

Frequency of Lymphedema in Patients who Underwent Regional Nodal Radiation for Breast Cancer

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ABSTRACT

Aim: To determine the frequency and grading of lymphedema (LE) in patients who underwent regional nodal radiation for Breast Cancer in the Department of Radiotherapy and Oncology, Nishtar Hospital Multan.

Methods: Total 163 cases of breast cancers that had undergone regional node radiation with age range from 30-60 years were selected. Patients with arm edema before treatment, heart failure and chronic liver disease were excluded. Circumference of the affected part was measured in all selected cases and lymphedema grades were noted. Data was entered and analyzed by using SPSS v19. Chi-square test was applied to determine the association of age with frequency and grading of LE.

Results: Mean age of patients was 48.64 ± 5.62 years, 68 (41.72%) of females were in age group 51-60 years, 54 (33.13%) in 41-50 years and 41 (25.15%) in 30-40 years' age group. Lymphedema was present in 60 (36.81%) cases of breast cancer that had undergone regional lymph node radiations while 103 (63.19%) had shown no complaint of lymphedema. Grade I (mild edema) was seen in 15 (7.97%), Grade II (moderate edema) in 20 (12.27%) and Grade III (severe edema) in 27 (16.56%) patients.

Conclusion: This study concluded that the frequency of lymphedema in patients who underwent regional nodal radiation for breast cancer was 36.81% in this study with higher percentage of Grade III lymphedema (16.56%).

Keywords: Regional nodal radiation, lymphedema.

INTRODUCTION

Breast cancer is one the most common cancers among females and is the 2nd common cause of death due to cancer after lung carcinoma¹. Recent evidence has supported the use of regional nodal irradiation (RNI) after breast conservation surgery or mastectomy significantly lowers the risk of reoccurrence, metastasis and mortality due to breast cancer^{2,3}. Although treatment of breast carcinoma has very good prognosis; but on the risk of later toxicities and lymphedema (LE). Lymphedema is associated with significant physiological and physical disability⁴⁻⁶.

It is hypothesized that LE develops as a result of axillary lymph nodes obstruction mainly caused by axillary surgery, due to radiation therapy or due to tumor mediated obstruction.⁷ However, there are no significant differences in LE and it is difficult to differentiate the cause of edema. It is now accepted that the causes of LE are multi-factorial and different factors are responsible for this such as patient's height, weight, variations in lymph edema, and some tumor related factors and type of management options used^{8,9}.

Different prospective and retrospective studies have reported LE in 9% to 65% cases depending upon the methods of detection and measurement parameters used for diagnosis of LE.¹⁰⁻¹² Studies have reported higher risk of lymphedema in patients who underwent axillary nodal resection or regional nodal radiations¹³.

The aim of this study was to determine the frequency of lymphedema in breast cancer patients who underwent regional nodal radiation; so that proper management protocols in our routine practice guidelines could be taken

in these particular patients in order to reduce lymphedema and its associated morbidity.

METHODS

This cross sectional study was conducted from Nov. 2013 to May 2014. In this study we reviewed the data of 163 female patients who underwent regional nodal radiation for biopsy proven breast cancer having age 30 to 60 years. Female patients having cardiac morbidity (heart failure), liver disease or presence of LE before starting treatment were excluded. Approval from IRB of Nishtar Hospital was taken. Written consent was also taken from all enrolled patients by ensuring them the confidentiality of information. Changes in arm volume were noted in all follow-up visits. LE was labelled if increase in arm volume of >10% after 3 months of final treatment was noted. Then circumference of the affected part was measured in all selected cases and lymphedema grades were labeled as following::

Grade-1; mild edema involving only hand or forearms/ foot of lower leg with increase in arm/leg circumference <4 cm, **Grade-2;** Moderate edema of entire limb or its adjacent trunk quadrant with increase in limb circumference from 4-6 cm, **Grade-3;** severe edema involving complete limb and its adjacent quadrant with increase in circumference >6 cm.

Data was entered and analyzed by using SPSS v19. Frequency and grading of LE was presented in form of frequency and percentage. Chi-square test was applied to determine the association of age with frequency and grading of LE by taking p-value ≤ 0.05 as significant effect.

RESULTS

Mean age of 48.64 ± 5.62 years. Majority, 68 (41.72%) of females were in age group 51-60 years; 54 (33.13%) in 41-50 years' age group and 41 (25.15%) in 30-40 years' age group. Lymphedema was present in 60 (36.81%) cases of breast cancer that had undergone regional lymph node

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radiations while 103 (63.19%) had shown no complaint of lymphedema. Circumference of the affected part was measured all selected cases and lymphedema grades were noted. Grade I (mild edema) was seen in 15 (7.97%), Grade II (moderate edema) in 20 (12.27%) and Grade III (severe edema) in 27 (16.56%) patients (Fig. 1). There was significant association of age with frequency of LE, incidence of LE was lowest and in 51-60 years' age group and was highest in 30-40 years age group (Table 1). However, no association of age was observed with grading of lymph edema (Table 2).

Fig. 1: Grading of lymphedema.

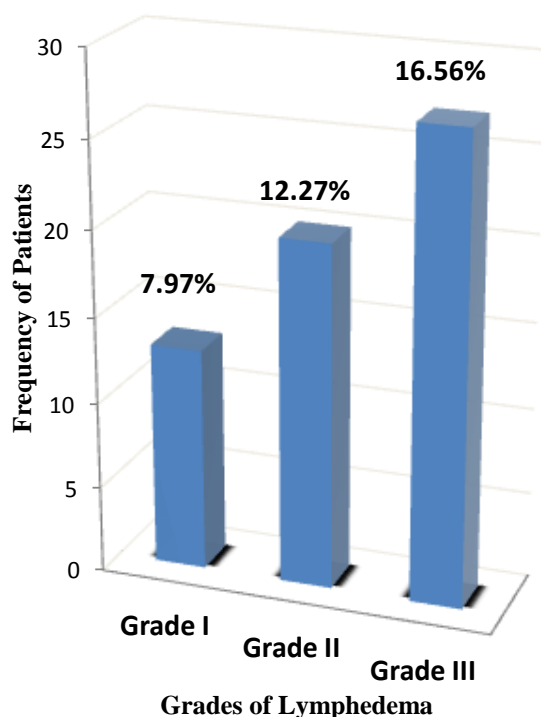


Table 1: Association of Age with Frequency of Lymphedema.

Age in years	n	Lymphedema	
		Present	Absent
30-40	41	20 (48.78%)	21 (51.22%)
41-50	54	25 (46.30%)	29 (53.70%)
51-60	68	15 (22.06%)	53 (77.94%)

P value 0.004

Table 2: Association of Age with Grading of Lymphedema.

Age in years	Grade I	Grade II	Grade III
30-40 (n=41)	5(12.19%)	4(9.76%)	11(26.83%)
41-50 (n=54)	6(11.11%)	9(16.67%)	10(18.52%)
51-60 (n=68)	2(2.94%)	7(10.29%)	06(8.32%)

P value 0.520

DISCUSSION

The mean age of patients in our study was 48.64±5.62 years with majority of the patients 41.72% were between 51 to 60 years of age. Pillai et al. and Ozaslan et al. who had found a mean age of 51.2 and 51.3 years respectively

which is very much comparable to our study^{14,15}. Other others have reported incidence of 1.5/100,000 in females of age 20-24 years to a maximum of 421.3/100,000 in females of age 75-79 years with a median age of 61 years¹⁶. In 2011 in England 41,000 new cases of breast cancer were reported, nearly 80% of these were of age ≥50 years¹⁷.

This study has shown the frequency of lymphedema as 36.81% in patients of breast cancer who underwent regional nodal radiation. Many previous studies have shown 20% to 40% incidence of lymphedema in women treated for breast cancer.^{18,19} The reported incidence of lymphedema in women treated with surgery and radiation for breast cancer ranges from 6 to 89%^{18,20}. The wide variation in reported lymphedema incidence is due, in part, to 1) difficulties in measurement and 2) problems with diagnosis. The incidence of lymphedema following mastectomy with axillary lymph node dissection has been reported to be 20% to 40%²¹. Chandra et al. reported LE in 22% patients at a mean follow-up period of 29.3%²².

Warren et al. reported LE in only 6.8% patients after regional nodal radiation. These authors reported axillary lymph node dissection, higher number of resected lymph nodes, BMI and early post-op swelling as contributing factors of LE²³.

Excluding surgical and radiotherapeutic factors other risk factors for LE are; age, obesity, wound infection, presence of co-morbid conditions, stage of disease and systemic therapy^{22,24,25}. In our study, incidence of lymphedema was found more in age less than 50 years. These results contradict the findings of Pezner RD et al. and Kiel KD et al. who has reported the higher incidence of lymphedema at age greater than 60 years²⁶. In other studies, age was not found to influence the development of lymphedema^{22,27,28}. On the whole, it was concluded that frequency of lymphedema in breast cancer patients who underwent regional node radiation is high with grade III predominance and inversely proportional to age.

CONCLUSION

This study concluded that the frequency of lymphedema in patients who underwent regional nodal radiation for breast cancer was 36.81% with high percentage of Grade III lymphedema. So, we recommend that there should be proper and regular follow up of breast cancer patients who underwent regional nodal radiation for development of any lymphedema, so that it's early diagnosis and effective future strategies for management of lymphedema could be taken to decrease morbidity of these particular patients.

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