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Prevalence of external and internal lymphedema secondary to head and neck cancer treatment

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ABSTRACT

Background: Patients of head and neck cancer are at risk of developing secondary lymphedema after being treated for head and cancer. The purpose of this study was to examine the prevalence of secondary head and neck (HNL) lymphedema in post treated patients of head and neck cancer (HNC).
Methods: This was a prospective observational study including 48 head and neck cancer patients who were atleast 3 months post treatment. The present study was conducted in the department of ENT, GMC Jammu for a period of 1 year from February 2018 to March 2019.
Results: Forty patients (43.34%) were males and 8 were females with age ranging from 25 to 82 years. 58.33% patients in our study had some form of lymphedema. Out of these patients, 21.43% had only external lymphedema, 35.71% had only internal lymphedema and 42.86% had combined lymphedema.
Conclusions: Lymphedema should be examined in the patients with head and neck cancer patients.

Keywords: Lymphedema, Head and neck, Cancer, Prevalence

INTRODUCTION

Lymphedema is a common complication of head and neck cancer treatment. It leads to significant symptom burden, function deficits and decreased quality of life.[1] It is reported that >50% of the treated head and neck cancer will develop some degree of lymphedema (HNL).[2-4] HNL is characterized by blockage of the lymphatic system of head and neck commonly after the surgery, radiation or tumor infilteration of the of soft tissues.[5,6] Patients may develop lymphedema externally on face and neck or internally in the larynx and pharynx. This study was conducted to examine the prevalence of secondary lymphedema after head and neck cancer treatment in patients being treated in our institute.

METHODS

The study was conducted in department of ENT, SMGS hospital, GMC, Jammu for a period of 1 year from February 2018 to March 2019. Patients with treated head and neck cancer attending the follow up clinic in the ENT OPD were enrolled for the study.

Inclusion criteria

- More than 3 months of completed treatment for head and Neck cancer.
- No evidence of the residual or recurrence of the tumor.

Exclusion criteria

- Patients undergoing radiotherapy or chemo therapy.
- Patients with metastatic cancer or any other active cancer.

48 patients of head and neck cancer who were seen at follow up on OPD basis were enrolled for the study. Informed and written consent was taken. Demographic data was extracted from the patients including age, sex, education level, marital status, residence, smoking and alcohol consumption.

Methods of assessment of lymphedema

External lymphedema

Assessment of external lymphedema was done using ACS (American cancer society) Lymphedema Scale.[7] According to this scale external lymphedema is divided into four stages from 0-III, higher stages indicate more severe lymphedema. This scale assesses edema of affected sites (from local to general) and functional impairment (from none to severe). Stage 0 indicates that edema is local and does not affect regular functions, stage I is local swelling and regular functions are affected. Stage II is generalized swelling in the face or neck affecting regular functions and stage III is severe swelling accompanied with ulcers on the skin or brain swelling; ability to eat is severely affected.[8]

Internal lymphedema

Internal lymphedema was assessed by flexible fibre-optic endoscopy. The internal edema was graded according to the Patterson's scale.[9] According to this scale, four grades are used to rate the level of internal lymphedema including normal, mild moderate and severe. Edema of 11 sites in the larynx and hypopharynx and two spaces are included for the grading. This scale attributed to the fibrotic changes during irradiation along with disruption of the lymphatic channels.

Statistical analysis

Data analysis was done using SPSS 17.0 (SPSS Inc., Chicago, IL). Descriptive statistics were used for the variables such as demographic status, head and neck cancer disease and lymphedema characteristics.

RESULTS

Forty eight patients with head and neck cancer attending ENT clinic for the follow up were enrolled in the study. 40 (43.34%) patients were male and 8 were female with age ranging from 25 to 82 years. Most of the patients were married (77%). Most of the patients belonged to the rural area (79.17%). 35 (72.91%) patients were smokers and 30 (62.5%) consumed alcohol.

Characteristics of the disease and the treatment are shown in the Table 2. Laryngeal malignancy was most frequently associated with the occurrence of lymphedema (39.58%). Most of the patients had advanced stages of the disease (stage III and stage IV). 44 of the 48 patients had squamous cell carcinoma.

Table 1: Demographic characteristics (n=48).

Characteristics	Frequency N (%)
Gender	
Male	40 (43.34)
Female	8 (16.67)
Education level	
Literate	32 (66.67)
Illiterate	16 (33.34)
Marital status	
Married	37 (77.08)
Single/widowed	11 (22.91)
Residence area	
Rural	38 (79.17)
Urban	10 (20.83)
Smoking	
Smoker(active)	10 (20.83)
Ex-smoker	25 (52.08)
Non-smoker	13 (27.08)
Drinking alcohol	
Yes	30 (62.5)
No	18 (37.5)

Table 2: Site and disease characteristics of the head and neck cancer.

Characteristics	Frequency N (%)
Location	
Oral cavity	12 (25)
Oropharynx	6 (12.5)
Nasopharynx	1 (2)
Hypopharynx	10 (20.83)
Larynx	19 (39.58)
Tumor staging at the time of diagnosis	
Stage I	2 (4.17)
Stage II	9 (18.75)
Stage III	20 (41.67)
Stage IV	17 (35.41)
Type of tumor	
SCC	44 (91.67)
Non-SCC	4 (8.33)
Treatment received	
Radiation alone	21 (43.75)
Radiation and surgery	15 (31.25)
Radiation and chemotherapy	12 (25)

SCC- squamous cell carcinoma.

Based on physical examination, 18 (58.33%) of the 28 patients had external lymphedema as per the ACS lymphedema Scale. Internal lymphedema was present in 20 (35.71%) patients. It was graded as per the Patterson scale and was present if one of the sites showed edema. The prevalence of lymphedema is shown in the Table 3. External lymphedema grading and distribution is presented in Table 4 and internal lymphedema prevalence as well as its severity and location is summarised in Table 5.

Table 3: Prevalence of secondary lymphedema.

Prevalence	Frequency N (%)
Type of lymphedema	
No lymphedema	20 (41.67)
Lymphedema present	28 (58.33)
Total	48 (100)
Distribution of lymphedema type	
External lymphedema type	6 (21.43)
Internal lymphedema only	10 (35.71)
Combined lymphedema	12 (42.86)
Total	28 (100)

Table 4: External lymphedema stages (n=18).

Lymphedema grade	Frequency N (%)
Stage 0	11 (61.11)
Stage I	5 (27.78)
Stage II	2 (11.11)
Stage III	-
Total	18 (100)

Table 5: Internal lymphedema stages.

Internal lymphedema	Frequency N (%)
No lymphedema	28 (58.33)
Mild lymphedema	8 (40)
Moderate lymphedema	9 (45)
Severe lymphedema	3 (15)
Total	48

DISCUSSION

HNL is commonly associated with HNC treatment and is associated with symptom burden, functional morbidities and poor quality of life[1]. Significant lymphedema of face mouth and neck can lead to disturbance during speech and auditory perception.[1] It can also lead to problems while walking due to hindrance of vision because of facial edema. Internal lymphedema can cause difficulty in swallowing and respiratory difficulty. While the symptoms of HNL are grave, little research has been done in this aspect. This study has been done to assess the extent of internal as well as external lymphedema in the HNC patients who had been completely treated for more than 3 months.

Our result showed that 58.33% patients in our study had some form of lymphedema. Out of these patients, 21.43% had only external lymphedema, 35.71% had only internal lymphedema and 42.86% had combined lymphedema. Similar kind of study was done by Deng et al 2012 demonstrated lymphedema present in 75.3% patients. 9.8% of the participants had external lymphedema, 39.4% were seen with internal lymphedema and 50.8% with combined lymphedema. However, he used the Foldi's lymphedema grading scale for the assessment of external lymphedema. Patterson's scale was used for assessment of internal lymphedema. Some Euorpean studies also reported the prevalence of secondary lymphedema.[3,4,10] One study reported 48.4% of the cases who developed submental or supraglottic lymphedema after treatment for HNC.[3] Other study reported that 17%-36% of the participants had external lymphedema after surgery.[4] Wolff et al found that subcutaneous lymphedema had developed in 12% of the patients who were treated for HNC.[10]

Measurement of secondary lymphedema in the population with head and neck cancer has not been uniformly reported because there is no clearly defined scale. There is wide variation of the assessment tools used for lymphedema in HNC among different researches. There are several scales available.[8] We had adopted ACS Lymphedema scale for the assessment of external lymphedema. This scale includes the critical descriptive components-severity of edema, lymphedema affected areas and functional impairment. Patterson's scale was used for the assessment of the internal lymphedema as this scale is specifically developed for assessment of internal lymphedema in anatomical sites of larynx and pharynx in irradiated patients.[9]

External lymphedema was seen in a total of 18 out of 28 patients. Out of these 18 patients, 61.11% were in stage 0, 27.78% were in stage I and 11.11% were in stage II. None of the patient assessed had stage IV lymphedenopathy. Internal lymphedema was seen in 41.67% of the patients in our study. Of those patients with internal lymphedema, 40% patients were having mild degree of lymphedema, 45% had moderate and 15% had severe form. Comparable results were reported by Deng et al 2012 with 34.5% of their participants had mild, 45.5% had moderate and 20% had severe form of lymphedema.[5] Most frequents sites for internal lymphedema was seen in arytenoids, pyriform sinuses, interarytenoid area, aryepiglottic folds and false vocal cords followed by other sites.

So, high prevalence was seen in the present study as well as in the previous studies suggesting that patients should be made aware of the development and manifestation of secondary HNL after treatment. A high prevalence rates and severity of the secondary lymphedema suggest that

current approach assessment of lymphedema should be reconsidered. A more reliable and accurate scale need to be developed so that any discrepancy does not occur in the future studies. Early detection and treatment of lymphedema will lead to improved quality of life in head and neck cancer patients. Further work is required in this area of concern so that secondary lymphedema is better assessed and managed accordingly.

CONCLUSION

Secondary lymphedema after treatment of HNC has high prevalence. Lymphedema involves both the skin as well as internal mucosa. It is associated with many symptoms and signs which cause functional morbidity as well as psycho-social impairments to these patients. Routine lymphedema assessment of HNC patients is necessary to assess the severity. Treatment should be planned accordingly to relieve them of the symptoms in order to improve their quality of life.

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