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Department of Otorhinolaryngology

Endoscopic Findings In Patients with nasal obstruction

A thesis submitted to the otorhinolaryngology department as a part of requirement for graduation

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بسم الله الرحمن الرحيم

صدق الله العظيم

Dedication...

This work is dedicated to my amazing parents who supported me through out this entire journey and paved the way for me to be able to reach my goals..

It’s also dedicated to all the medical personnel who provided us with knowledge, Guidance and who set an example for excellence and dedication for us to follow.

Acknowledgement...

Special thanks to Dr. Jaffar Alhassani for his guidance through out the making of this research paper and to all residents and medical staff at the ENT department in Al-Emamain alkhadhumain medical city.

Abstract

Background: Nasal obstruction affect a significant percentage of the patients who attend the outpatient Otorhinolaryngology department. It can be caused by a variety of pathologies affecting the nose or the Nasopharynx and have a spectrum of clinical presentations and findings on Endoscopic examination.

Aim: To correlate between the clinical presentation of patients with nasal obstruction and the findings on endoscopy.

Patients and Methods: A descriptive study of 45 patients who presented with nasal obstruction and were seen in the Otorhinolaryngology department in Al-Emamain Al-Khadhumain medical city over a period of 6 months (September 2018- February 2019).

Questionnaire was used to collect the patients data followed by Endoscopic examination of the nose and the post nasal space.

Results: the total number of the patients was 45, 60% of them were females and 40% of them were males, the age ranges from 18 to 72 years with highest age group being between 30-39 (28.9%) followed by 20-29 (24.4%), the mean was 31.9 years.

82.2% reported associated nasal discharge and 75.6% reported decrease in the smell, 55.6% reported itchy nose while 64.4% reported an associated headache.

Asthma was positive in 57% of the patients, otitis media in 20% and conjuctivitis by 8.9%.

The commonest endoscopic findings in order from highest to lowest were septal deviation (86,.7%), inferior turbinate hypertrophy (77.8%),middle turbinate hypertrophy(62.2%), Mucopurulent discharge (71%), nasal polyps (68.9%), abnormal uncinate process (20%) and post nasal mass (13.3%).

Conclusion: Nasal obstruction is one of the most common complaints to the Otorhinolaryngology departments, It's mostly reported by females between the age of 20-39 most of them were housewives. The most common associated symptoms were nasal discharge and hypo anosmia, about half of the patients were asthmatic also and few of them had eye and ear symptoms, family history is significant, one third of the patients are smokers the majority of whom are males with only 2 females.

The commonest endoscopic findings In order from highest to lowest were septal deviation, inferior turbinate hypertrophy, middle turbinate hypertrophy, mucopurulent discharge, nasal polyps, Abnormal uncinate process and post nasal mass.

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CHAPTER ONE

INTRODUCTION

The nose is divided into external nose and two internal nasal cavities.

EXTERNAL NOSE

is pyramidal in shape and is formed of :The upper third of the external nose is bony and consists of: The nasal bones which unite with each other in the midline. The nasal process of the frontal bone. The frontal process of the maxilla. The inferior two thirds are cartilaginous and consist of the upper lateral cartilage, lower lateral cartilages and alar cartilages. The skin over the cartilaginous part is closely adherent and contains multiple sebaceous glands. (1)

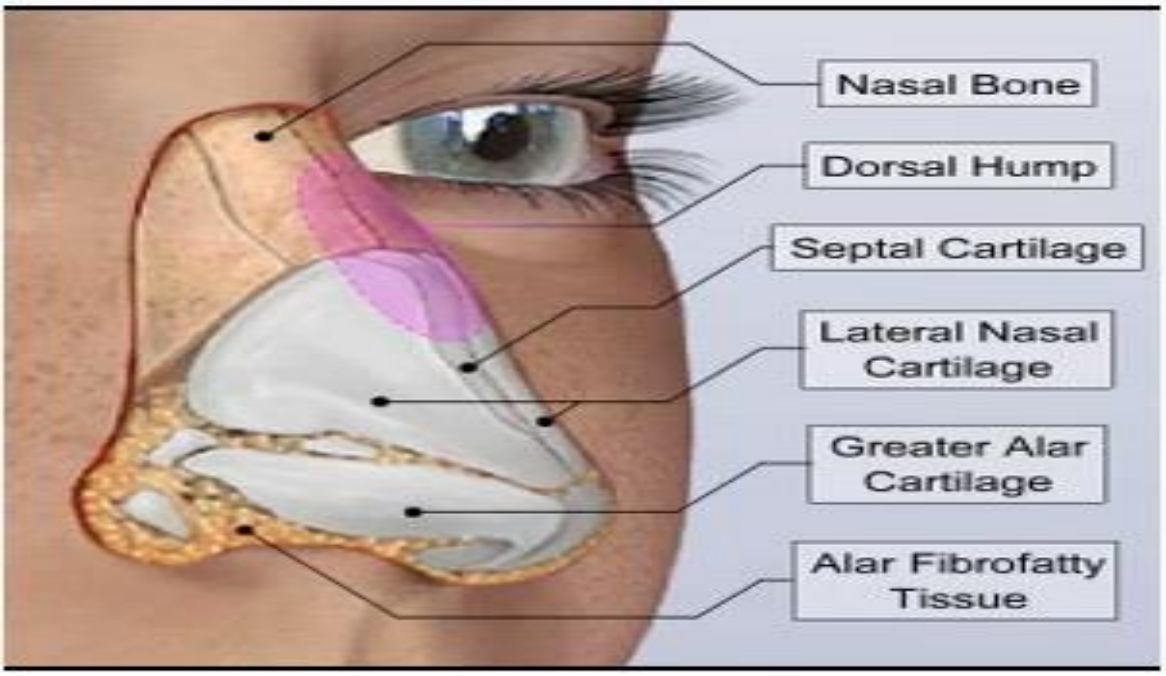


Figure (1)

INTERNAL NOSE

It is divided into right and left nasal cavities by nasal septum. Each nasal cavity communicates with the exterior through *naris* or nostril and with the nasopharynx through posterior nasal aperture or the *choana*. Each nasal cavity consists of a skin-lined portion the vestibule and a mucosa-lined portion, the nasal cavity proper. (2)

VESTIBULE OF NOSE

Anterior and inferior part of nasal cavity is called *vestibule*. It is lined by skin and contains sebaceous glands, hair follicles and the hair called *vibrissae*. Its upper limit on the lateral wall is marked by (nasal valve).

Nasal valve

It is bounded laterally by the lower border of upper lateral cartilage and fibrofatty tissue and anterior end of inferior turbinate, medially by the cartilaginous nasal septum, and caudally by the floor of pyriform aperture. The angle between the nasal septum and lower border of upper lateral cartilage is nearly 30°.

Nasal valve area

It is the cross-sectional area bounded by the structures forming the valve. It is the least cross sectional area of nose and regulates airflow and resistance on inspiration. (1)

NASAL CAVITY PROPER

Each nasal cavity has a ***lateral wall***, a ***medial wall***, a ***roof*** and a ***floor***.

LATERAL NASAL WALL

Three and occasionally four turbinates or conchae mark the lateral wall of nose. Conchae or turbinates are scroll like bony projections covered by mucous membrane. The spaces below the turbinates are called meatuses

Inferior turbinate

It is a separate bone and below it, into the inferior meatus, opens the nasolacrimal duct guarded at its terminal end by a mucosal valve called *Hasner's valve*

Middle turbinate

It is an ethmoturbinal—a part of ethmoid bone. It is attached to the lateral wall by a bony lamella called *ground or basal lamella*. Its attachment is not straight but in an S-shaped manner. In the anterior third, it lies in sagittal plane and is attached to lateral edge of cribriform plate. In the middle third, it lies in frontal planeand is attached to lamina papyracea while in its posterior third, it runs horizontally and forms roof of the middle meatus and is attached to lamina papyracea and medial wall of maxillary sinus.

Middle meatus

It shows several important structures which are important in endoscopic surgery of the sinuses *Uncinate process* is a hook-like structure running in from anterosuperior to posteroinferior direction. Its posterosuperior border is sharp and runs parallel to anterior borderof bulla ethmoidalis. It is a two-dimensional space of1–2 mm width. Posteroinferior end of uncinate process is attached to inferior turbinate dividing the membranous part of lower middle meatus into anterior and posterior fontanelle.The space limited medially by the uncinate process and frontal process of maxilla and sometimes lacrimal bone, and laterally by the lamina papyracea is called *infundibulum* .

Bulla ethmoidalis

It is an ethmoidal cell situated behind the uncinate process. Anterior surface of the bulla forms the posterior boundary of hiatus semilunaris. It may extend superiorly to the skull base and posteriorly to fuse with ground lamella.

The suprabullar and retrobullar recesses together form the *lateral sinus* (sinus lateralis of Grunwald). [1]

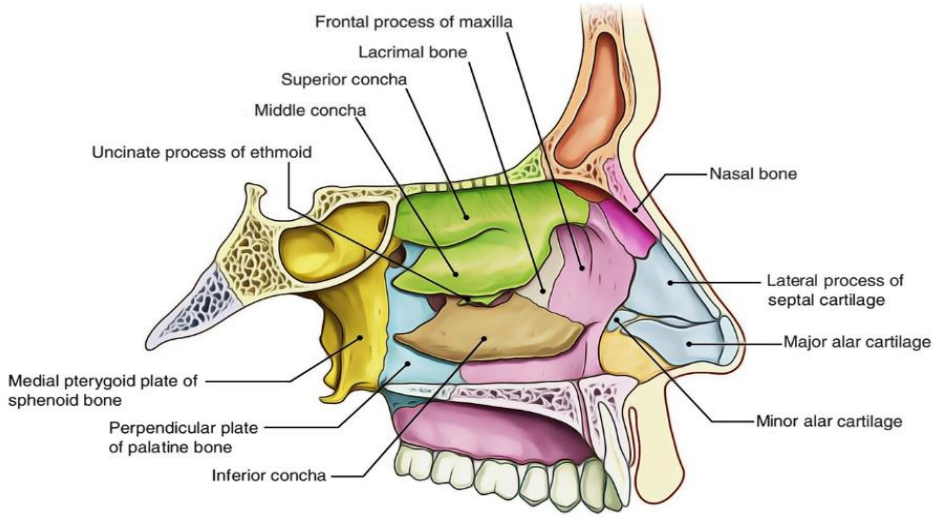


Figure (2)

Superior turbinate

It is also an ethmoturbinal and is situated posterior and superior to middle turbinate. It may also get pneumatized by one or more cells. It forms an important landmark to identify ostium of sphenoid sinus which lies medial to it.

Superior meatus

It is a space below the superior turbinate.Posterior ethmoid cells open into it. . Onodi cell is a posterior ethmoidal cell which may grow posteriorly by the side of sphenoid sinus or superior to it for as much distance as 1.5 cm from the anterior surface of sphenoid. Onodi cell is surgically important as the optic nerve may be related to its lateral wall.

Sphenoethmoidal recess

It is situated above the superior turbinate. Sphenoid sinus opens into it.

Supreme turbinate

It is sometimes present above the superior turbinate and has a narrow meatus beneath it.

The ostium of sphenoid sinus is situated in the sphenoethmoidal recess medial to the superior or supreme turbinate.
It can be located endoscopically about 1 cm above the upper margin of posterior choana close to the posterior border of the septum. (1)

MEDIAL WALL

Nasal septum forms the medial wall . (1)

ROOF

Anterior sloping part of the roof is formed by nasal bones, posterior sloping part is formed by the body of sphenoid bone and the middle horizontal part is formed by the cribriform plate of ethmoid through which the olfactory nerves enter the nasal cavity. (1)

FLOOR

It is formed by palatine process of the maxilla in its anterior three-fourths and horizontal part of the palatine bone in its posterior one-fourth. (1)

ANATOMY OF THE PARANASAL SINUSES

The paranasal sinuses are extensions of the nasal cavity as air-filled spaces lined with pseudostratified columnar ciliated epithelium continuous with that of the nasal cavity.

They are grouped as anterior (the frontal, anterior ethmoid and maxillary sinuses) and posterior (the posterior ethmoid and sphenoid sinuses). The anterior group drains into the middle meatus. - 74 - The posterior ethmoid and sphenoid sinuses drain into the superior meatus and sphenoethmoidal recess respectively. The drainage area of the anterior group of paranasal sinuses is called the osteomeatal complex.

Maxillary sinus

The maxillary sinus is pyramidal in shape and present in the body of the maxilla. It is related to the orbit superiorly, alveolus inferiorly, and pterygopalatine fossa posteriorly. Medially, it is related to the inferior and middle meati in the lateral nasal wall. Its ostium opens high up in its medial wall, to drain in the middle meatus. The second premolar and first molar teeth are closely related to the floor of the sinus.

Ethmoid sinus

The ethmoid sinus described as a labyrinth of air-filled cavities located in the superior part of the lateral nasal wall. It is separated into anterior and posterior by the basal lamella of the middle turbinate. Important adjacent structures include the orbit laterally and anterior cranial fossa superiorly.

Frontal sinus

The frontal sinus lies between the outer and inner tables of the frontal bone. It is not present at birth. Its boundaries are the orbit inferiorly, the anterior cranial fossa posteriorly, the forehead anteriorly and separated from the other frontal sinus medially by the septum. Its ostium locates at the medial part of its floor to drain in the middle meatus.

Sphenoid sinus

The sphenoid sinus is situated in the body of the sphenoid bone. It has a close lateral relationship to cavernous sinus, the internal carotid artery and the optic nerve. The pituitary fossa lies posterosuperiorly. [1]

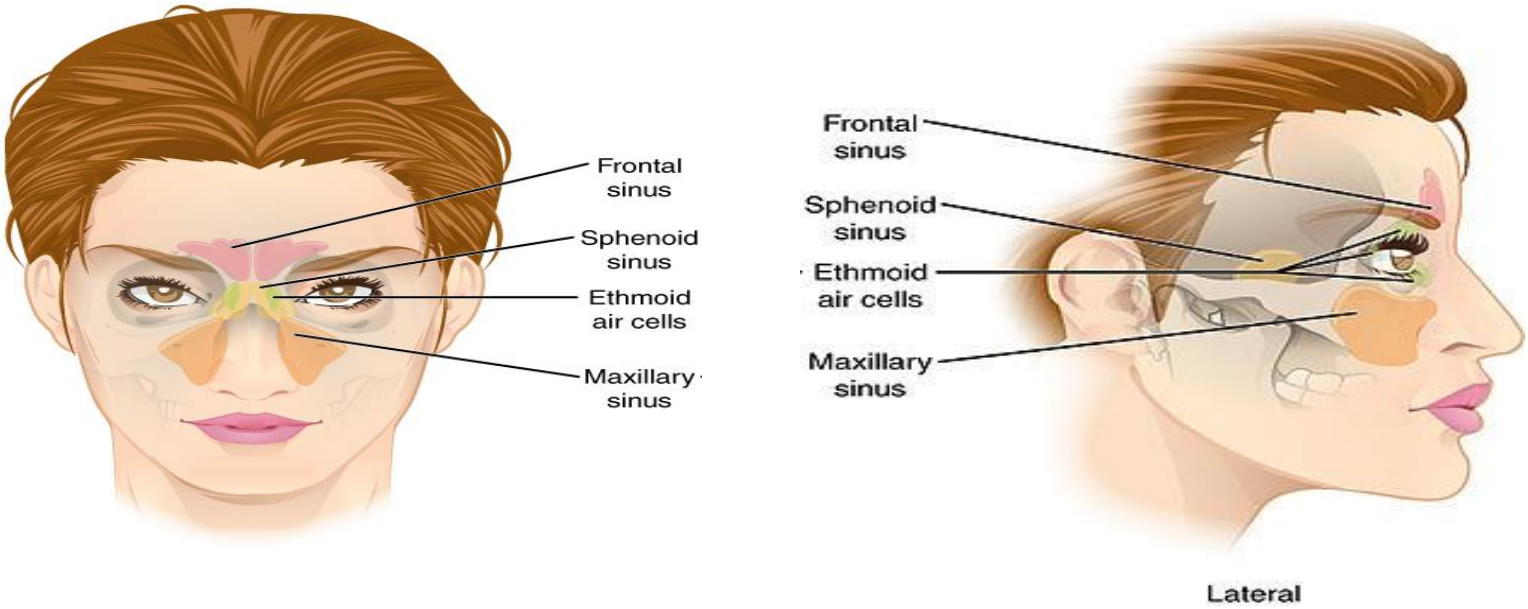


Figure (3)

PHYSIOLOGY OF THE NOSE AND THE SINUSES

1. Respiratory airway.
2. Air conditioning of the inspired air.
3. Olfaction.
4. Purification of the inspired air.
5. Resonance of voice.
6. Tears drainage [3]

NASAL OBSTRUCTION

Is a sensation of blockage within the nose or difficulty breathing out of one or both nostrils. (4)

CLASSIFICATION

- ❖ Physiological: Alternating or position dependent
- ❖ Bilateral or unilateral
- ❖ Partial or complete
- ❖ Continuous or intermittent
- ❖ Anatomical parts(Nose, Sinuses, Nasopharynx) [4]

Nasal obstruction characterized by insufficient airflow through the nose can be a subjective sensation or the result of objective pathology.

It is difficult to quantify by subjective complaints or clinical examinations alone, hence both clinicians and researchers depend both on concurrent subjective assessment and on objective measurement of the nasal airway.

Often a doctor's assessment of a perfectly patent nasal airway might differ with a patient's complaint of an obstructed nose.

Table (1)

UNILATERAL NASAL OBSTRUCTION	***BILATERAL NASAL OBSTRUCTION***
Structural: ▪ Deviated nasal septum ▪ inferior turbinate hypertrophy ▪ conch bullosa	Infection: ▪ Acute Rhinitis ▪ Chronic rhinosinusitis, Atrophic rhinitis
Infection: unilateral sinusitis	Allergy: Allergic rhinitis
Poly: Antrochoanal polyp	Non allergic non infective: vasomotor rhinitis
Foreign body	Adenoids hypertrophy
Neoplasm	Structural: Deviated nasal septum
Congenital: Chanel atresia	Trauma: Septal hematoma
Trauma	Ethmoidal polyposis
Granulomatous disease: Rhinoscleroma	Neoplasms
	Rhinitis medicamentosa

DIAGNOSIS

- ❖ Clinical examination
- ❖ Endoscopy
- ❖ Assessment of the nasal patency by:
    i. Subjective scoring systems

ii. Rhinomanometry and acoustic rhinometry

❖ CT scan, MRI, Allergy testing, Biopsy [5]

RHINOSCOPE

Anterior rhinoscopy, conveniential performed with a nasal speculum and headlight ,provides limited information, although it may be appropriate in severe cases or if there are major changes in a patient's condition. However, it is not adequate for diagnosis.

A straightforward evaluation of the extent of nasal blockage may be performed by having the patient breathe out with mouth closed onto a cold metal surface. [5]

Figure (4)

ENDOSCOPE

Endoscope provides intense illumination and magnification of the nasal passage and indicated for patient who experience chronic or recurrent acute rhinosinusitis symptoms, or those with suspected sinonasal polyposis. This technique can be used more effectively than simple anterior rhinoscopic examination to diagnosis anatomical variation that may cause nasal congestion. In addition, video enhanced

enhanced endoscope can be a useful teaching tool to help patients better understand their condition and the rationale for treatment. [6]

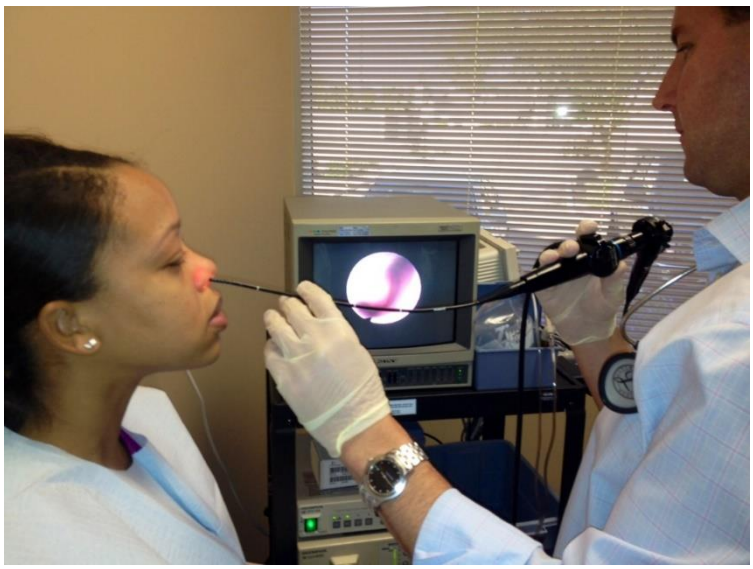


Figure (5) shows insertion of a flexible endoscope

IMAGING

Routine ordering of computed tomography (CT) scans and magnetic resonance (MRI) to evaluate nasal congestion is not justified, although these modalities maybe indicated in suspicious cases. [6]

NEOPLASM OF THE NOSE AND POST NASAL SPACE

Table (2)

BENIGN	*INTERMEDIATE*	*MALIGNANT*
Papilloma	Inverted papilloma	Squamous cell carcinoma
Ossifying fibroma		Adenocarcinoma
Osteoma		Anaplastic carcinoma
Hemangioma		Transitional cell carcinoma
Neurofibroma		Malignant melanoma
Meningoencephalocele		Rhabdomyosarcoma

Squamous papilloma

verrucous lesions similar to skin warts arise from the vestibule or the lower part of the nasal septum, single or multiple, sessile or pedunculated, treated with local excision and cauterisation of the bed, cryosurgery and laser. [7]

Inverted papilloma (Ringertz tumour)

microscopically neoplastic epithelium is seen growing towards the underlying stroma rather on the surface, 40-70 years male predominance (5:1), arise from the lateral nasal wall, always unilateral grey or red masses with marked tendency to recur after excision, associated with Squamous cell carcinoma in 10-15% of the cases, treated by wide surgical excision. [7]

Haemangioma

- Capillary haemangioma (bleeding polyps of the septum): soft dark red pedunculated or sessile tumours arising from the anterior part of the nasal septum, presented with recurrent epistaxis and nasal obstruction, treated by local excision with a cuff of the surrounding mucoperichondrium.
- Cavernous haemangioma: arise from the turbinates on the lateral wall of the nose, treated by surgical excision with preliminary cryotherapy. [7]

Osteoma

being slow growing tumours of the mature bone, most commonly located in the frontal sinus, when obstructing the mucosal flow can

lead to a mucocele, if asymptomatic then treatment is not indicated however if symptomatic surgical treatment is indicated.

Fibrous dysplasia

dysplasia transformation of the normal bone with collagen, fibroblasts and osteoid material, the disease may develop at an early age , progress actively during childhood and stabilise in adulthood, surgical excision is indicated for obstructing lesions.

Intranasal meningoencephalocele

herniation of the brain tissue and meninges through foramen cecum and cribriform plate, smooth polyp in the upper part of the nose between the septum and the middle turbinate, seen in infants and young children and the mass increase in size on crying or straining, CT scan is essential in demonstrating the defect in the skull, treatment is by frontal craniotomy, severing the stalk from the brain and repair of the dual and bony defect, intranasal mass is removed as secondary procedure after the cranial defect has sealed. [7]

Neurogenic tumours

rare tumours

- Schwannoma
- Meningioma
- Neurofibroma

Treatment is by surgical excision. [8]

Carcinoma of the nasal cavity

primary carcinoma per say is rare maybe an extension of maxillary or ethmoid carcinoma, Squamous cell variety, adenoid cystic carcinoma or an Adenocarcinoma

- Squamous cell carcinoma: it arises from the vestibule (lateral wall of the nasal vestibule), septum (mucocutaneous junction) and lateral wall (most common site involved easily extends into the ethmoid and maxillary sinuses presents as a mass in the lateral wall), treatment is by a combination of radiotherapy and surgery.
- Adenocarcinoma and adenoid cystic carcinoma: arises from the glands of mucous membranes and involves the upper part of the lateral wall of the nasal cavity. [7]

Anaplastic carcinoma

It's a highly aggressive and invasive tumour, it produces few symptoms despite It's extensive nature. [7]

Melanoma

It’s more common in women than men and occurs in individuals older than 50 , the nasal cavity and the septum are the usual sites of origin, metastasize less frequently to the cervical lymph nodes but more commonly to the lungs and brain.

AIM

To correlate the presentation of the patients with the findings on endoscopic examination.

CHAPTER TWO

PATIENTS AND METHODS

MATERIALS AND METHODS

This descriptive study was done in Al-Emamain Al-Khadhumain medical city and the data were collected from 45 patients over a period of 6 months from September 2018 to February 2019 in the Otolaryngology department, Each patient underwent thorough history and Endoscopic examination of the nose and the post nasal space.

Exclusion criteria

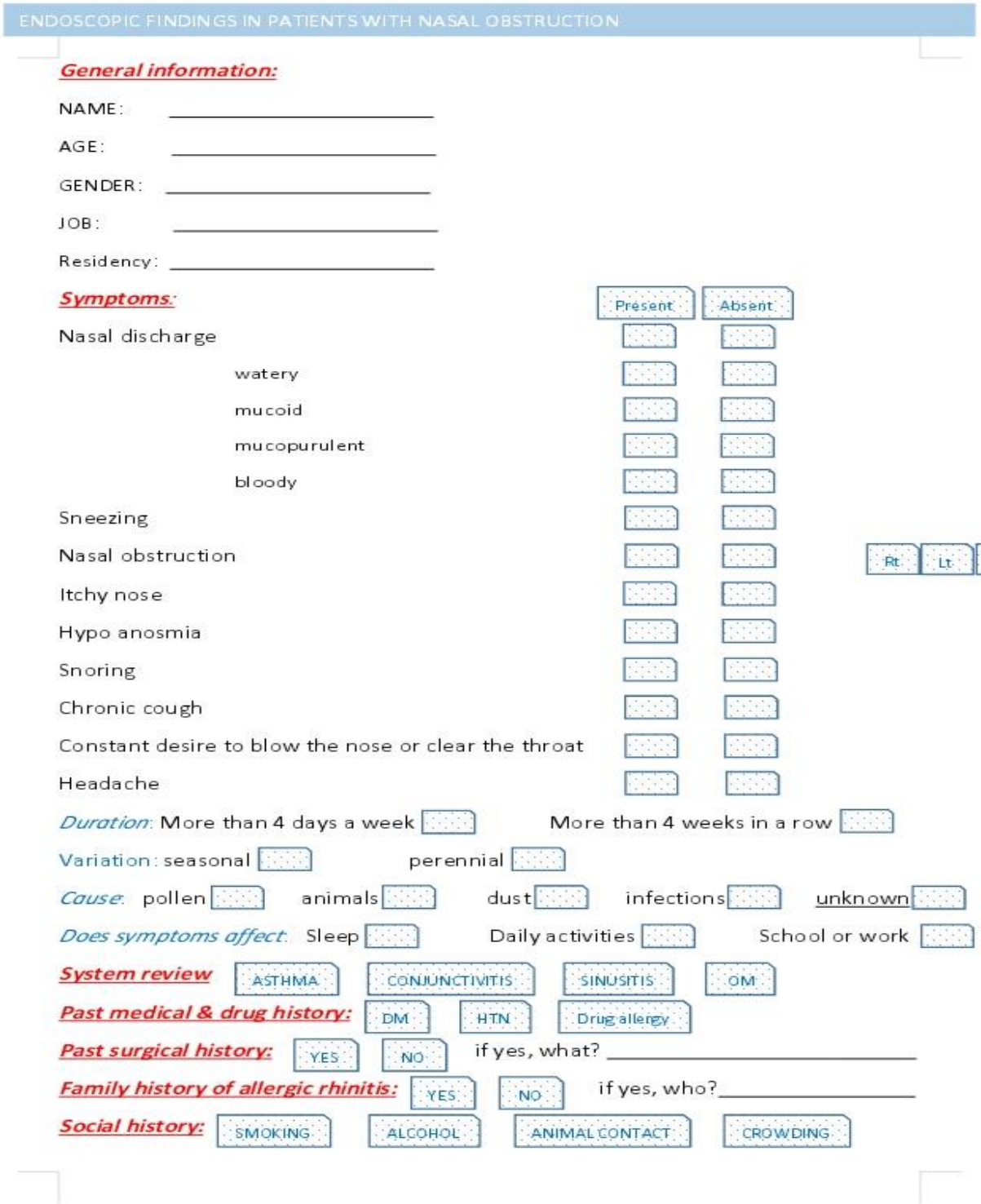
- Patients under the age of 10 years.
- Uncooperative patients

Most Important points in the history :

- ❖ Age distribution
- ❖ Gender
- ❖ Duration of symptoms
- ❖ The obstruction was unilateral or bilateral
- ❖ Associated symptoms
  - Rhinorrhea
  - Epistaxis
  - Change in smell
  - Headache
  - Snoring
  - Chronic cough
  - Seasonal variation
  - Cause
  - Eye related symptoms
  - Ear related symptoms

- Effect on Sleep
- Effect on Daily activities and work

QUESTIONNAIRE



ENDOSCOPIC FINDINGS IN PATIENTS WITH NASAL OBSTRUCTION

General information:

NAME: _____

AGE: _____

GENDER: _____

JOB: _____

Residency: _____

Symptoms:	Present	Absent	
Nasal discharge			
watery			
mucoid			
mucopurulent			
bloody			
Sneezing			
Nasal obstruction			Rt Lt Bi
Itchy nose			
Hypo anosmia			
Snoring			
Chronic cough			
Constant desire to blow the nose or clear the throat			
Headache			

Duration: More than 4 days a week ☐ More than 4 weeks in a row ☐

Variation: seasonal ☐ perennial ☐

Cause: pollen ☐ animals ☐ dust ☐ infections ☐ unknown ☐

Does symptoms affect: Sleep ☐ Daily activities ☐ School or work ☐

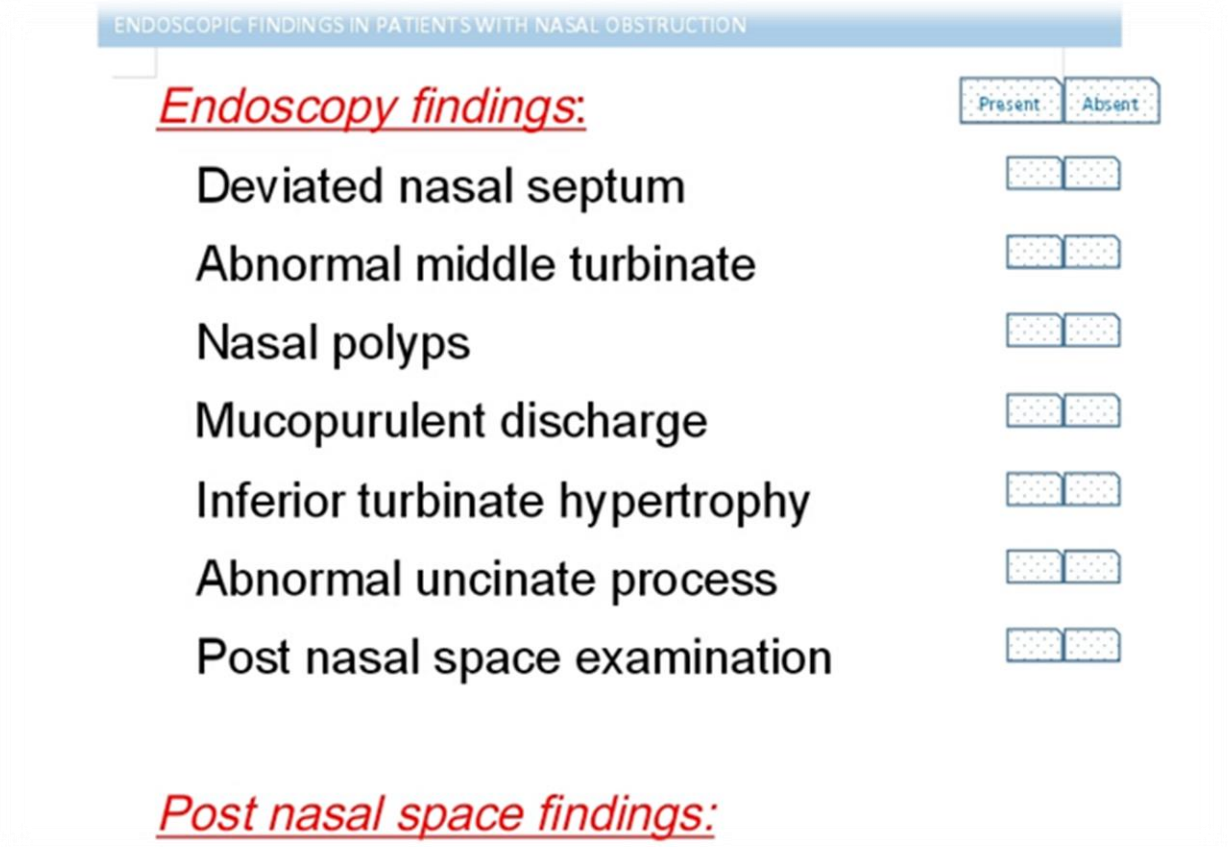
System review ASTHMA CONJUNCTIVITIS SINUSITIS OM

Past medical & drug history: DM HTN Drug allergy

Past surgical history: YES NO if yes, what? _____

Family history of allergic rhinitis: YES NO if yes, who? _____

Social history: SMOKING ALCOHOL ANIMAL CONTACT CROWDING



Post nasal space findings:

- Nasal mass or masses

- Foriegn body

CHAPTER THREE

RESULTS

RESULTS

In this study 45 patients were selected randomly who had nasal obstruction and these results were obtained

Gender

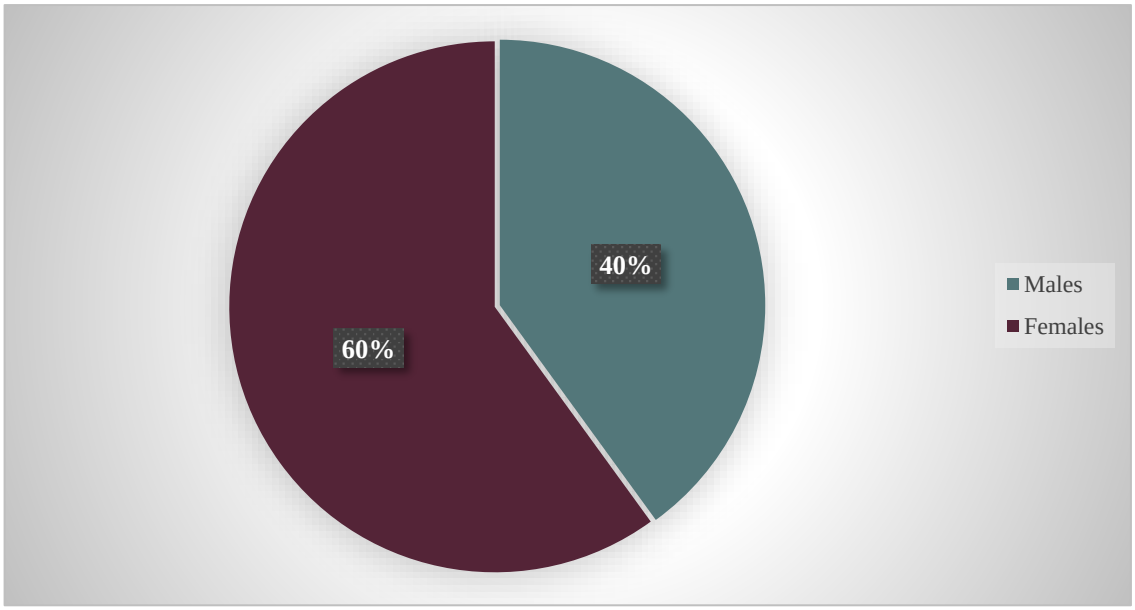


Figure (6)

Age

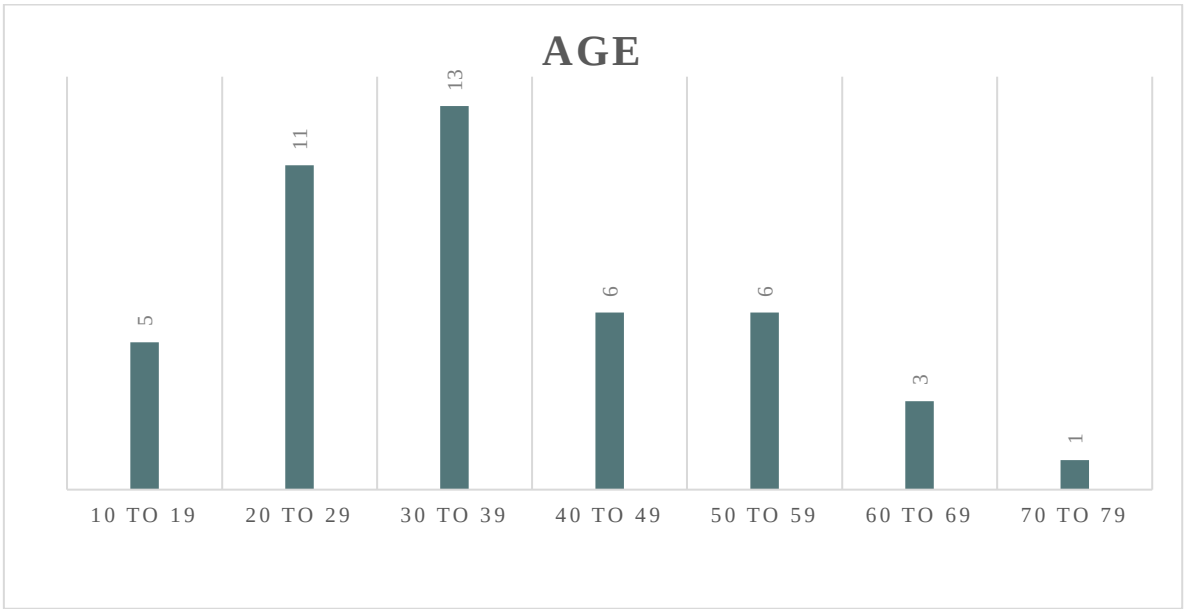


Figure (7)

Occupation

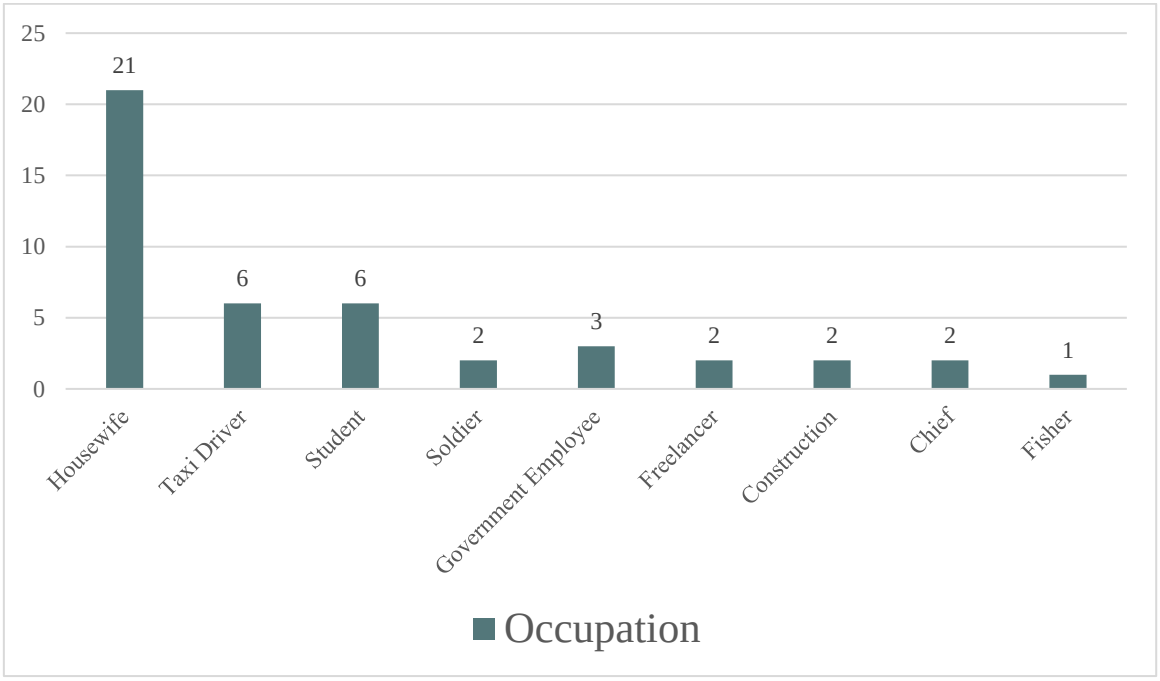


Figure (8)

Residency

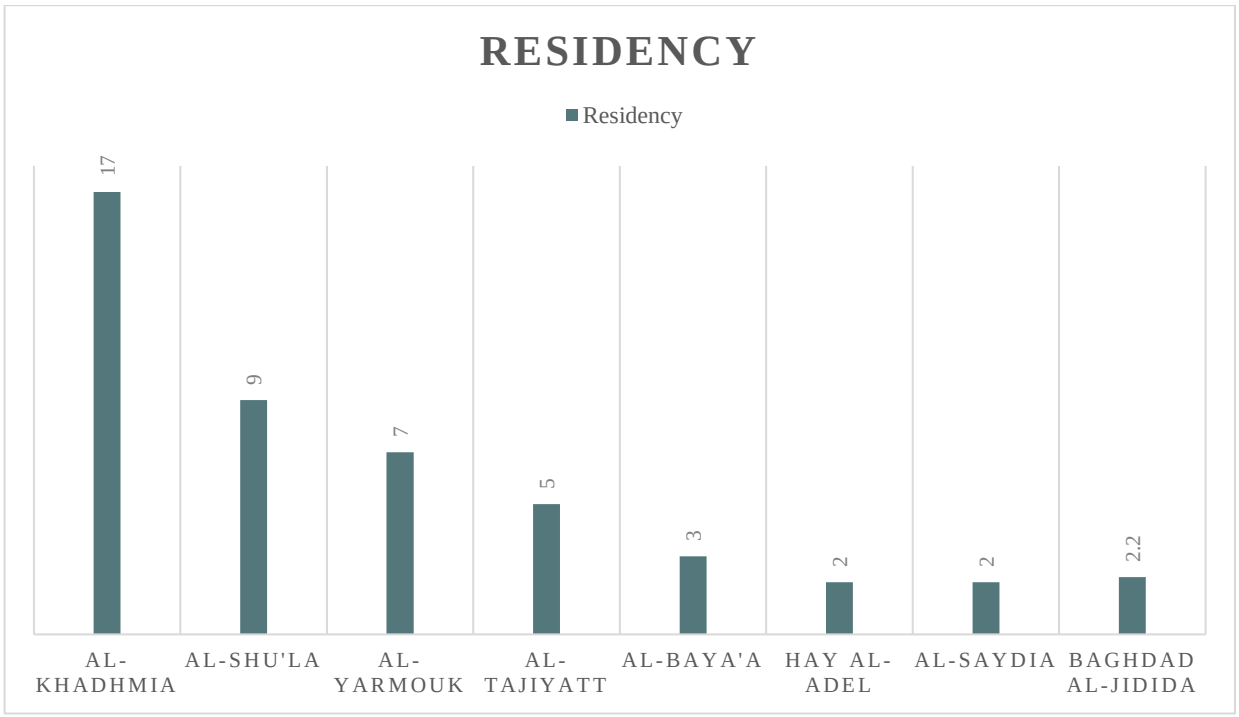


Figure (9)

Associated symptoms

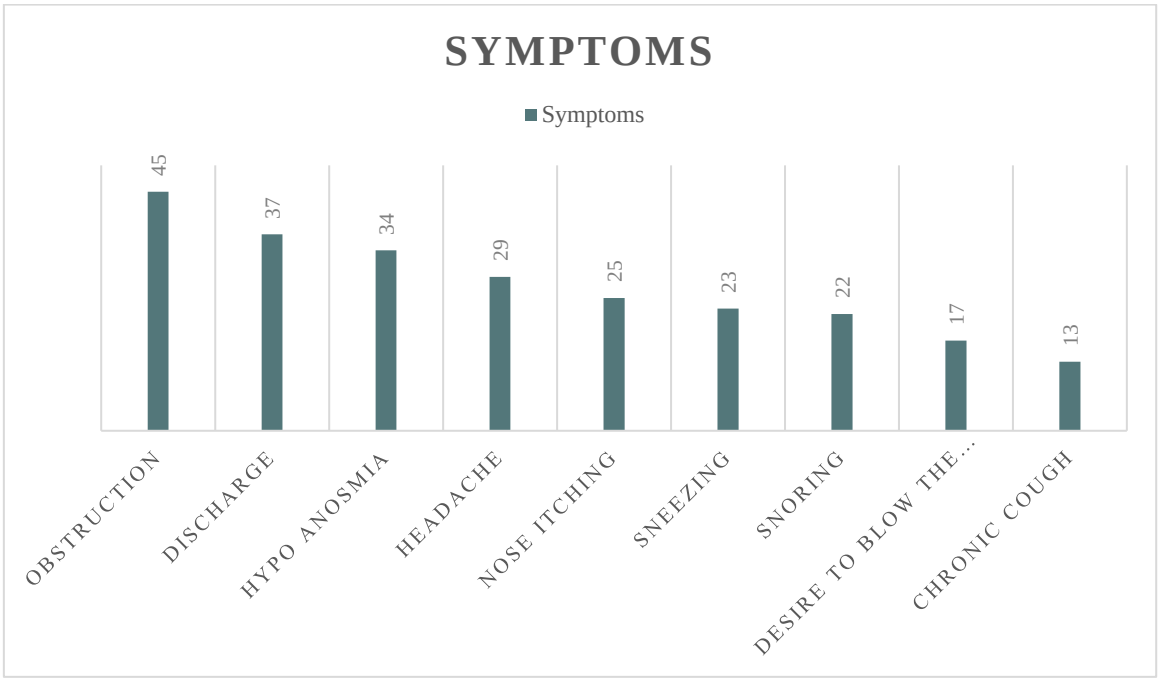


Figure (10)

System review

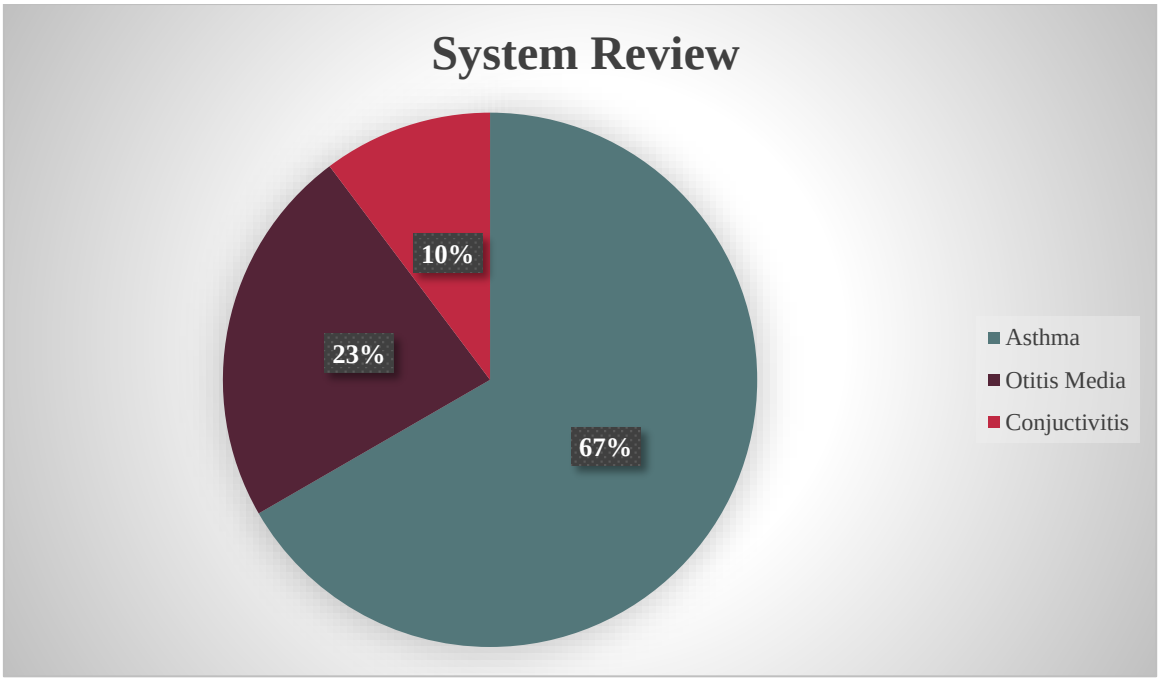


Figure (11)

Family history

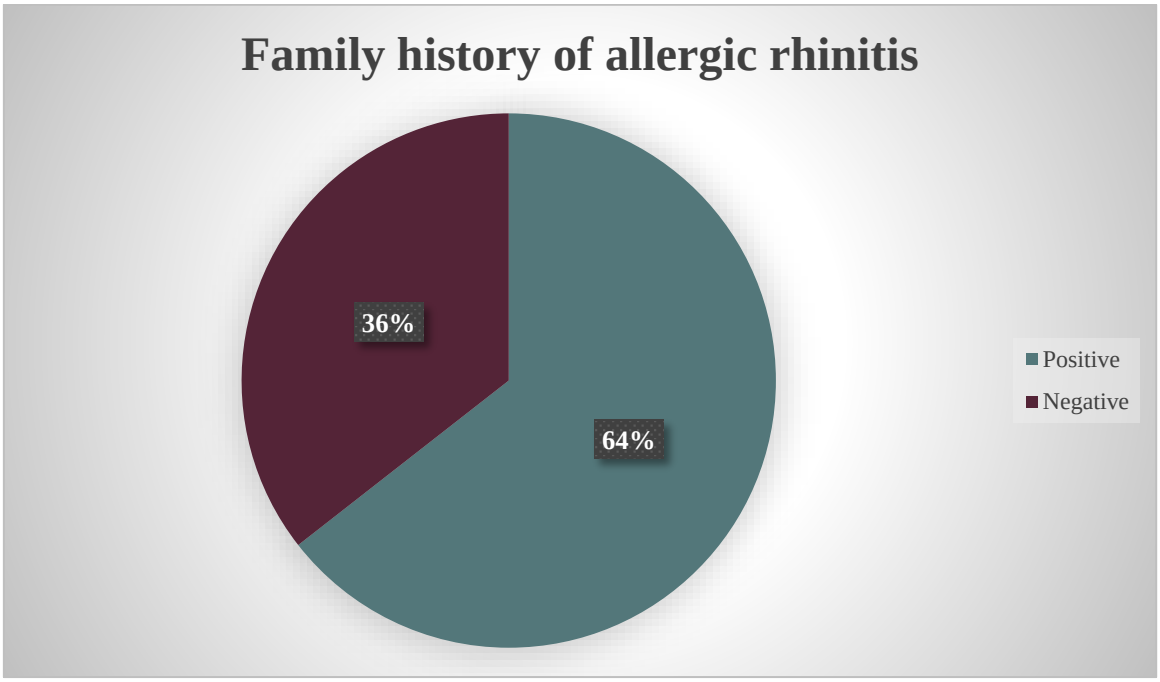


Figure (12)

Smoking

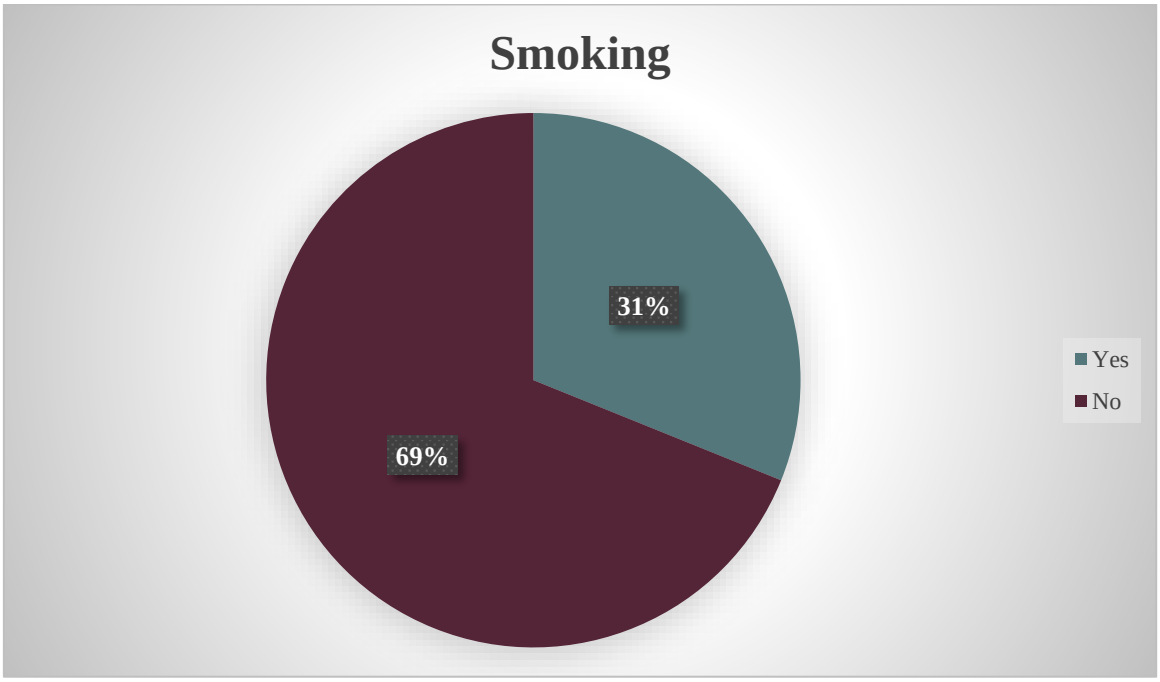


Figure (13)

Endoscopic Findings

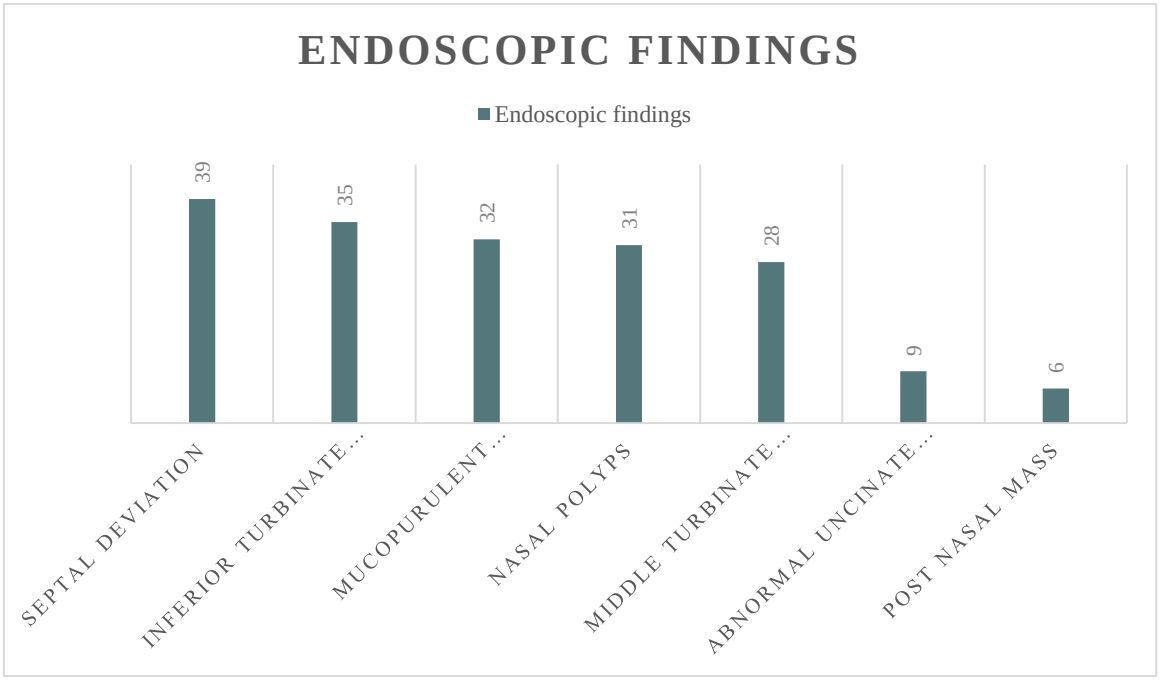


Figure (14)

CHAPTER FOUR

DISCUSSION

45 subjects were recruited for this study which was done in Al-Emamain alkhadhumain medical city, the Otorhinolaryngology department, The gender distribution shows female predominance of 60% compared to a study which was done in Curitiba Brazil which had 534 volunteers In whom 59.9% had nasal obstruction, it was more usual among Males (25%) than females (23.6%). [9]

According to the 2010 national health interview survey adjusted data, Females (15.5%) were more likely than males (9.8%) to report that they had ever been told by a physician or other health professional that they had rhinosinusitis. [10]

Further more females accounted for 63% of chronic rhinosinusitis reported in the 2010 national health interview survey. Similarly a population study of Olumstead county, Minnesota found that among patients given an international classification of disease 9 diagnosis code for chronic rhinosinusitis, 67.7% were females. [10]

The most common age groups involved were those between (30-39) and (20-29) by 13 and 11 patients respectively which accounts for about 57.8% of the population.

Compared to a study which was done in the United States that suggested that greater that 80% of the patients suffering from allergic rhinitis developed symptoms before the age of 20 years and unfortunately it is a chronic condition that resolves only in 10 to 20% over the 10 years following the diagnosis. [11]

According to a study which was done in India about the epidemiology of nasal polyps, the majority of the patients were in the middle age group (41-60) years. [12]

The mean of the age in this study was 31.9 years which is compatible with other study which had a mean of 31.2 [13] and a study which had a mean of 33.3 years. [14]

The majority of the patients were from Al-Khadhmia (37.8%) followed by Al-Shu'la (20%) and most of them were housewives (46.7%) due to the high number of females included in this study in comparison to males, the second most common job is Taxi driver, Analysis of incident cases of occupational rhinitis reported to the Finnish register of occupation diseases between 1986 to 1991 showed that occupations at increased risk include furrier, bakers, livestock breeders, food processing workers, farmers, veterinarians and boat builders. [15]

A study was done in Eskisehir turkey about the prevalence of allergic rhinitis in urban and rural areas, the study groups were randomly selected in order to sample high school students living in small town or villiges and the city centre, 246 were diagnosed as cases of allergic rhinitis by questionnaire, blood tests and skin pick test and the results showed a higher prevalence (61.8%) in urban than rural areas(46.7%). [16]

Nasal discharge (82.2%), hypo anosmia (75.6%), headache (64.4%), nasal itching (55.6%), sneezing (51.1%), snoring (48.9%) and chronic cough (28.8%).

Compared to a study done in the United States that surveyed 1011 people with allergic rhinitis , the most reported symptoms were sneezing, congestion and rhinorrhoea which were reported by 98% while 75% and 55% reported itchy and watery eyes respectively. [11]

Additional studies have confirmed that allergic rhinitis and corresponding congestion are problematic worldwide. In a cross sectional study of 9646 European adults, 40% of the subjects reported a previous diagnosis or symptoms consistent with allergic rhinitis and were referred for clinical examination, The prevalence of clinically confirmable allergic rhinitis in the general population in this survey ranged from 17% in Italy to 29% in Belgium with an overall estimated prevalence of 23% for all surveyed countries. [17]

This study showed that 57% of the patients presented to the Otolaryngology department with nasal obstruction reported having asthma which is in comparison to another study done in a tertiary center in India that included 410 patients and classified them into CRSwNP (chronic rhinosinusitis with nasal polyposis) and CRSsNP (Without nasal polyposis), The patients were administered an an asthma screening questionnaire and confirmed by pulmonary function test, of these 178 (43.4%) had CRSwNP, 166(40.5%) had CRSSNP and 66 (16.1%) had AFRS (allergic fungal rhinosinusitis), analysis revealed that 48.3% of CRSwNP, 16.5% of CRSsNP and 23.6% of AFRS had asthma. [18]

Also 7 out the 45 patients in this study had otitis media(15.6%) and 4 had conjuctivitis (8.9%).

29 of the 45 patients (64.4%) reported positive family history especially in their first degree relatives.

As compared to another study done in China that surveyed 75 patients with allergic rhinitis 42(56%) of them had positive family history and 33(44%) didn't. [19]

Also patients with chronic sinus disease had reported positive family history however no genetic abnormalities are detected in the most patients. CRS has been linked to cystic fibrosis which is most common among the northern European population and also linked to kartagener's syndrome.

14 out of the 45 patients in this study (31.1%) were smokers, this compared to a study done in Sweden between 2006 and 2008 that involved 27 879 subjects derived from three large randomly selected cross sectional population surveys, the same postal questionnaire was used in the three surveys and the results were that smoking is associated with a high prevalence of chronic rhinitis in both men and women and a low prevalence of allergic rhinitis in men, prevalence of chronic rhinosinusitis was lowest in non smokers and highest in very heavy smokers (18.5% vs 34.5%). [20]

In this study the commonest endoscopic findings In order from highest to lowest were septal deviation (86,.7%), inferior turbinate hypertrophy (77.8%),middle turbinate hypertrophy(62.2%), mucopurulent discharge (71%), nasal polyps (68.9%), abnormal uncinate process (20%) and post nasal mass (13.3%).

According to a study done in Thailand that included 83 patients with perennial allergic rhinitis to evaluate anatomic endonasal variations to correlate the symptoms with the findings, 95.2% had abnormal findings which included deviated nasal septum (72.3%), abnormal middle turbinate (49.4%), narrowing of the entrance to the frontal recess (30.1%), Septal spur (25.3%), nasal polyps (15.7%), mucopurulent discharge (14.5%), inferior turbinate hypertrophy (10.8%), abnormal uncinate process(9.6%). [21]

CHAPTER FIVE

CONCLUSION

Nasal obstruction is one of the most common complaints to the Otorhinolaryngology department, It's mostly reported by females between the age of 20-39 most of whom are housewives. The most common associated symptoms were nasal discharge and Hypo anosmia, about half of the patients were asthmatic also and few of them had eye and ear symptoms, family history is significant, one third of the patients are smokers the majority of whom are males with only 2 females,.

They are diagnosed by taking history, examination and investigations like IgE levels, skin pick tests and may sometimes require an Endoscopic examination.

The commonest endoscopic findings In order from highest to lowest were Septal deviation, inferior turbinate hypertrophy, middle turbinate hypertrophy, mucopurulent discharge, nasal polyps, Abnormal uncinate process and post nasal mass.

CHAPTER SIX

RECOMMENDATIONS

Taking into account It's prevalence, as well as the significant social and economic burden of nasal obstruction, there is a need for more effective treatment because otherwise the patients will continue to suffer from nasal obstruction and this will negatively impact the quality of their lives.

Detailed patients history and clinical examination are essential components of the diagnosis providing an initial evaluation that maybe adequate to rule our serious conditions.

Flexible nasal Endoscopy is superior to visual examination in evaluation of nasal obstruction, the cost of an office examination set is reasonable and the patient benefits are great.

One third of the patients required operation to alleviate their complaint so opening more specialised centers by the ministry of health would improve the outcome and lessen the burden on hospitals.

CHAPTER SEVEN

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