Impact of Dyspnea on Functional Capacity in Breast Cancer Patients

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Abstract

Background and Objective: Breast cancer in females stands most common cancer in India with rate of incidence as 25.8 per 1,00,000 females. In breast and lung cancer dyspnea is more commonly seen. Dyspnea is a multidimensional experience of breathing discomfort.[1] Dyspnea is fourth most common symptom seen in cancer patients.[6] On functional activity breast cancer with dyspnea patients had general respiratory weakness, lower peak exercise capacity and peak ventilation and more shallow and rapid breathing pattern in response to activity. The purpose of this study was to find the impact of dyspnea on functional capacity in breast cancer patients.

Material and Methodology: In this cross sectional study,100 subjects were taken between the age of 30-65 years, subjects were taken according to MRC score. Thus tests such as 6MWT and 1MSTS were performed and cancer dyspnea scale was used to determine the impact.

Result: A total of 100 patients with dyspnea data were included. The study duration was of 6 months One minute sit to stand test results (n=100, p=0.005),6 minute walk test results (n=100, p=0.005), the main result was showed (n=100, p=0.0001) that was 43% subjects score positive and 57% subjects score negative impact on functional capacity.

Conclusion: By this study, it is concluded that there is very low negative impact of dsypnea on functional capacity in breast cancer patients.

Keywords: *Functional capacity, Dyspnea, Breast cancer.*

Introduction

Breast cancer in females stands most common cancer in India with rate of incidence as 25.8 per 1,00,000 females. In 2018,1,62,468 new cases were reported and 87,090 deaths were seen. The incidence of breast cancer in India is observed more in metropolitan cities. In India, breast cancer cases generally showed up or were diagnosed in advanced stages.

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In breast and lung cancer dyspnea is more commonly seen.

Dyspnea is a multidimensional experience of breathing discomfort .[1] Dyspnea is fourth most common symptom seen in cancer patients.[6]

Mechanism of Dyspnea in Cancer Patients: Cancer treatment causes an increase in brain serotonin level and upregulation of a population of 5-HT receptors leading to reduce somatomotor drive modified hypothalamic – pituitary adrenal axis function and sensation of reduced capacity to perform physical work[10].

Due to the normal level of hormone and protein which are connected to inflammatory process causes muscle fatigue that can decrease the ability to expand

the lungs, so the level of oxygen decreases and carbon dioxide increases and results in breathlessness.[5]The frequency of breathlessness increases rapidly with disease progression in patients with cancer.

The intensity of dyspnea and the occurrence of activity related dyspnea correlated with presence of anxiety, depression, fatigue and cough. A lower coping capacity was associated with a greater likelihood of dyspnea.

Dyspnea may vary person to person due to following factors:- Medical (site of cancer, pain and cough). Psychological (anxiety and depression). Social (education, marital status).[7]

Causes of dyspnea: Direct and indirect causes

Direct causes:-pleural effusion, pleural tumor, ascites, hepatomegaly, superior vena cava syndrome, lymphangitic carcinomatosis.

Indirect Causes: Cachexia, anemia, pneumonia, pulmonary aspiration, pulmonary emboli.[8]

Quality of life in cancer patients suffering from dyspnea have negative impact. Patients with dyspnea have difficulties in their daily living activities. Patients have bad impact on their functional, social and on mental health.[2]

On functional activity breast cancer with dyspnea patients had general respiratory weakness, lower peak exercise capacity and peak ventilation and more shallow and rapid breathing pattern in response to activity.

In cancer patients the 6MWT seems to be as valid and reliable as in healthy elderly, cardiac and pulmonary patients. Limitation was Small sample size. Short duration of study. Limited geographical area for study.

Methodology

A total number of 100 subjects who were willing to participate and fulfilled the inclusion and exclusion criteria were chosen. A written consent was obtained from the individuals. Subjects were taken according to MRC score and underwent to the test of 6MWT and 1 MSTS then after cancer dyspnea scale was used to determine the impact. Study duration was for 6 months.

Statistical Analysis and Results

Statistical analysis of the recorded data was done. Study design is cross sectional. Arithmetic mean and standard deviation was calculated for each outcome measure. T test was done. The study has p value <0.000 and was extremely significant.

MRC Score:

Table 1: This table shows grade wise MRC score in breast cancer patients.

MRC Score	
Grade 1	32%
Grade 2	30%
Grade 3	37%
Grade 4	1%

Table 2: This table shows how many time patient was able to performed sit to stand test in 1 minute.

Frequency of 1 minute sit to stand test	Patients
5-10	16
11-15	27
16-20	38
21-25	18

Group	P value
Group A-B	>0.05
Group A-C	>0.05
Group B-C	>0.05

6 Minute walk test:

Table 3: This table shows how many time patients were able to walk in 6 minutes.

6 Minute walk in meter	Patients
100-200	40
201-300	25
301-400	24
401-500	10

Group	P Value
Group A-B	>0.05
Group B-C	>0.05
Group C-D	>0.05

Group	Standard deviation	P Value
Group A	4.45	>0.05
Group B	4.45	>0.05
Group C	3.501	>0.05
Group D	1.021	<0.05

Table 4: This shows the impact of dyspnea on functional capacity in breast cancer patients.

Cancer Dyspnea Score	
Positive	43%
Negative	57%

Standard Deviation	P Value	T Value
4.475	<0.0001	40.969

Interpretation: The above graph shows that in 43% people score is positive & in 57% people the score is negative.

Discussion

Dyspnea is a multidimensional experience of breathing discomfort.[1] Dyspnea is fourth most common symptom seen in cancer patients.[6]

In the breast cancer patients peripheral fatigue which is muscle weakness occurs due to the chemotherapy, which can decrease the ability to expand the lungs, so the level of oxygen consumption decreases and carbon dioxide increases and thus results in breathlessness.[5]

The frequency of breathlessness increases rapidly with disease progression in patients with cancer. The Six minute walk test and one minute sit to stand test is reliable and valid as in healthy elderly and pulmonary patients.[9]

In cancer patients the cancer dyspnea scale is reliable in Marathi and Hindi. Multidimensional scales, which can be used to assess dyspnea in cancer patients. Aim of the study was to find the impact of dyspnea on functional capacity in breast cancer patients. To find the impact of dyspnea on functional capacity in breast cancer patients. To assess the severity of dyspnea in breast cancer patients.

The functional capacity was limited by other factors such as pain, anxiety. In other study which was conducted in all type of cancer in that the total number of patients were 923 and out of that 32.6% with breast cancer had breathlessness. This study has shown that dyspnea on functional capacity in breast cancer patients had negative (43%) impact on their daily living activities.

One patient was unable to perform the 6 minute walk test and 1 minute sit to stand test because of grade 4 dyspnea.

The study was done in six months of duration and was conducted in Karad. The total of breast cancer subjects with dyspnea were approached and then 100 subjects were selected on the basis of inclusion and exclusion criteria and consent was taken. Subjects were taken from Krishna hospital. Then subjects were explained about the procedure of study.

The impact on functional capacity was assessed using six minute walk test, one minute sit to stand test and cancer dyspnea scale.

According to Modified Medical research council dyspnea scale subjects are taken, then the subjects under went for six minute walk test and one minute sit to stand test then asked to marked the cancer dyspnea score.

The following interpretations were made:

- P value for group A 0.093, group B 0.079, group C 0.0122 was not significant.
- Pvalue for group A was 0.0335, group B 0.0389,group C 0.0979 was not significant
- The above graph shows that in 43% people score was positive & in 57% people the score was negative.

Conclusion

By this study, it is concluded that there is very low negative impact of dsypnea on functional capacity in breast cancer patients.

Conflict of Interest: The authors declare that there is no conflict of interest.

Ethical Clearance: An ethical clearance certificate was obtained from the Institutional Committee Krishna Institute of Medical Sciences Deemed to be University, Karad.

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