



## Study retrospective medical record to review of Otolaryngology: Institutional experience

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### General Note

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### ABSTRACT

**Background:** The consultation patterns of an otolaryngology service have not previously been reported. The Emergency departments (ED) across the world are routinely overcrowded and will likely continue to remain so due to the patients' unwillingness to wait for outpatient visits. The time, resources, and attention required to operate such consultation services are unknown. Patients with diverse otorhinolaryngologic concerns often have conditions that can be appropriately triaged and medically managed by primary care professionals. The overwhelming number of ENT related ED visits has spawned the creation of otolaryngology-specific EDs to

address this high demand for services. Consequently, most EDs continue to see a high volume of patients with ENT conditions, a large proportion of which do not need to be evaluated in the ED by an otolaryngologist-head and neck surgeon but may require outpatient follow-up.

However, recent database reviews demonstrate that individuals with poor access to health care services may be more likely to present to the emergency department (ED) for evaluation and treatment of routine conditions. Although the ED is designed to serve patients with urgent medical needs, it has become a convenient access point for many patients with non-urgent conditions, despite the extended wait times and potentially inferior clinical outcomes. *Aim of the study:* To identify the relationship between numbers of consultation each year sent to the otolaryngology department, age and location of each referring department in the facility. *Method:* Retrospective administrative database review at a tertiary referral hospital. *Results:* This is a Retrospective study of in-hospital referrals made to the department of Otolaryngology over three years and six months period in a tertiary referral hospital; the proportion of patients with consultations to an Otolaryngology department from 2015 to 2018 has increased significantly. Most cases were seen by junior members of staff and were of minor problems that could have been referred to a routine out-patient clinic. Our institute had a total number of 3539 patients with otolaryngology in hospital referrals from a variety of departments. The emergency department had a total of 1372 (38.8%) referrals, while internal medicine counted 518 (14.6%). *Conclusion:* There has been a significant increase in the volume of on-call otolaryngology consultations in our tertiary Institutions. Patients referred to the Otolaryngology department were of a varied clinical nature. Emergency department referrals were on the top of the list and then followed by internal medicine. This suggests the need for improvement in the Consultation criteria, as well as an improvement in the information provided. The need to identify changes in the volume of consultations in an inpatient setting, plus Emergency visits to set better access to care to urgent cases. Cost savings measures may be done by increasing health care access points for non-urgent concerns that can be evaluated in an outpatient setting.

**Keywords:** Consultation; otolaryngology; electronic medical records; health care; emergency referrals; internal medicine referrals.

## 1. INTRODUCTION

The meaning of otolaryngology is this branch of medicine that deals with diagnosis and treatment of diseases of the ear, larynx, and upper respiratory tract Hackett et al., (2012). Emergency departments (ED) routinely overcrowded and will likely continue to remain. The patients' unwillingness to wait for outpatient visits that cause patients with non-urgent complaints to visit EDs for care has been a critical focus of healthcare cost containment analysts. It's crucial to understand the patient behaviors and global factors, and try to control those factors in order to decrease the overload. For example, estimated that 13.7% to 27.1% of all ED patients could be treated at alternative, non-urgent care sites; factoring in utilization of time, lab tests, imaging, and specialist consultations, this would represent a potential cost savings of over \$4.4 billion annually (Snider et al., 2013). Epistaxis remains the most frequent otolaryngologic emergency and the second most common reason for referral to an otolaryngologist Ullah et al. (2002). Non-urgent conditions evaluated at the ED are also associated with higher the influx of new patients into the health care system owing to the Affordable Care Act is likely to continue to add significant burden onto emergency care professionals and those in the consulting specialties, including otolaryngology, if current trends in medicine continue (Hines and Curry, 1978). Obstructive sleep apnea (OSA) could also be associated with episodes of oxygen de-saturation, physiological condition, cardiovascular dysfunction, cor-pulmonale, and pulmonic hypertension pressure. STOP-BANG is associate degree for eight specific questions wont to assess the likelihood of OSA. If the individual exhibits 3 or additional of those indicators, he/she ought to be thought-about to be at high risk for OSA complications. Therefore, the choice of continuing with inpatient versus outpatient ENT surgery still remains controversial (Almalki et al., 2011). Subspecialty consultations are a necessary part of comprehensive medical care. They provide an opportunity for collegial interaction between physicians and the exchange of knowledge and expertise in patient management. In both the inpatient and ED settings, appropriately placed consultations provide an opportunity for patients to receive point-of-care service and arrangement of appropriate follow-up. Although the consultation patterns of other surgical specialties, including urology, orthopaedic surgery, and vascular surgery, has been previously reported, the extent of the workload imposed on a comprehensive otolaryngology service is unknown. Recent literature on consultation patterns within otolaryngology is disparate in terms of the point-of-care settings that are investigated (Conley et al., 2009). There are several advantages gained from using safety checklists. They facilitate multi-step processes to enhance team dynamics, forestall or minimize error, and act as a backup to human memory (Al-Qahtani, 2017). If you have a hearing loss and if dealing with a Hearing impaired, there are many conditions which may be related to hearing loss that might require medical attention, rather than just a hearing aid. Some of these conditions can be life threatening. Some can be

treated (Jennings and Shaw 2008). Otolaryngology (ENT) complaints such as chronic dizziness, ear problems, nasal obstruction, and sore throat are the reason for substantial numbers of ED visits. In 2011, it has been estimated that diagnoses such as dizziness and vertigo and otitis media and Eustachian tube disorders accounted for almost 4 million and 2 million ED visits, respectively (Smith et al., 2018). The most common foreign body inhaled by Saudi kids within the Eastern region has been according to be watermelon seeds (Mahmood and Al-Ghamdi, 1997). The overwhelming number of ENT related ED visits has spawned the creation of otolaryngology-specific EDs to address this high demand for services. Although these appear to be a cost beneficial method for addressing acute ENT complaints, can offload a sizeable number of general ED visits, and even augment residency education, staffing is a potential challenge and they have not yet become commonplace (Dexter et al., 2008).

Consequently, most EDs continue to see a high volume of patients with ENT conditions, a large proportion of which do not need to be evaluated in the ED by an otolaryngologist-head and neck surgeon but may require outpatient follow-up (Eccles et al., 2013). Medical history-taking and physical examination are essential tools in the practice of medicine. Complete and correct history and physical-examination notes are very important for correct diagnosing and treatment. They are additionally crucial for the completeness of the medical history that may be an elementary tool in patient care within the hospital setting (Barnawi et al., 2017). Emergency medicine is one of the most heavy service specialties as they see a wide range of cases that arrive on a daily base. No other departments can see the different cases in a typical week. The EDs serve as a safety net for patients without access to general practitioners as well as specialty care, which is more expensive and often difficult to obtain in a non-emergent situation (Mehmood, 2012). Patients seen in the adult ED with such complaints are given appointments in our otolaryngology clinic. We set out to examine patients from this referral pathway to: 1) define the most common ENT conditions presenting to a general adult ED 2) examine the difference between patients' diagnoses made by ED and otolaryngology clinic providers and 3) provide a comprehensive analysis of patient demographics, procedures performed, and follow-up rates. We intend to highlight areas for improvement of care, potential cost savings, and education (Russell et al., 2013). Department of Otolaryngology of Alnoor Hospital plays a vital important role in providing health care of Otolaryngology especially during Alhaj season for that reason, staff faces a big challenge to provide an efficient and optimized quality of service -Head and Neck Surgery provides a high quality medical care through comprehensive diagnosis, management & treatment of various otolaryngological diseases. Also, we have a unique experience in the Kingdom in Head and Neck Cancer, Cochlear Implants, Rhinology, General Otolaryngology, Otology, as well as complicated paranasal sinus and ear diseases (Bukhari et al., 2014).

There are different types of Ear Doctors in otolaryngology. A doctor who specializes in problems of the ear, nose and throat are normally called an ENT or an Otolaryngologist. If the doctor has additional training in the medical and surgical management of dizziness, hearing loss, and tumors of the ear they may be called an Otologist. If the doctor has additional training in diagnosing and treating nasal related disorders, then they might be called an Otorhinolaryngologist (Lane et al., 2001). Hearing and balance, swallowing and speech, breathing and sleep issues, allergies and sinuses, head and neck cancer, skin disorders, even facial plastic surgery are just some of the conditions that "ENT" (ear, nose, and throat) specialists treat. Professionally, ENT specialists are called "otolaryngologists" but it's easier just to say "ENT" (Nalebuff et al., 1979).

The workload of an inpatient consultation service can be derived from the otolaryngologist hospitalist model provided in a tertiary care center while the ED data can be obtained from national claims database reviews. As we continue to move forward in an era of medicine that emphasizes optimization of health care costs, imposes restrictions on resident work hours, and underscores the need for improved documentation, further scrutiny into the volume and variety of services provided by the otolaryngology consultation service is warranted to improve patient outcomes and foster inter specialty education. In this retrospective study, we investigate the patterns of ED and inpatient consultations to the otolaryngology-head and neck surgery service in a tertiary care center (de Casso et al., 2003). Important of the ENTs Functions of Life is: Imagine a singer not being able to sing, or you not being able to hear her beautiful music. Imagine not being able to smell the earth after a spring rain, or not being able to taste and enjoy your favorite holiday meal. Imagine not being able to sleep through the night next to your loved one because they snore. These are some of the fundamental functions of life that make living so rich and wonderful. Yet when one or more of these functions no longer work the way they should, living is diminished or even jeopardized. Altman, Stephens, Lyttle and Weiss

### Significance of the Study

To assess the number of consultations received to otolaryngology department from variety of departments during the period from 01/06/2015 to 30/12 /2018 through (in hospital) electronic consultation service and use the statistical analysis to pin point and identify changes in the volume of consultations in a tertiary care center.

### **Aim of the Study**

To identify relationship between numbers of consultation each year, age and location (each consulting department) Allow understanding the relationship that has led to changes in the volume of consultations sent to an otolaryngology in tertiary care center. This pattern of service has not previously been reported in our institute. Recourses and attention required to operate such impact of consultations service are not known. This information that gathered by this study, might help in the future plan to determine the staffing number needed in such facility to cover the impact of patient referrals.

### **Research Questions**

1. What are the causes that changed the volume of consultations sent to an otolaryngology over the years mentioned?
2. What is the relationship between consultations of otolaryngology and age, location (each consulting department) and the year?

## **2. MATERIALS AND METHOD**

### **Research Design**

Retrospective administrative database review at a tertiary referral hospital

### **Objective**

This study shows the relation of the volume of otolaryngology consultations in a tertiary care center over three year's period. The objective of this study was to identify relationship between the number of in hospital consultations to otolaryngology and patient age, in addition to the location (each referring department) and year.

### **Setting**

The present study was conducted at a tertiary referral hospital Saudi Arabia.

### **Study Sampling**

The current study was conducted on 3539 patients of otolaryngology consultations in a tertiary care center over three year's period. They will be collected through a secured computerized data base set in tertiary referral hospital, Saudi Arabia. Recruited according to the inclusion, exclusion criteria shown below:

### **Inclusion criteria**

- Gender: male and female
- No age limitation (all age group)
- Patient has to be admitted in the hospital at the time of the consultation and /or has a documented visit to emergency department.
- All patients need to be seen and evaluated by an otolaryngologist.
- Official consultation has to be available in the official computerized in hospital system (ETMAM).

### **Exclusion criteria**

Referral or consultation from outside the hospital

### **Ethical Considerations**

This study was conducted under the approval of the ethical committee of research and a study decorates of health affairs, Ministry of Health, Number: A00636, research approval serial number: 00970. To be conducted in tertiary care center King Abdulla Medical Complex, Jeddah, Saudi Arabia Confidentiality of information was assured and the data were accessed only by the investigators involved in the study.

### **Data Analysis**

Collected data were coded and tabulated using secured personal computer, then statistical package for social science using SPSS updated version.

### 3. RESULTS

**Table 1** location of consultation

location		
	N	%
Emergency Department	1372	38.8
internal medicine department	767	19.9
ICU	345	9.7
general surgery department	312	8.8
neurology department	170	4.8
CCU	101	2.9
neurosurgery department	90	2.5
cardiology department	81	2.3
Isolation Ward	60	1.7
respiratory medicine department	56	1.6
Digestive health and endoscopic department	46	1.3
psychiatry department	34	1.0
Ophthalmology department	31	0.9
nephrology department	28	0.8
urology department	26	0.7
dermatology department	23	0.6
orthopedic department	14	0.4
hematology department	12	0.3
staff health department	8	0.2
rheumatology department	7	0.2
Anesthesiology department	4	0.1
OBGYNE	4	0.1
cardiac surgery department	2	0.1
Dental	2	0.1
Day Surgery Unit	1	0.0
Infectious disease	1	0.0
radiology department	1	0.0
Vascular Surgery	1	0.0
Total	3539	100.0

Table 1 shows the distribution of the in hospital department otolaryngology consultation. The total of consultation number sent to otolaryngology service was 3539 patients during the period from 01/06/2015 to 30/12/2018. The most common location (Department) sent consultation was 38.8% from the Emergency Department, and patients' consultations received from the Internal Medicine Department was 19.9% listed in Table 1.

**Table 2** Distribution of the most frequent age for consultation

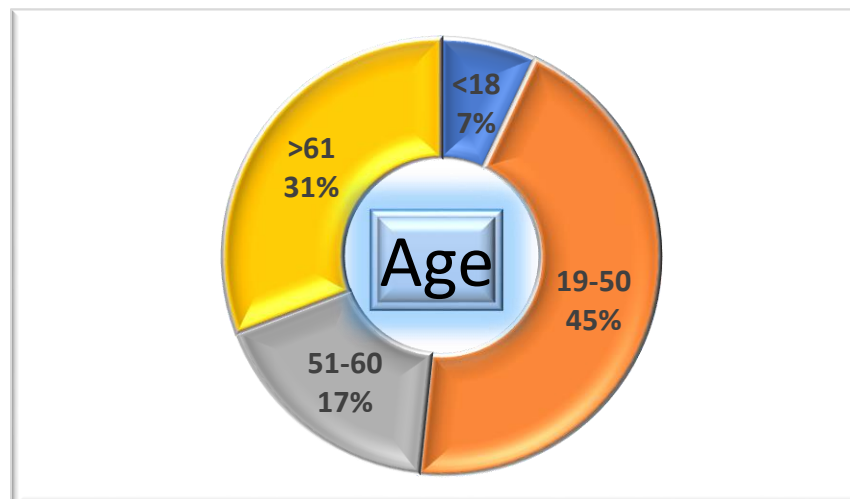
Age group		
	N	%
<18	249	7.0
19-50	1579	44.6
51-60	623	17.6
>61	1088	30.7
Total	3539	100.0

In our database we have found that ICU Department was 9.7 %, General Surgery Department was 8.8%, neurology Department 4.8 %, Primary care 3.8%, CCU 2.9%, Neurosurgery Department 2.5%, and Cardiology Department 2.3% (figure 1).



**Figure 1** Distribution of the in hospital departments for otolaryngology consultations

Table 2 and Figure 2 show the distribution of the most frequent age for consultation. The data indicated that the most common consultation age 19-50 for consultations the number is 1579, percent 44.6%. The age that follows >61 shows the number 1088 and the percent is 30.7%. The lowest proportion of consultation age <18 the number is 249 percent 7.0.

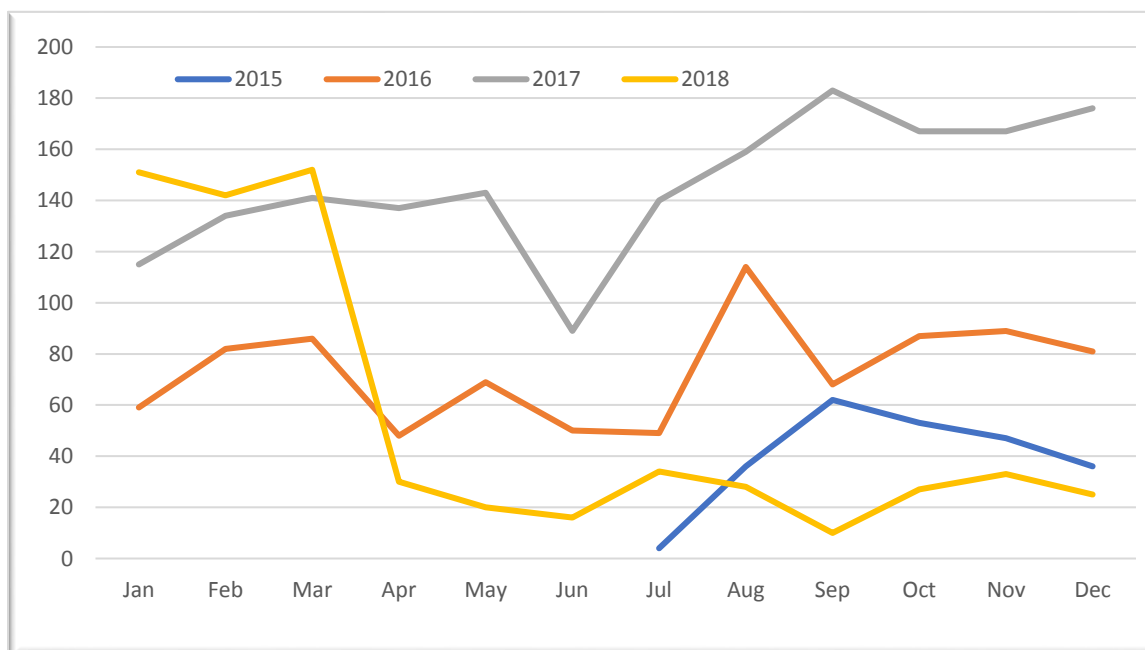


**Figure 2** Distribution of the most frequent age for consultation

Table 4 and Figure 3 show the distribution of the total consultation of an otolaryngology each year, the volume of consultations in ENT 6 months of 2015 represented total (238- 6.73%). The relatively low number related to this consultation because it took only during 6 month. The number of consultation during year 2016 (882-24.92%). followed by represented of 2018 the number of consultation during year 2018 (668 -18.88%). But the year 2017 shows the number of consultation is different (1751-49.48%) increased.

**Table 4** Distribution of the total consultation of an otolaryngology each year

	2015		2016		2017		2018		Total	
	N	%	N	%	N	%	N	%	N	%
Jan			59	6.69%	115	6.57%	151	22.60%	325	9.18%
Feb			82	9.30%	134	7.65%	142	21.26%	358	10.12%
Mar			86	9.75%	141	8.05%	152	22.75%	379	10.71%
Apr			48	5.44%	137	7.82%	30	4.49%	215	6.08%
May			69	7.82%	143	8.17%	20	2.99%	232	6.56%
Jun			50	5.67%	89	5.08%	16	2.40%	155	4.38%
Jul	4	1.68%	49	5.56%	140	8.00%	34	5.09%	227	6.41%
Aug	36	15.13%	114	12.93%	159	9.08%	28	4.19%	337	9.52%
Sep	62	26.05%	68	7.71%	183	10.45%	10	1.50%	323	9.13%
Oct	53	22.27%	87	9.86%	167	9.54%	27	4.04%	334	9.44%
Nov	47	19.75%	89	10.09%	167	9.54%	33	4.94%	336	9.49%
Dec	36	15.13%	81	9.18%	176	10.05%	25	3.74%	318	8.99%
Total	238	6.73%	882	24.92%	1751	49.48%	668	18.88%	3539	100.00%



**Figure 3** distribution of the total consultation volume of an otolaryngology each year.

**Table 5** Demonstrated in the location and Age group of service provided by consultations

location	Age group								Total	
	<18		19-50		51-60		>61			
	N	%	N	%	N	%	N	%	N	%
Emergency Department	147	59.0%	830	52.6%	182	29.2%	213	19.6%	1372	38.8%
internal medicine department	49	19.7%	279	17.7%	160	25.7%	219	20.1%	707	19.9%
ICU	9	3.6%	34	2.2%	50	8.0%	252	23.2%	345	9.7%
general surgery department	15	6.0%	114	7.2%	57	9.1%	126	11.6%	312	8.8%
neurology department	9	3.6%	91	5.8%	29	4.7%	41	3.8%	170	4.8%
CCU	0	0.0%	18	1.1%	23	3.7%	60	5.5%	101	2.9%
neurosurgery department	1	0.4%	35	2.2%	29	4.7%	25	2.3%	90	2.5%
cardiology department	3	1.2%	40	2.5%	12	1.9%	26	2.4%	81	2.3%
Isolation Ward	0	0.0%	15	0.9%	9	1.4%	36	3.3%	60	1.7%
respiratory medicine department	2	0.8%	22	1.4%	16	2.6%	16	1.5%	56	1.6%
Digestive health and endoscopic department	1	0.4%	26	1.6%	8	1.3%	11	1.0%	46	1.3%
psychiatry department	5	2.0%	18	1.1%	4	0.6%	7	0.6%	34	1.0%
Ophthalmology department	3	1.2%	8	0.5%	10	1.6%	10	0.9%	31	0.9%
nephrology department	0	0.0%	6	0.4%	8	1.3%	14	1.3%	28	0.8%
urology department	0	0.0%	8	0.5%	9	1.4%	9	0.8%	26	0.7%
dermatology department	0	0.0%	14	0.9%	4	0.6%	5	0.5%	23	0.6%
orthopedic department	2	0.8%	3	0.2%	4	0.6%	5	0.5%	14	0.4%
hematology department	2	0.8%	4	0.3%	2	0.3%	4	0.4%	12	0.3%
staff health department	0	0.0%	7	0.4%	1	0.2%	0	0.0%	8	0.2%
rheumatology department	0	0.0%	2	0.1%	1	0.2%	4	0.4%	7	0.2%
Anesthesiology department	0	0.0%	1	0.1%	2	0.3%	1	0.1%	4	0.1%
OBGYNE	0	0.0%	1	0.1%	0	0.0%	3	0.3%	4	0.1%
cardiac surgery department	0	0.0%	1	0.1%	1	0.2%	0	0.0%	2	0.1%
Dental	0	0.0%	0	0.0%	1	0.2%	1	0.1%	2	0.1%
Day Surgery Unit	0	0.0%	1	0.1%	0	0.0%	0	0.0%	1	0.0%
Infectious disease	0	0.0%	0	0.0%	1	0.2%	0	0.0%	1	0.0%
radiology department	1	0.4%	0	0.0%	0	0.0%	0	0.0%	1	0.0%
Vascular Surgery	0	0.0%	1	0.1%	0	0.0%	0	0.0%	1	0.0%
Total	249	100.0%	1579	100.0%	623	100.0%	1088	100.0%	3539	100.0%
X <sup>2</sup>	861.718									
P-value	0.000									

Table 5 demonstrated the location and Age group of service provided by consultations. In our study the majority of our consultations in the Emergency Department age 19-50 the number is (830) 52.6% followed by age >61 the number is (213) 19.6% also noticed Second age have correlation between the age 19-50 and location of consultation emergency department. in our study noticed The majority of our participants in age <18 (59.0%) consultation the emergency department the second department consultation is internal medicine department, note the high percentage of patients who required an consultation the emergency department the second department consultation in internal medicine department. In our study we find that there is a close correlation between the different ages and location of consultation, where there are many reviewers in the consultation emergency



department, this may be the reason why the disease was not known at the age of <18 (59.0% ). P-value less than 0.05 have no significant difference, X<sup>2</sup> (861.718).

#### 4. DISCUSSION

This is a Retrospective study to evaluate the number of referrals made to a department of Otolaryngology over three years and six months period review at tertiary care hospital. A total number of 3539 patient consultations received. Consultation allows an open communication and improved patient care when additional expertise is required. Although the burden of consultation services has previously been reported in various subspecialties, it has not been measured adequately for otolaryngology–head and neck surgery service. This review of ED and inpatient consultations at our tertiary care center demonstrates that patients' volumes are significantly higher than those reported in the literature. The suggestion to distribute the referrals as follow: patient with ages less than 18years (7%), and ages from 19years to 50years (44.6%), in addition to ages from 51years to 60 years (17.6%), Finally, ages more than 61 years (30.07%). We have found, the total disruption by year 2015 number of patients were (238), and by year 2016 number of patients were (882), while in year 2017 number of patients were (1751). Lastly, in year 2018 number of patients was (668). Most cases were seen by junior members of staff, referrals were of minor problems that could have been referred to routine out-patient clinic. The data showed that the proportion of patients attending to the consultation with Otolaryngology sections from 2015 to 2018 had increased significantly. The location and Age groups of service are provided by consultations. In our study the majority of our consultations are from the Emergency Department and most age group was from 19years to 50years that was 830 patient accounts for 52.6%. Then, followed by age group more than 61years was 213patients that presented 19.6% of all collected consultations. We have noted that, Second age groups that have a correlation with referrals that have sent from the emergency department were the group between 19 years till 50 years. In our data ,the majority of the participants were less than 18 years old with the percentage of (59.0%) the otolaryngology department received consultations from the internal medicine department which is the second in followed by ICU department we have noted that >61 year with the percentage of (23.2%). Note the high percentage of patients who required a consultation in the emergency department and the second department consultation is in internal medicine department. The otolaryngology department received consultations from the general surgery department then neurology department note the percentage (8.8% - 4.8%) of patients.

In the study we have found, that there is a close correlation between the different age groups and the emergency department referrals which is on the top of the list, this may be due to the reason in young age groups less than 18 years of age (59.0%) its challenging to reach to a clear diagnosis and to examine the patient in emergency setting. p-value less than 0.05 that is no significant difference, X<sup>2</sup> (861.718). This study doesn't accuse any department or colleagues referring to our service, but rather helping to filter the urgent from non-urgent cases sent to our service. That will lead eventually to give a better care through fastest and easy access to urgent care without long standing delay due to the overload of the non-urgent cases. The researches teams' future plan to document each referring diagnosis and correlate that with the number of consultations from each department, to set the most common diagnosis present to each department. Moreover, to further correlates that with the available number of junior and senior staff during each shift throughout the year. Another aria that might be of value to look into is the time of stay till each patient gets to see an otolaryngologist. Hoping to set a high standards of care to each patient, whether it's urgent or non-urgent.

#### 5. CONCLUSION

There has been a significant increase in the volume of on-call otolaryngology consultations in our tertiary institute. Patients referred to the Otolaryngology department were of a varied clinical nature. Emergency department referrals were on the top of the list, and then followed by internal medicine department. This suggests the need for improvement in the Consultation criteria, as well as an improvement in the information provided .The need to identify changes in the volume of consultations in an inpatient setting plus, Emergency visits to set a better access of care to urgent cases. Cost savings measures may be done by increasing health care access points for non-urgent concerns that can be evaluated in an outpatient setting.

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