which was attributed to over extension of the neck during intubation. one possible pathophysiology explanation regarding this clinical presentation could be the compression of the nerve, especially the anterior branch of RLN.<sup>(88)</sup>

As regards the effect of duration of surgery on the incidence of hoarseness, stated that increased duration of surgery led to an increased incidence of hoarseness, mainly because of mucosal damage caused by the endotracheal tube.<sup>(89)</sup>

The most common finding was thickening of the mucosa in the posterior parts of the vocal folds, followed by hematoma. Whether these alterations are caused by laceration.<sup>(90)</sup>

### **D/Post intubation Granuloma**

The incidence of post intubation granuloma is 1:20000<sup>(91)</sup>. The symptoms include persistent cough, hoarseness of voice, intermittent loss of voice, sore throat, lump sensation or tension in throat, referral otalgia and occasional hemoptysis are following GA. Patient may presented with respiratory obstruction. Some patients recover by giving rest to the voice. Persistent symptoms following intubation warrants laryngeal granuloma. Post intubation granuloma usually follows endotracheal anesthesia, prolonged intubation along with mechanical ventilation.

In 75 % of patients it is unilateral and in remaining 25% it is bilateral. It always arises from the medial surface of vocal process of arytenoids is most common site of injury caused by the endotracheal tube as it is positioned between the vocal cords. Usually it is detected 2-4 weeks after surgery under GA. Long standing small pedunculated granuloma may heal spontaneously or may be coughed out.<sup>(92)</sup>

### **2.10 Recurrent laryngeal nerve paralysis**

Recurrent laryngeal nerve paralysis, also called (vocal fold paralysis or paresis) recurrent laryngeal nerves(RLNs), which control all muscle of the larynx except for the cricothyroid muscle. The RLN is important for vocalization, breathing and swallowing.<sup>(93)</sup>

## **Classification**

**A)Vocal cord paresis:** refers to a partial loss of input to the nerve of the vocal folds, this lead to reduced vocal fold mobility<sup>(94,95)</sup>, the severity of the paresis can range from minor to major loss of vocal fold mobility.<sup>(96)</sup>

**B)Vocal fold paralysis:** is the total loss of vocal fold mobility due to a lack of neural input to the vocal folds, these conditions result from damage to the laryngeal nerve

Superior laryngeal nerve(SLN) damage, can also lead to vocal fold paresis, SLN is responsible for sensory input to the vocal folds.<sup>(95)</sup>

### **Symptoms:**

-Symptoms of vocal fold paresis from RLN damage include

Rough Voice , Breathly quality of the voice , Difficulty speaking loudly<sup>(97)</sup>

-Symptoms of vocal fold paresis from SLN damage include

Chronic cough, Globus sensation, loss of voice in high pitch range<sup>(94)</sup> and Painful vocalization<sup>(96)</sup>

### **Causes:**

There is a wide variety of causes of vocal fold paresis, including congenital, infectious, malignancies, traumatic, endocrinologic, and neurologic disease.<sup>(96)</sup>

### **Diagnosis:**

VF paresis can be diagnosed by patient's medical history.<sup>(98)</sup>

Voice assessment is necessary to plan and estimate the success of a possible speech therapy<sup>(99)</sup>. Stroboscopic larynx examination to assess tension and fine mobility of the vocal folds during vocalization.<sup>(100,101)</sup>

## **2.11 Presbyphonia**

Presbyphonia is the physiological hoarseness of old age,which is found in around 25% of those over 65 years of age. Males and females are equally effected.<sup>(102)</sup>

Age related vocal fold's alterations in the deposition of extra cellular matrix (ECM) have been reported in humans, including excessive accumulation of collagen, reduced elastin, and decrease hyaluronic acid (HA).<sup>(103,104)</sup>

The elderly people undergo mechanical, anatomical and functional changes alteration of the pulmonary bellows, systemic changes like hormonal dysregulation , and laryngeal changes , that resulting in hoarseness, which is difficult to treat. <sup>(105)</sup>

## **2.12 Psychogenic dysphonia**

The somatization of emotional disorders through the voice, referred to psychogenic functional dysphonia <sup>(106, 107)</sup>

The psychogenic dysphonia is considered as a functional voice disorder, as there are no structural laryngeal abnormality or neurological alterations directly related to the vocal symptoms <sup>(108)</sup>, psychogenic dysphonia has been noted to be more common in women. <sup>(109)</sup>

In psychogenic dysphonia, psychoemotional and psychosocial disorders are usually identified, including anxiety, distress, depression, conversion reaction, personality disorders and interpersonal conflict in the family or professional environment. <sup>(107)</sup>

The predominant age group is between 30 and 50 years of age , psychogenic dysphonia is rare in children. <sup>(110)</sup>

The intermittent nature of psychogenic dysphonia is the most prevalent form of evolution, in which periods of normal voice alternate with periods of aphonia or dysphonia. These fluctuations in vocal emissions are generally observed in the first minute of the medical consultation, leading the physician to the diagnosis <sup>(108)</sup>

Video Laryngeoscopic examination in psychogenic dysphonia doesn't identify organic laryngeal lesions. Thus, the video laryngeoscopic assessment is not always capable of differentiating psychogenic dysphonia from other functional dysphonias. <sup>(111,112)</sup> Behavioral psychotherapy is helpful <sup>(113,114)</sup>, whereas voice therapy is completely ineffective. <sup>(115)</sup>

## **2.13 Internal disease with occasional laryngeal manifestation :**

Tuberculosis <sup>(116)</sup>, Rheumatoid disease such as rheumatoid arthritis <sup>(117)</sup>, systemic lobus erythematosus. <sup>(118)</sup> Wegener disease <sup>(119)</sup>, and laryngeal sarcoidosis <sup>(120)</sup>, Amayloidosis, In all these diseases multidisciplinary management is mandatory. <sup>(121,122)</sup>

# **Chapter Three**

## **Patients and Method**

## **Patients and Method:**

An observational cross-sectional study. At the ENT department, in Al-Diwaniyah teaching hospital, evaluated each patient complaining of hoarseness and 125 cases were collected from 2-4-2018 to 2-7-2018 . Full history and examination were done for each patient in all age groups .

Evaluation include :

Regarding the history, data of:

**1-age, name, gender, occupation, and address .**

**2-Duration;** acute (less than 3 weeks )or chronic (more than 3 weeks)

**3- Constant or intermittent,** other associated symptoms such as:

Sore throat and irritation, sensation of foreign body, frequent throat clearance, neck swelling and pain, fever, cough and dyspnea, painful vocalization heartburn, vomiting, and weight loss

**4-Habbits and behavior:**

Smoking:

Smoker or not, duration of smoking, No. of cigarettes per day.

Alcohol: Amount of drinks per week

Habit of shouting, and voice abuse.

Eating habit (fat meal, and spicy food)

**5-Past medical history**

Hypothyroidism

Psychological problem, GERD, Neurological condition such as Parkinson disease, or stroke, Pulmonary condition such as TB

Radiation exposure, diabetes, and Allergy.



## **6-Past surgical history**

History of intubation in general anesthesia, thyroid surgery, other neck-heart pulmonary surgery.

## **7-Family history of laryngeal cancer**

### **Physical examination :**

General examination: Pallor, body built (weight loss), Neck mass, other signs and symptoms of disease such as fever, sign of hypothyroidism and neurological disease

Full ENT examination:

Nasal examination:

Sign of allergy such as congestion and post nasal drip.

Patient presented with acute hoarseness(less than 3 weeks) examine by indirect laryngoscopy, and if it was difficult due to strong gag reflex or difficult anatomy then the patient will be examined by direct laryngoscopy, if there is A a sign of acute laryngitis and vocal strain, no feature of serious pathology, no further investigation needed.

Patient presented with chronic hoarseness (more than 3weeks) was examined by indirect and direct laryngoscopy to visualize the lesion.

Investigations:

Some patients may require investigations because they have features suggesting other diseases, such as: TB, Goiter, and other systemic disease associated with hoarseness, these investigations include:

Fasting blood sugar, thyroid function test, Rheumatoid factor, and Sputum AFB, CBP, ESR, Lateral neck X-ray, and chest X-ray.

CT and MRI are required for patients that have features of malignant disease, such as mass discovered during examination by laryngoscopy, then send for taking biopsy.

About 91 patients were examined by indirect laryngoscopy, and then by direct laryngoscopy respectively, 5 of them didn't complete the examination due to un cooperation. 20 patients were examined by indirect laryngoscopy only, 9 patients were examined by direct laryngoscopy only. others patient don't require laryngoscopic examination.

SPSS (Statistical packages for social sciences ) version 20, was used for data analysis, frequency and percentage was used to represent the categorical data, Chi square test was used to confirm significance. P- value  $<0.05$  was considered statistically significant .

### **Ethical consideration during study :**

In all participants, Verbal consent was taken, and they were informed about the use of questionnaire paper, and they also were informed about their right to refuse. Finally participants were informed that questionnaire interview will be included in the study

### **Inclusion Criteria:**

Any patient presented with hoarseness was included in our study.

### **Exclusion Criteria:**

- 1-Any patient with tracheostomy, other than laryngeal disease
- 2-Any patient that failed to achieve complete evaluation.

# **Chapter Four**

## **Results**

#### 4.1 Distribution of patients according to age and gender

The mean age of patients enrolled in the present study was 42.22 years and the study included 71 (56.8%) male patients and 54 (43.2%) female patients. The mean age of male and female patients was 41.98 years and 42.54 years, respectively without significant difference in mean age between them ( $P=0.838$ ), as shown in figure 4-1.

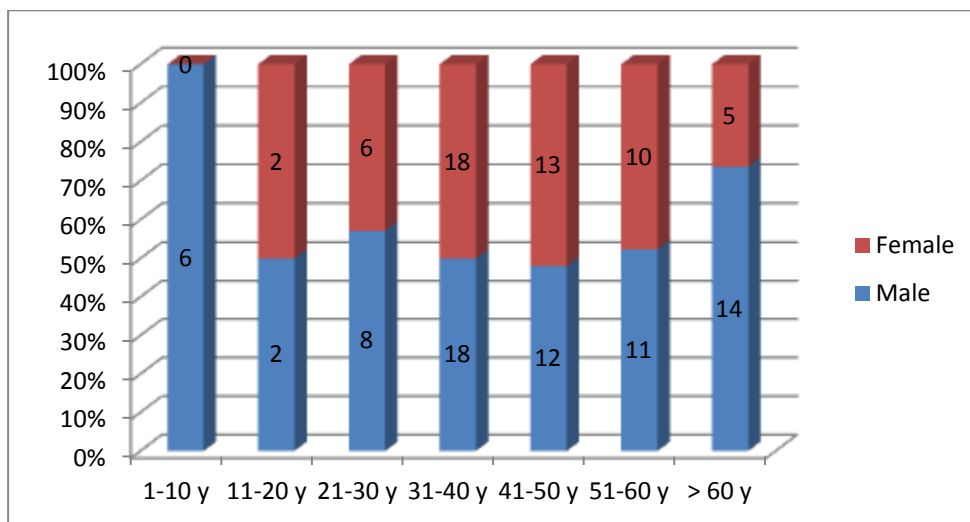
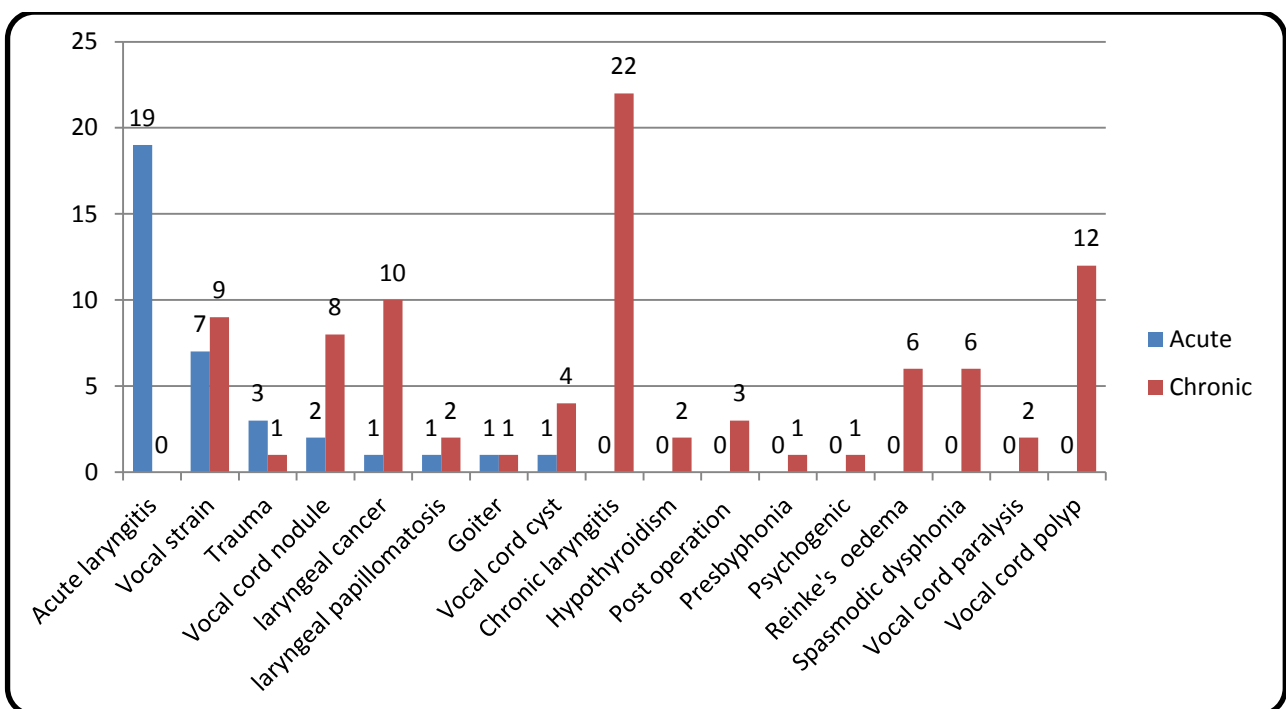


Figure 4-1: Distribution of cases according to age and gender

#### 4.2 Causes and duration of hoarseness of voice

According to the duration of illness, patients were classified into those with acute presentation accounting for 39 out of 125 (31.2%) and those with chronic presentation accounting for 86 (68.8%). Acute laryngitis was seen in 19 (15.2%) patients the presentation of whom was acute in all (100%). Vocal strain was seen in 16 (12.8%) the presentation of whom was acute in 7 (43.8%) and chronic in 9 (56.3%). Trauma (Exogenous blunt trauma) was seen in 4 (3.2%) the presentation of whom was acute in 3 (75.0%) and chronic in 1 (25.0%). Vocal cord nodule was seen in 10 (8.0%) the presentation of whom was acute in 2 (20.0%) and chronic in

8 (80.0%). Laryngeal cancer was seen in 11 (8.8%) the presentation of whom was acute in 1 (9.1%) and chronic in 10 (90.9%). Laryngeal papillomatosis was seen in 3 (2.4%) the presentation of whom was acute in 1 (33.3%) and chronic in 2 (66.7%). Goiter was seen in 2 (1.6%) the presentation of whom was acute in 1 (50.0%) and chronic 1 (50.0%). Vocal cord cyst was seen in 5 (4.0%) the presentation of whom was acute in 1 (20.0%) and chronic in 4 (80.0%). Chronic laryngitis was seen in 22 (17.6%) the presentation of whom was chronic in all (100.0%). Hypothyroidism was seen in 2 (1.6%) the presentation of whom was chronic in all (100.0%). Post-operative was seen in 3 (2.4%) the presentation of whom was chronic in all (100.0%). Presbyphonia was seen in 1 (0.8%) 1 the presentation of whom was chronic. Psychogenic was seen in 1 (0.8%) the presentation of whom was chronic. Reinke's oedema was seen in 6 (4.8%) the presentation of whom was chronic in all (100.0%). Spasmodic dysphonia was seen in 6 (4.8) the presentation of whom was chronic in all (100.0%). Vocal cord paralysis was seen in 2 (1.6%) the presentation of whom was chronic in all (100.0%). Vocal cord polyp was seen in 12 (9.6%) the presentation of whom was chronic in all (100.0%), as shown in figure 4-2.



**Figure 4-2: Causes and duration of hoarseness of voice**

### 4.3 Other associated clinical features:

The main presenting clinical features in patients enrolled in the present study, in addition to hoarseness of voice, were Sore throat, frequent throat clearance, foreign body sensation, cough, dyspnoea, painful vocalization, heart burn, fever, weight loss, goiter and vomiting, as shown in figure 4-3. The frequencies of these features were as following: 68.8 %, 55.2%, 41.6%, 40.0%, 35.2%, 32.0%, 28.8%, 22.4%, 12.0%, 9.6% and 4.0%, respectively.

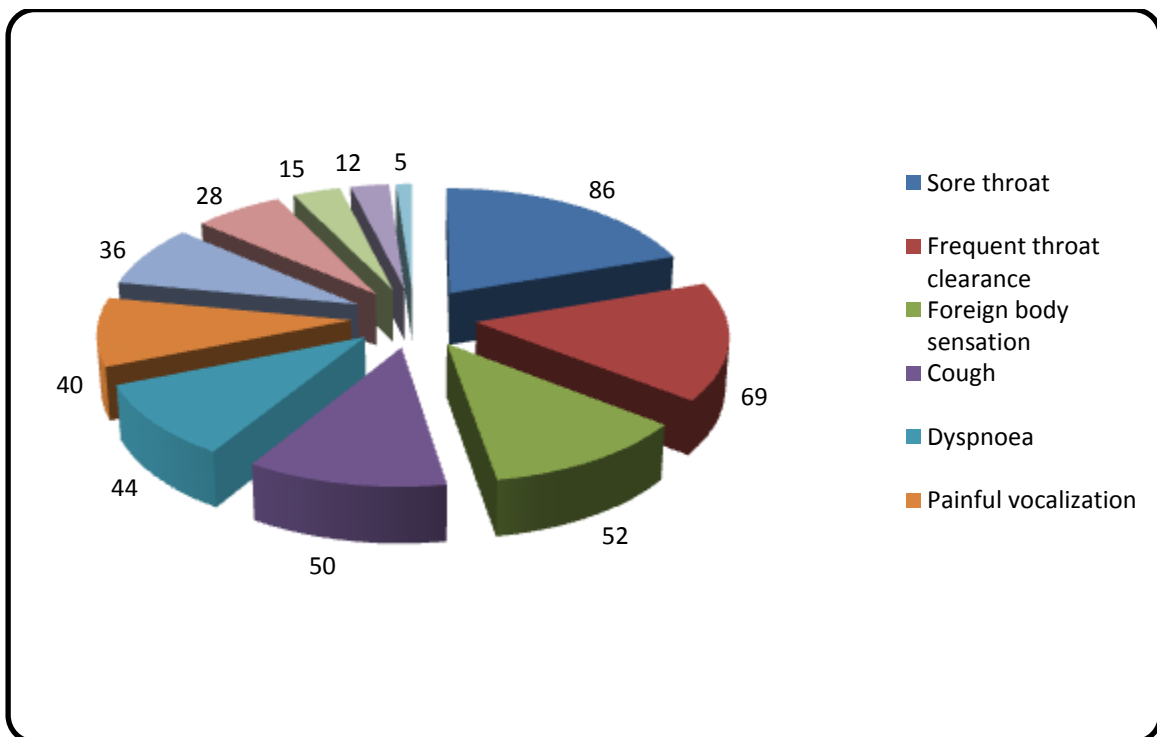


Figure 4-3: Main presenting clinical features

### 4.4 The association between gender of patients and causes of hoarseness of voice

Out of all causes, only laryngeal cancer showed significant association with gender, as it occurred more frequently in male patients ( $P=0.038$ ), as shown in

table 4-4). Other causes had no significant association with gender of patients ( $P>0.05$ ), as shown in table 4-1.

**Table 4-1: Causes according to gender**

Causes	Male <i>n</i> = 71	Female <i>n</i> = 54	$\chi^2$	<i>P</i>
Acute laryngitis	11 (15.5)	8 (14.8)	0.011	0.917
Chronic laryngitis	10 (14.1)	12 (22.2)	1.401	0.237
Hypothyroidism	1 (1.4)	1 (1.9)	0.000†	1.000
laryngeal cancer	10 (14.1)	1 (1.9)	4.296†	0.038
laryngeal papillomatosis	3 (4.2)	0 (0.0)	0.882†	0.348
Goiter	0 (0.0)	2 (3.7)	0.838†	0.360
Post operation (iatrogenic)	1 (1.4)	2 (3.7)	0.058†	0.810
Presbyphonia	1 (1.4)	0 (0.0)	0.000†	1.000
Psychogenic	1 (1.4)	0 (0.0)	0.000†	1.000
Reinke's oedema	3 (4.2)	3 (5.6)	0.000†	1.000
Spasmodic dysphonia	3 (4.2)	3 (5.6)	0.000†	1.000
Truama	4 (5.6)	0 (0.0)	1.587†	0.208
Vocal cord cyst	3 (4.2)	2 (3.7)	0.000†	1.000
Vocal cord nodule	4 (5.6)	6 (11.1)	0.617†	0.432
Vocal cord paralysis	1 (1.4)	1 (1.9)	0.000†	1.000
Vocal cord polyp	9 (12.7)	3 (5.6)		0.181
Vocal strain	6 (8.5)	10 (18.5)		0.095

†Yates's correction for continuity

#### **4.5 The association between smoking and causes of hoarseness of voice**

Laryngeal papillomatosis was significantly more frequent among non-smokers ( $P=0.03$ ), post-operative hoarseness was also more frequently seen in non-smokers ( $P=0.030$ ). Vocal cord nodules were significantly more frequent in non-smokers ( $P=0.038$ ), whereas, vocal cord polyps were significantly more frequently seen in smokers ( $P=0.037$ ). Laryngeal cancer was significantly more frequent in smokers than non-smokers ( $P<0.001$ ) as shown in table 4-2.

**Table 4-2: Causes in association with smoking**

Causes	Smokers <i>n</i> = 60	Non-smokers <i>n</i> = 65	$\chi^2$	<i>P</i>
Acute laryngitis	7 (11.7)	12 (18.5)	0.823	0.364
Chronic laryngitis	10 (16.7)	12 (18.5)	0.010	0.922
Hypothyroidism	1 (1.7)	1 (1.5)	0.000	1.000†
laryngeal cancer	11 (18.3)	0 (0.0)	13.933	<0.001
laryngeal papillomatosis	0 (0.0)	3 (4.6)	1.093	0.030†
Goiter	1 (1.7)	1 (1.5)	0.000	1.000†
Post operation (iatrogenic)	0 (0.0)	3 (4.6)	1.093	0.030†
Presbyphonia	1 (1.7)	0 (0.0)	0.005	0.942†
Psychogenic	0 (0.0)	1 (1.5)	0.000	1.000†
Reinke's oedema	5 (8.3)	1(1.5)	3.165	0.076†
Spasmodic dysphonia	4 (6.7)	2 (3.1)	0.361	0.548†
Trauma	4 (6.7)	0 (0.0)	2.807	0.094†
Vocal cord cyst	3 (5.0)	2 (3.1)	0.027	0.869†
Vocal cord nodule	1 (1.7)	9 (13.8)	4.309	0.038†
Vocal cord paralysis	0 (0.0)	2 (3.1)	0.374	0.541†
Vocal cord polyp	9 (15.0)	3 (4.6)	4.366	0.037
Vocal strain	3 (5.0)	13 (20.0)	5.640	0.018

†Yates's correction for continuity

#### **4.6The association between residency and causes of hoarseness of voice**

Vocal cord cyst was significantly limited to rural areas when compared with urban areas, 5 (10.9%) versus 0 (0.0%) ( $P=0.012$ ), as shown in table 4-4. None of the rest of causes showed significant association with residence ( $P>0.05$ ), as shown in table 4-3.



**Table 4-3: Causes according to residency**

Causes	Urban n = 79	Rural n = 46	$\chi^2$	P
Acute laryngitis	12 (15.2)	7 (15.2)	0.000	0.997
Chronic laryngitis	16 (20.3)	6 (13.0)	1.042	0.307
Hypothyroidism	2 (2.5)	0 (0.0)	0.122	0.727†
laryngeal cancer	6 (7.6)	5 (10.9)	0.088	0.767†
laryngeal papillomatosis	0 (0.0)	3 (6.5)	2.862	0.091†
Goiter	2 (2.5)	0 (0.0)	0.122	0.727†
Post operation (iatrogenic)	2 (2.5)	1 (2.2)	0.000	1.000†
Presbyphonia	1 (1.3)	0 (0.0)	0.000	1.000†
Psychogenic	1 (1.3)	0 (0.0)	0.000	1.000†
Reinke's oedema	3 (3.8)	3 (6.5)	0.064	0.800†
Spasmodic dysphonia	2 (2.5)	4 (8.7)	1.257	0.292†
Trauma	2 (2.5)	2 (4.3)	0.001	0.976†
Vocal cord cyst	0 (0.0)	5 (10.9)	6.338	0.012†
Vocal cord nodule	6 (7.6)	4 (8.7)	0.000	1.000†
Vocal cord paralysis	1 (1.3)	1 (2.2)	0.000	1.000†
Vocal cord polyp	11 (13.9)	1 (2.2)	3.370	0.066†
Vocal strain	12 (15.2)	4 (8.7)	1.099	0.295†

†Yates's correction for continuity

#### 4.7 Association between voice abuse and causes of hoarseness of voice

Vocal strain was significantly associated with voice abuse ( $P < 0.001$ ), while no other cause showed significant association with voice abuse, as shown in table 4-4.

**Table 4-4: Causes according to voice abuse**

Causes	Voice abuse <i>n</i> = 70	No voice abuse <i>n</i> = 55	$\chi^2$	<i>P</i>
Acute laryngitis	9 (12.9)	10 ( 18.2)	0.677	0.410
Chronic laryngitis	11 (15.7)	11 (20.0)	0.390	0.532
Hypothyroidism	1 (1.4)	1 (1.8)	0.000	1.000†
laryngeal cancer	2 (2.9)	9 (16.4)	5.419	0.020†
laryngeal papillomatosis	1 (1.4)	2 (3.6)	0.045	0.832†
Goiter	0 (0.0)	2 (3.6)	0.793	0.373†
Post operation (iatrogenic)	1 (1.4)	2 (3.6)	0.045	0.832†
Presbyphonia	0 (0.0)	1 (1.8)	0.015	0.903†
Psychogenic	1 (1.4)	0 (0.0)	0.000	1.000†
Reinke's oedema	5 (7.1)	1 (1.8)	0.923	0.337†
Spasmodic dysphonia	4 (5.7)	2 (3.6)	0.014	0.906†
Trauma	2 (2.9)	2 (3.6)	0.000	1.000†
Vocal cord cyst	1 (1.4)	4 (7.3)	1.429	0.232†
Vocal cord nodule	7 (10.0)	3 (5.5)	0.357	0.550†
Vocal cord paralysis	0 (0.0)	2 (3.6)	0.793	0.373†
Vocal cord polyp	9 (12.9)	3 (5.5)	1.945	0.163
Vocal strain	16 (22.9)	0 (0.0)	14.417	<0.001

†Yates's correction for continuity

#### 4.8 Intermittent versus constant complaint

Hoarseness was significantly constant feature in patients with acute laryngitis ( $P = 0.016$ ), whereas, it was significantly intermittent in patients with chronic laryngitis ( $P = 0.001$ ), as shown in table 4-5.

**Table 4-5: Causes by according to whether symptoms are intermittent or constant**

Causes	Intermittent	Constant	$\chi^2$	<i>P</i>
Acute laryngitis	3 (5.9)	16 (21.6)	5.803	0.016
Chronic laryngitis	16 (31.4)	6 (8.1)	11.268	0.001
Hypothyroidism	1 (2.0)	1 (1.4)	0.000	1.000†
laryngeal cancer	4 (7.8)	7 (9.5)	0.000	1.000†
laryngeal papillomatosis	1 (2.0)	2 (2.7)	0.000	1.000†
Goiter	2 (3.9)	0 (0.0)	0.984	0.321†
Post operation (iatrogenic)	1 (2.0)	2 (2.7)	0.000	1.000†
Presbyphonia	0 (0.0)	1 (1.4)	0.000	1.000†
Psychogenic	0 (0.0)	1 (1.4)	0.000	1.000†
Reinke's oedema	1 (2.0)	5 (6.8)	0.651	0.420†
Spasmodic dysphonia	3 (5.9)	3 (4.1)	0.002	0.965†
Trauma	1 (2.0)	3 (4.1)	0.019	0.891†
Vocal cord cyst	4 (7.8)	1 (1.4)	1.839	0.175†
Vocal cord nodule	4 (7.8)	6 (8.1)	0.000	1.000†
Vocal cord paralysis	0 (0.0)	2 (2.7)	0.210	0.647†
Vocal cord polyp	6 (11.8)	6 (8.1)	0.139	0.709†
Vocal strain	4 (7.8)	12 (16.2)	1.896	0.168

†Yates's correction for continuity

#### **4.9 Association between causes of hoarseness of voice and age and occupation of the patients**

These associations were no amenable for statistical analysis because of the huge number of cells involved in the tables of associations and that chi-square was not valid and difficult to be corrected. However, we were able to find that laryngeal cancer was mainly seen in adult population and that inflammatory and reactive conditions were mainly seen in young adult population. In addition, we found that laryngeal papillomatosis was mainly seen in children under 10 years of age. No occupation showed aggregation of certain cause than others, as shown in Figure 4-4 and table 4-6.

**Table 4-6: Causes by age**

Causes	1-10 y n = 6 n (%)	11-20 y n = 4 n (%)	21-30 y n = 14 n (%)	31-40 y n = 36 n (%)	41-50 y n = 25 n (%)	51-60 y n = 21 n (%)	> 60 y n = 19 n (%)
Acute laryngitis	1 (16.7)	0 (0.0)	5 (35.7)	6 (16.7)	1 (4.0)	4 (19.0)	2 (10.5)
Chronic laryngitis	2 (33.3)	2 (50.0)	0 (0.0)	6 (16.7)	6 (24.0)	1 (4.8)	5 (26.3)
Hypothyroidism	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.8)	1 (4.0)	0 (0.0)	0 (0.0)
laryngeal cancer	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.0)	5 (23.8)	5 (26.3)
laryngeal papillomatosis	2 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.8)	0 (0.0)
Goiter	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (4.0)	1 (4.8)	0 (0.0)
Post operation (iatrogenic)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.8)	1 (4.0)	0 (0.0)	1 (5.3)
Presbyphonia	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.3)
Psychogenic	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Reinke's oedema	0 (0.0)	0 (0.0)	1 (7.1)	3 (8.3)	1 (4.0)	0 (0.0)	1 (5.3)
Spasmodic dysphonia	0 (0.0)	0 (0.0)	1 (7.1)	0 (0.0)	2 (8.0)	2 (9.5)	1 (5.3)
Trauma	0 (0.0)	0 (0.0)	1 (7.1)	2 (5.6)	1 (4.0)	0 (0.0)	0 (0.0)
Vocal cord cyst	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	1 (4.0)	0 (0.0)	3 (15.8)
Vocal cord nodule	1 (16.7)	0 (0.0)	2 (14.3)	6 (16.7)	0 (0.0)	1 (4.8)	0 (0.0)
Vocal cord paralysis	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (9.5)	0 (0.0)
Vocal cord polyp	0 (0.0)	0 (0.0)	1 (7.1)	3 (8.3)	5 (20.0)	3 (14.3)	0 (0.0)
Vocal strain	0 (0.0)	0 (0.0)	3 (21.4)	8 (22.2)	4 (16.0)	1 (4.8)	0 (0.0)

**4-4 Numbers of patients presented according to occupation**

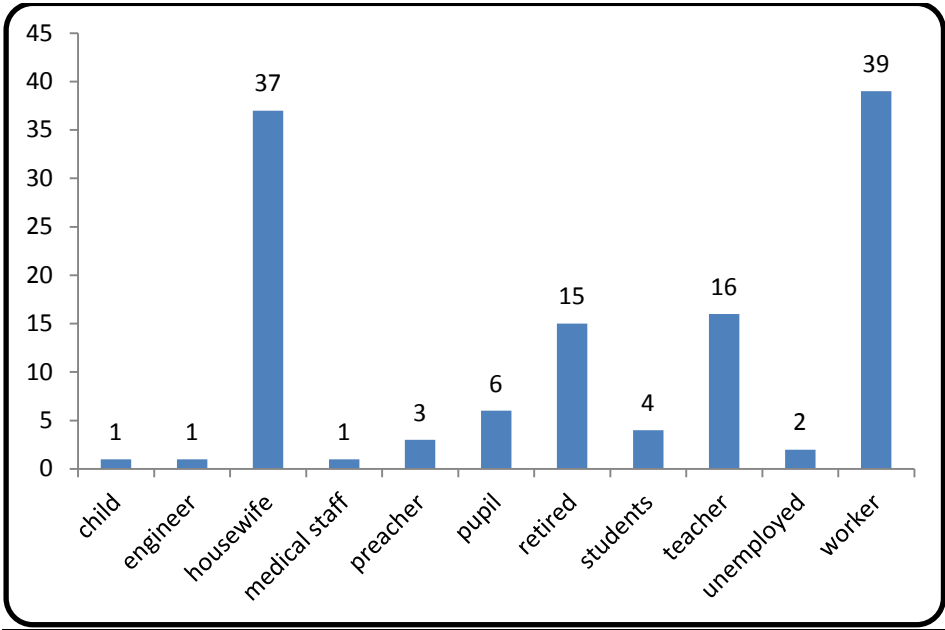


Figure 4-4: Number of patients presented according to occupation

# **Chapter Five**

## **Discussion**

## 5.1 Overview of the causes of hoarseness of voice

Possible causes of hoarseness are numerous and stem from many sources: anatomic, functional, neurologic, infectious, environmental, and neoplastic. Many common causes of hoarseness such as, voice abuse or viral laryngitis, can be benign and self-limited, but other causes such as, laryngeal cancer, can be life-threatening. These factors make the evaluation and treatment of a hoarse patient challenging and, at times, downright daunting (Kim and Rasgon, 2010). The present study came up with a long list of causes that share in common a single form of presentation which necessitate the need for careful history taking, meticulous physical examination and properly selected investigations in order to reach a specific diagnosis.

The current study showed that hoarseness of voice in patients seeking medical advice was most frequently due to chronic laryngitis (17.6%) followed by acute laryngitis (15.2%) then vocal strain (12.8%) then vocal cord nodule (8%), while the rest of causes included in the long list presented in the chapter of results accounted for less frequent proportions. These findings are in accordance with most published articles, hoarseness can be caused by acute (42.1%) and chronic laryngitis (9.7%) (Reiter *et al.*, 2015). The most common cause of hoarseness is acute laryngitis from short-term vocal abuse or an upper respiratory tract infection (Dworkin, 2008; Trottier *et al.*, 2013). In a study done in India, chronic laryngitis, whether specific or not, accounted for the majority of cases (approximately 40%) to be followed by cases of acute laryngitis (approximately 24%) and these findings are slightly higher than that of the present study.

## 5.2 Hoarseness of voice and age of patients

The present study showed that hoarseness of voice is a symptom that happens to patients with a wide range of age at time of presentation from 4 up to 80 years; However, it was more frequently seen in adults than in children. A study comprising of 110 cases of hoarseness was carried out in the department of otolaryngology—in an Indian city from Jan. 1998 to Sept. 1999, the Age of patients ranged between 6 to 71 years (Baitha *et al.*, 2002). In addition, (Baitha *et al.*, 2002) found that most cases were seen in adult population. In our study, it was observed that acute and chronic laryngitis can happen at any age but mostly seen in adults whereas, laryngeal cancer was mainly seen in elderly patients. So any elderly patient with hoarseness of voice should receive special attention because of the possibility of laryngeal carcinoma at that age. The highest incidence of laryngeal cancer occurs between the fifth and seventh decade of life (Markou *et al.*, 2013) and the mean age at time of diagnosis is 60.48 years (Fasunla *et al.*, 2016). As far as pathogenesis is concerned, several predisposing factors have been reported, including smoking and alcohol consumption which are the most important ones. Other possible risk factors are exposure to carcinogens in the work environment, nutrition, viral infections with HPV and EBV, radiation, gastroesophageal reflux disease and heredity. The progress of molecular biology in the field of the analysis and decoding of DNA proved that a number of genes, called oncogenes, are involved in the mechanism of carcinogenesis in the larynx (Wünsch Filho, 2004). Carcinoma larynx is rare under the age of 30 years and is common in 5th and 6th decade of life (Soni and Chouksey, 2017). Laryngeal papillomatosis was mainly seen in children less than 10 years of age and other causes were seen most frequently in adult population. Recurrent respiratory papillomatosis is of bimodal age and typical mean age at time of diagnosis can be 5 years at one extreme and 30 years on the other extreme (San Giorgi *et al.*, 2016); however, sufficient data in published literatures suggests a juvenile predominance, in accordance with our findings (Eftekhaar *et al.*, 2017). Recurrent respiratory



papillomatosis (RRP) is a rare disease caused by low-risk human papilloma virus (HPV) types 6 and 11; it is characterized by recurrent exophytic papillomas of the epithelial mucosa in the respiratory tract. Based on the age of patients, RRP is characterized as juvenile onset or adult onset. Patients presenting with this disease before 12 years of age are diagnosed with juvenile onset recurrent respiratory papillomatosis (JO-RRP), while patients presenting after 12 years of age are diagnosed with adult-onset recurrent respiratory papillomatosis (AO-RRP) (Ivancic *et al.*, 2018).

In the present study, there was a case of Presbyphonia seen in an elderly individual. Presbyphonia, the physiological hoarseness of old age, is found in around 25% of those over 65 years of age. The frequency is about the same in men and women. The vocal cord musculature atrophies in the course of the physiological aging process, giving rise to a more oval shape of the vocal cord fissure during phonation. Furthermore, the mucus-producing cells of the vocal cord also atrophy with age, so the surface film increases in viscosity, negatively influencing the sound of the voice. The leading symptom is a weak, less intense voice produced at the cost of pronounced strain. Presbyphonia must be distinguished from organic disorders of the vocal cords and from other illnesses, e.g., chronic obstructive pulmonary disease (Reiter *et al.*, 2015).

### **5.3 Hoarseness of voice and gender of the patient**

The present study showed no gender predilection for hoarseness of voice and that it can occur in both genders with nearly equal proportions. This result is in contrast to the finding of Soni and Chouksey (2017), who found that hoarseness of voice showed male predilection of 89% in comparison to female proportion of 11% only. This disagreement may probably be due to the fact that in the (Soni and Chouksey, 2017) study, the majority of patients were adults with an age range of 50 to 70 years, an age range at which smoking is a habit that is mostly practiced by male patients than female patients which may be the predominant predisposing factor for chronic and acute inflammatory conditions of the larynx.

Whereas, this study included much wider age range from 4 up to 80 years and hence the spectrum of causes is different from the above mentioned study. To the best of our knowledge, we failed to find a recent study, within the last five years, other than that of (Soni and Chouksey, 2017), with such finding of male predilection of hoarseness of voice.

Laryngeal cancer was significantly more common in male patients; however, there was no significant association between gender of patients and other cause of hoarseness of voice. Cancer of the larynx is an important entity of oncology. According to international data it accounts for 30% to 40% of all malignant head and neck tumors and 1% to 2.5% of all malignant neoplasms in the human body (Parkin *et al.*, 1999; Bray *et al.*, 2001). In terms of histopathology, 95% to 98% of cancer of the larynx is of squamous cell origin. The disease is much more common in the male gender (Markou *et al.*, 2013).

#### **5.4 The clinical features associated with hoarseness of voice**

In the present study, beside hoarseness of voice, several other presenting features were seen in patients like sore throat, dyspnea, cough and others that may help limiting the long list of differential diagnoses. In addition we found that chronic laryngitis was most commonly intermittent whereas acute one was most commonly continuous. The collection of signs and symptoms in a clinical setting for individual case is helpful in limiting the long list of differential diagnoses associated with hoarseness of voice. For instance, being an elderly male with weight loss and history of heavy smoking was associated with laryngeal cancer in the present study. The presence of sore throat, fever, cough besides being a child or young adult are suggestive of an inflammatory etiology. The presence of heart burn may direct the attention of the physician toward gastroesophageal reflux disease.

## **5.5 Smoking and hoarseness of voice**

In the present study, the following causes of hoarseness of voice were significantly more common in non-smokers than smokers; these are: Laryngeal papillomatosis, vocal cord nodules, vocal strain and post-operative hoarseness were more common among non-smokers. From etiologic point of view smoking has nothing to do with papillomatosis; however, smoking is among strongly blamed environmental hazards that may contribute in transformation of already human papilloma viral induce papillomatosis into malignant form of laryngeal cancer (Katsenos *et al.*, 2011; Venkatesan *et al.*, 2012; Fusconi *et al.*, 2014).

In the present study, we noticed strong positive association between smoking and the occurrence of vocal cord polyp. This finding is similar to the finding of (Effat and Milad, 2015) who stated that cigarette smoke has an injurious effect on vocal fold polyp epithelium and leads to increased hyaline degeneration in polyps and hence more rapid and higher rate of polyp development in smokers than non-smokers. Also our finding agrees with the finding of (Gnjatic *et al.*, 2009; Byeon, 2015) who stated that rate of dysphonia is greatly increased in chronic smokers and that smoking is an important risk factor for the development of vocal cord polyp.

## **5.6 Voice abuse and hoarseness of voice**

Vocal strain in the present study showed significant association with voice abuse; indeed, most voice pathology is the result of aberrant vocal use. Poor vocal technique, vocal hygiene (due to smoking, dehydration, and abusive behavior), and repeated laryngeal infection may result in deteriorating quality of the voice, vocal fatigue, and vocal strain (Carding, 2003).

## **5.7 Occupation and hoarseness of voice**

The current study showed no association of any cause with occupation. Not surprisingly dysphonia is particularly prevalent in people using their voice professionally (for example, teachers, lawyers, salespeople) and in performers (for example, actors and singers). The financial and psychosocial consequences of dysphonia for these professional groups are clear. The numbers of people affected are likely to increase as the modern world places increasing demands on the human voice via mobile telephones, voice recognition software, and interpersonal verbal communications. In advanced societies, the voice is essential for approximately one third of the labour force (Carding, 2003).

The main risk factors for non-organic dysphonia include excessive use of the voice, limited vocal recovery time, and stress. The effects of overuse of the voice are further compounded by other factors such as background noise, long speaking distance, poor room acoustics, and poor atmospheric humidity. These problems are typically reported not only by the actor with a demanding performance schedule but also by the teacher of a large class, the call centre operator working a nine hour shift, the aerobics instructor, and so on (Carding P, Wade, 2000).

## **Conclusion :**

1-The mean age of both males and females in this study was 42 years at presentation

2-The Peak incidence of hoarseness in age group 31-40 years

3-The the most common cause of hoarseness was chronic laryngitis, which predominantly affects the patients from the urban areas.

4- The males are affected more than females by laryngeal disease that may present with hoarseness of the voice.

5-laryngeal cancer more common in male, elderly, and smokers.

6-The most common occupational group present with hoarseness are workers and housewives.

## **Recommendation :**

1-Councling for vocal hygiene is important for patients who are at high risk of developing laryngeal disorder, mainly elderly, professional voice users.

2- Hoarseness in elderly patient, must pay attention, because high risk of malignancy.

3-Suggesting more studies for long period of time, and include more patients.

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# Appendix

## *Questionnaire*

### **Part 1:**

-No. of case

-Evaluation date ---- /-----/-----

-Name of patient -----

-Age -----

Gender -----

-Address Urban area

Rural area

-Occupation -----

### **-Part 2 : clinical symptoms**

\* Hoarseness

\*Duration <3 Wk>3 Wk

-Constant intermittent

-Do you feel throat pain or irritation? Yes  NO

-Do you feel sensation of foreign body? yes  NO

-Do you complain of frequent throat clearance? Yes  NO

-Do you feel painful vocalization? yes  NO

-Do you feel neck swelling? Yes  NO

-Do you have fever? Yes  NO

-Do you have dyspnea, cough? Yes  NO

-Do you have vomiting? Yes  NO

-Do you have heartburn? Yes  NO

-Do you have weight loss? Yes  NO

### **\*Part 3 : Habits and behavior**

-Smoking

How many cigarettes /day ? ( )

How long smoking? ( )

-Alcohol yes( ) NO ( ) - amount of drink/Wk? ( )cc

- shouting yes ( ) no ( ), -voice abuse yes( ) no( )

**\*Past medical history :**

-Diabetes mellitus

-History, type of trauma

-Hypothyroidism

-History of neurological condition

Goiter

- Parkinson disease, stroke

-Allergy

-Tuberculosis -Radiation

**\*Past Surgical history :**

-History of intubation in General anesthesia - History of thyroid surgery

-Family history of laryngeal Cancer

**\*Examination :**

1-General exam: Pallor ( ) Weight loss ( )

2-Oral finding 3-Nasal finding

4-Neck Exam

-Larynx -Endoscopic exam, - direct ,Indirect laryngeal exam

-Neck mass -Lymph node enlargement

**Investigations:** CT , MRI , TFT.

**Management :**

1-Voice rest 2-Antibiotic , Steroid , Anti-GERD

3-Surgery -Response to treatment

- كمية الشرب في الأسبوع ؟ ( )  
\* التأريخ المرضي السابق :

- داء السكري  
- إصابة سابقة في الرقبة ونوع الإصابة  
- خمول الغدة الدرقية  
- حالات عصبية سابقة ( الشلل الرعاش ، الجلطة الدماغية )

- فرط الحساسية  
- داء السل  
- تضخم الغدة الدرقية  
- التعرض للإشعاع

\*التأريخ الجراحي السابق :

- عمليات سابقة لإدخال الأنبوب في التخدير العام  
- عمليات الغدة الدرقية السابقة  
- حالات وراثية لحدوث سرطان الحنجرة في العائلة  
\* الفحص السريري :

1- الفحص العام شاحب ( ) انخفاض الوزن ( )

2- ملاحظات فحص الفم

3- ملاحظات فحص الأنف

- الفحص بناظور الحنجرة  
- الفحص الغير مباشر للحنجرة

4- فحص الرقبة

فحص الحنجرة - وجود ورم في الرقبة - تضخم الغدد اللمفاوية في الرقبة -

الفحوصات، الرنين المغناطيسي، وظائف الغدة الدرقية :

-العلاج :

1- راحة الصوت

2-المضادات الحيوية  
العمليات الجراحية  
-الاستجابة للعلاج  
الستيرويدات  
أدوية علاج إسترجاع المريء  
3-

بحة الصوت

الجزء الأول

- رقم الحالة

- تاريخ الفحص

- إسم المريض : -----  
-----  
- اسم المريض : -----

العمر : -----  
-----  
-الجنس : -----

- السكن : منطقة ريفية منطقة حضرية

-الجزء الثاني : الأعراض السريرية

- بحة الصوت

- المدة : > 3 أسابيع < 3 أسابيع ، - ثابتة متباينة

- |    |                          |     |                          |  |
|----|--------------------------|-----|--------------------------|--|
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تعاني من ألم أو تهيج في الحنجرة ؟ |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تشعر بوجود جسم غريب في الحنجرة ؟  |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تشتكي من تكرار تنظيف الحنجرة ؟    |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تشعر بألم أثناء الكلام ؟          |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تشعر بتضخم في الرقبة ؟            |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تشعر بارتفاع الحرارة ؟            |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تعاني من ضيق التنفس، السعال ؟     |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تعاني من التقيؤ ؟                 |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تشعر بحرقة المعدة ؟               |
| لا | <input type="checkbox"/> | نعم | <input type="checkbox"/> | - هل تعاني من انخفاض الوزن ؟           |

\*الجزء الثالث : العادات و السلوك :

- |    |     |                     |         |                              |
|----|-----|---------------------|---------|------------------------------|
| لا | نعم | لا                  | -الصراخ | -التدخين                     |
| لا | نعم | - سوء استخدام الصوت | ( )     | - عدد السجائر في اليوم ؟ ( ) |
|    |     |                     | ( )     | - مدة التدخين ؟ ( )          |

حسب هذه الدراسة وجد ان بحة الصوت اكثر شيوعا لدى العمال ( البائعين, الحلاقين والسائقين ) وربات البيوت.

### الاستنتاج

- 1- المعدل العمري للذكور والاناث في هذه الدراسة هم 42 سنة.
- 2- اعلى نسبة لحدوث بحة الصوت هو في الفئة العمرية 31-40 سنة
- 3- اكثر سبب لحدوث بحة الصوت هو التهاب الحنجرة المزمن والذي غالبا يؤثر على المرضى من المناطق الحضرية.
- 4- امراض الحنجرة التي تظهر على شكل بحة الصوت تؤثر غالبا على الذكور اكثر من الاناث.
- 5- سرطان الحنجرة اكثر شيوعا لدى الذكور، والمسنين والمدخنين.
- 6- اكثر فئة عاملة تتاثر ببحة الصوت هم العمال(السائقين، البائعين والحلاقين) وربات البيوت.

## الخلاصة

### الخلفية

بحة الصوت :

تعرف بحة الصوت على إنها تغير في نوعية الصوت، و الإحساس بخشونة أو قسوة الصوت . وهو عبارة عن عرض وليس تشخيص، لذلك يجب التحري عن السبب لكل حالة.

### الهدف من الدراسة

صممت هذه الدراسة لتحديد الأسباب المختلفة لبحة الصوت حسب العمر والجنس ومكان السكن والعمل و تأثير التدخين وإساءة استعمال الصوت على تطور أمراض الحنجرة .

### المرضى وطرق العمل

هذه الدراسة تعتبر دراسة مستقبلية.

تمت معاينة 125 مريض في استشارية الأنف والأذن والحنجرة في مستشفى الديوانية التعليمي للفترة ما بين 2/أبريل/2018 إلى 2/تموز/2018 .

### النتائج

حيث وجد ان نسبة الاناث 43.2% و نسبة الذكور 56.8 % وإن معدل العمر للذكور والاناث 42سنة.

نسبه المرضى الذين يعانون من الاعراض الحادة هم 19 من اصل 125 مريض (31.2 %). ونسبه الذين يعانون من الاعراض المزمنة هم 86 مريض من اصل 125 ( 68.6%)

أكثر سبب لحدوث بحة الصوت في الذكور هو التهاب الحنجرة الحاد(15.5%)، وأكثر أسباب بحة الصوت في الإناث هو التهاب الحنجرة المزمن (22.2%)

من اهم الاعراض بالاضافة لبحة الصوت هو الم في الحنجرة (68.8%)

اكثر سبب لبحة الصوت لدى المدخنين هو سرطان الحنجرة. بينما اكثر سبب لبحة الصوت لدى غير المدخنين هو شدة الصوت وذلك بسبب سوء استعمال الصوت.

إن التهاب الحنجرة الحاد هو أكثر سبب لحدوث بحة الصوت الحادة 19مريض (15.2 % ) ، و التهاب الحنجرة المزمن هو أكثر سبب لحدوث بحة الصوت المزمنة 22 مريض (17.6%) . أما أكثر سبب لحدوث بحة الصوت لدى المدخنين هو سرطان الحنجرة ، وشدة الصوت هي أكثر سبب لبحة الصوت لغير المدخنين.

التهاب الحنجرة المزمن والورم الحبيبي هما اكثر سببين لبحة الصوت لدى المرضى الذين تتراوح اعمارهم بين السنة وعشرة سنوات.



التهاب الحنجرة المزمن وسرطان الحنجرة هما اهم سببين لبحة الصوت للمرضى الذين تزيد اعمارهم عن 60 سنة.

## إقرار المشرف

إنني الاستاذ المساعد الدكتور قاسم ريسان دخيل المشرف على رسالة طالبة الدبلوم العالي (المعادل للماجستير) سرى عباس محمد رضا، وقد اطلعت على رسالة الطالبة المذكورة والتي انجزت تحت إشرافي، أقر و أؤيد صلاحيتها للمناقشة لاستيفائها كافة المتطلبات العلمية لدرجة الدبلوم العالي .

## التوقيع

المشرف : الاستاذ المساعد الدكتور قاسم ريسان دخيل

## مصادقة :

إنني رئيس فرع طب الاسرة والمجتمع في كلية الطب – جامعة القادسية، أصادق على إقرار المشرف على رسالة طالبة الدبلوم العالي (المعادل للماجستير) سرى عباس محمد رضا ، وأعتبر الرسالة صالحة للمناقشة من قبل اللجنة الممتحنة لهذا الغرض.

## التوقيع

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جامعة القادسية

كلية الطب

فرع طب المجتمع وطب الأسرة

## العوامل المسببة للبحّة في محافظة الديوانية

رسالة مقدمة إلى

كلية الطب/جامعة القادسية

كجزء من متطلبات نيل درجة الدبلوم العالي (المعادل للماجستير)

في اختصاص طب الأسرة

من قبل الطالبة

سرى عباس محمد رضا

بكالوريوس طب وجراحة عامة

بإشراف

أ.م.د قاسم ريسان دخيل

فرع الجراحة

2018م

1440 هجري

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