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ORIGINAL ARTICLE

To determine the diagnostic accuracy of fiber-optic laryngoscopy in suspected Carcinoma Larynx patients.

Dileep Kumar[1], Muhammad Iqbal Rao[2], Amrat Kumar[3], Salman Ahmed[4], Ishfaque Ahmed[5], Ghullam Shabir[6]

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ABSTRACT… Objective: To determine diagnostic accuracy of fiber-optic laryngoscopy in suspected Carcinoma Larynx patients. **Study Design:** Cross-sectional study. **Setting:** Department of Ear Nose and throat at People's Medical College hospital Nawabshah, Sindh. **Period:** 1st July 2021 to 31st December 2021. **Material & Methods:** The sample size of the study was 176. The inclusion criteria involved age >20- 60 years, either gender, patients presenting with clinical symptoms of hoarseness of voice, with or without difficulty in swallowing, persistent cough, weight loss for one month, visiting outpatient department. Patients with bleeding disorders were excluded. **Results:** Out of 176 patients included in the study the mean age of the patients was 36.23± 3.7 years. Mostly the age range of the patients involved 30-35 yrs., n=76(43.2%), the male to female ratio was 1.2:1 (n=98:78) (55.7%: 44.3%). The sensitivity was 89.2%, the specificity was 78.3%, positive predictive value was 70.7%, negative predictive value was 92.5%, diagnostic accuracy was 82.3%. **Conclusion:** Our study showed that all patients with high suspicion should have undergone diagnostic testing with flexible as well as direct laryngoscopy to diagnose laryngeal cancers at early stage, so that patients benefit with early treatment with high cure rates.

Key words: Direct Laryngoscopy, Fiber-optic Laryngoscopy, Larynx Ca.

INTRODUCTION

Laryngeal carcinoma is the commonest tumor of head and neck contributing to 1% mortality and 2.4% new cases diagnosed every year globally according to 2018 statistics.[1] In Pakistan however mortality rate was 2.5% according to Global cancer observatory in March 2021.[2]

Early detection of laryngeal cancers is curable with surgical removal and preservation of larynx however the more the advanced disease, more are the worst outcomes and demands multimodal treatment. So early diagnosis is a crucial step and diagnosis rely on proper clinical history and examination followed by non-invasive and invasive investigations. Biopsy however remains to be an essential element in diagnosing histological subtyping of laryngeal cancer. Fiber-optic laryngoscopy (FOL) is a quicker, safer, cost-effective procedure for the detection of laryngeal lesions and vocal cord paralysis.[5,6] The detection of laryngeal lesions by fiber-optic laryngoscopy is far more promising and superior to direct laryngoscopy and nowadays FOL it is also used for airway management of pediatric population.[7]

Different studies have found diagnostic accuracy of FOL to be 80.65% and specificity of 77.96%, sensitivity of 89.19% while NPV of 95.83% in patients presenting with hoarseness of voice. Study by Naqvi et al revealed 39.5% lesions of vocal cords, 22.1% posterior pharyngeal wall and 15.1% lesions of pyriform fossa by flexible laryngoscopy.[5] Another study by Scolman et al identified malignant from benign lesions with sensitivity of 79.8%, specificity of 80.3%, PPV 72%, NPV of 86.2% and diagnostic accuracy of 80.1% respectively.[8]

The aim of our study is therefore to determine the

1. MBBS, DLO, FCPS, Assistant Professor ENT, PUMHS, Nawabshah.
2. MBBS, DLO, MS, Associate Professor ENT, PUMHSW, Nawabshah.
3. MBBS, MS, Assistant Professor ENT, Isra University Hyderabad.
4. MBBS, FCPS, Assistant Professor ENT, Dow International Medical College (DUHS).
5. MBBS, FCPS, Assistant Professor ENT, Bilawal Medical Hospital, Kotri. LUMHS, Jamshoro.
6. MBBS, DLO, MS, Assistant Professor ENT, Ghulam Muhammad Mahar Medical College Sukker.

Correspondence Address:
Dr. Dileep Kumar
Department of ENT
PUMHS, Nawabshah.
pilotomnivore@hotmail.com

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diagnostic accuracy of fiber-optic laryngoscopy in our setup in suspected cases of laryngeal carcinoma through biopsy to influence and utilize its usefulness compared to other available procedures.

MATERIAL & METHODS

The study was conducted on 176 patients presenting in Department of Ear Nose and throat at People's Medical College hospital Nawabshah, Sindh. Study was conducted after taking the ethical committee approval (PUMHS/SBA/PVC/168). This was a cross-sectional study conducted for period of 6 months 1st July 2021 to 31st December 2021 with non-probability purposive sampling. The study included patients age 20-60 years, of either gender, presenting in outpatient setting with clinical history of hoarseness of voice with or without any of the following symptom of difficulty in swallowing, persistent cough and weight loss for greater than 1 months and patients not willing and had any bleeding disorders or any other malignancy were excluded from the study.

Data was collected from patients and they undergone baseline labs like CBC, ESR, blood sugars and fiber-optic laryngoscopy under local anesthesia and findings were recorded and sample for biopsy was sent and waited till results. All the patients went through direct laryngoscopy under general anesthesia. The findings of examination of fiber-optic and direct laryngoscopy were recorded.

The statistical analysis was performed by using SPSS.24. Mean +/- SD was calculated from age of patient, gender and duration of symptoms. Results of fiber-optic laryngoscopy and direct laryngoscopy biopsy were compared and computed. The quantitative variables were expressed as frequencies and percentages. Chi square test was done keeping p value <0.05 to be significant.

RESULTS

Out of 176 patients included in the study the mean age of the patients was 36.23± 3.7 years. (Table-I). Mostly the age range of the patients involved 30-35 yrs, n=76(43.2%), 36-40 yrs, n=67(38.1%) and 41-50 yrs n=33 (18.8%). (Figure-1) The male to female ratio was 1.2:1(n=98:78) (55.7%: 44.3%). (Table-I)

Variables	Frequency (percentages) n=176
Age in years Mean SD	36.23± 3.7
Age range	
30-35yrs	76(43.2%)
36-40yrs	67(38.1%)
41-50yrs	33 (18.8%).
Gender M:F	98:78 (55.7%: 44.3%).

Table-I. Demographics

Patients mostly presented with symptoms of hoarseness of voice/ change in voice n=170, weight loss n=135, difficulty in swallowing n=90, persistent cough n=98 patients. Mostly patients have two or more symptoms at presentation. All patients presented with these symptoms went through investigations, fiber-optic laryngoscopy and then direct laryngoscopy. On fiber-optic laryngoscopy, there were n=82 cases who showed findings consistent with carcinoma in situ or early well differentiated cancers, while the remaining n=94 cases did not show any such findings. When these patients went through DL, n=65 were positive for laryngeal carcinoma while n=111 didn't show any evidence of laryngeal carcinoma. (Table-II). When compared through chi square, the true positives were n=58 n=24 false negative for DL, true negatives were n=87, false negatives n=7. The sensitivity was 89.2%, the specificity was 78.3%, positive predictive value was 70.7%, negative predictive value was 92.5%, diagnostic accuracy was 82.3%. (Figure-2). The p-value was significant as when compared showed statistically significant value.

DISCUSSION

Carcinoma larynx contribute to 1.0% cancer worldwide however in a recent study by Lail et al it contributes to 34.1% cases of squamous cell cancers of larynx. Due to this increasing incidence in Asian countries diagnostic methods like fiber-optic laryngoscopy which is confirmatory should be carried out vigilantly in susceptible individuals.

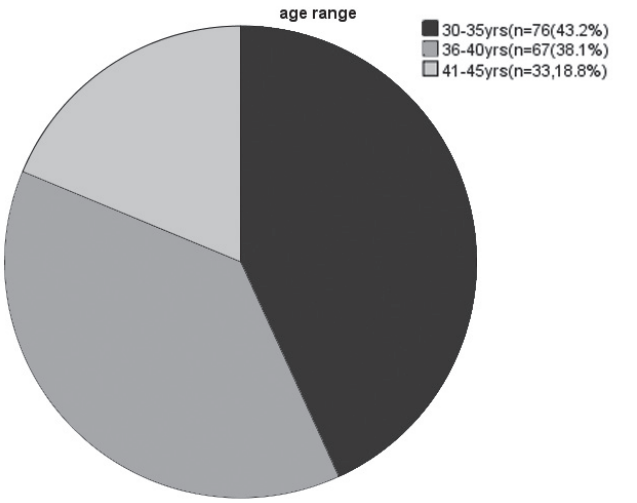

Figure-1 Patients with Symptoms

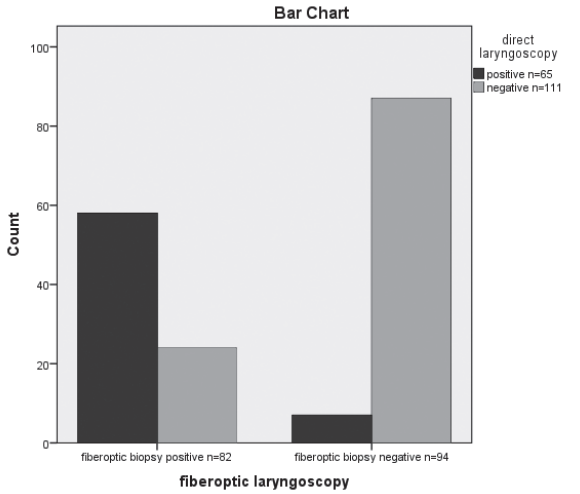

Figure-2

In our study, 32.9% cases were diagnosed as having laryngeal cancers, and most of tumors diagnosed are well differentiated squamous cell carcinoma with no nodal or distant metastasis present.[8] However, some have shown metastasis on presentation. This is consistent with study conducted at southern Punjab Pakistan.[8-11]

In our study mostly the patients belong to age group 30-40yrs with slight increase in males to female ratio in Pakistan and abroad too. The age group and male to female ratio is consistent with many studies.[8-12] On the contrary Riaz et al has found laryngeal cancer to be the disease of elderly with increasing male preponderance.[10] In US this incidence among males has been decreased from 12:1 to 5:1 over period of ten years.[2]

The patients suspected of having laryngeal cancers went through investigations and then flexible and direct laryngoscopy were done. The sensitivity of flexible laryngoscopy was 89.2%, the specificity was 78.3%, positive predictive value was 70.7%, negative predictive value was 92.5%; while the rest of suspected cases came negative turned to have benign lesions. Studies have shown flexible oral laryngoscopy to have 100% sensitivity and 75.6% specificity.[13-15] Khan et al has found sensitivity of 89.19%, specificity of 77.96% positive predictive value of 55.93% and negative predictive value of 95.83% and diagnostic accuracy of 80.65%. Our study showed also showed diagnostic accuracy of 82.3%.[3]

Therefore, patients with high suspicion of cancer larynx should undergo flexible laryngoscopy and direct laryngoscopy too in order to avoid bias. Around n=24 (13.6%) patients turned positive on flexible doesn't showed any findings on direct laryngoscopy and confirmed through biopsy. The chi square testing when compared showed statistical significant value. Several studies compared FOL to be easy accessible and easy to use technique however all other high risk cases with increasing index of suspicion showed undergo DL too. FOL although not diagnostic but is safer and easy to use in most common suspected laryngeal lesions. However, DL is a confirmatory test for patients with high index of suspicion.[3]

Mostly diagnosed cancers were early stage cancer and thus have increased cure rates with localized treatments of radiotherapy and surgery. Recently detailed report on laryngeal cancers have also reported 80-90% cure rates in early stage cancers, however the advanced stage cancers needs laryngectomy together with chemotherapy and radiotherapy.[16] A multidisciplinary team is required for management of early as well as advanced level tumors.[17-20]

CONCLUSION

Our study showed that all patients with high

suspicion should undergo diagnostic testing with flexible as well as direct laryngoscopy to diagnose laryngeal cancers at early stage, so that patients benefit with early treatment with high cure rates.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Dileep Kumar	Conception of idea, Data collection.	
2	Muhammad Iqbal Rao	Supervision, Review article.	
3	Amrat Kumar	Statistical analysis.	
4	Salman Ahmed	Proof reading.	
5	Ishfaque Ahmed	Article writing.	
6	Ghullam Shabir	Article review.	