EFFECT OF HOME-BASED SHOULDER EXERCISE PROGRAM ON UPPER LIMB FUNCTIONS AND QUALITY OF LIFE FOLLOWING SURGERY IN WOMEN WITH BREAST CANCER.

Physiotherapy

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ABSTRACT

Due to advancements in the intervention of breast cancer among women such as the combined use of surgical intervention, Many Patients consequently experience debilitating effects, especially surgical side upper limb function impairments and QOL impairments. Home based exercise program and their effectiveness in context to Indian population is still questionable. 66 patients based on inclusion and exclusion criteria were selected from the HCG Cancer Centre Science City Road, Sola, Ahmedabad. Patients were equally divided into two groups based on randomization Group A (n=33) and Group B (n=33). Patients in Group A (Experimental Group) received intervention protocol and written prescription through Printed pamphlet along with usual care. Patients in Group B (Control Group) received usual care along with physiotherapy advice. Duration of treatment was 4 weeks. Outcome Measures were Shoulder Pain and Disability Index Scale and EORTC QOL –BR23. Both the groups showed improvement in upper limb functions and quality of life ($p < 0.05$). Between groups analysis showed that experimental group demonstrated statistically as well as clinically more significant improvement in upper limb functions and quality of life. Thus the study concluded that Home Based Exercises have a good efficacy and should be recommended during the immediate recovery period following surgery.

KEYWORDS

Breast cancer, Upper limb function, Home Based Exercises, Quality of life.

INTRODUCTION

As proven by WHO, one of the commonest cancers in women is breast cancer. [1][2] Due to advancements in the intervention of breast cancer, a significant proportion of women have experienced physical and psychological impairments after surgery.[3][4] In Indian population, many effective intervention programs have been used in Breast cancer care but there are no published accounts of the efficacy of a self administered, home-based program that is initiated immediately after surgery. Therefore, the primary objective of this study was to assess the efficacy of our home-based exercise (HBE) program and, on upper limb function and QOL after surgery.

Subjects And Methods:

Ethical approval was obtained from the Ashok & Rita Patel institute of physiotherapy (ARIP), Anand, Gujarat to publish the data and the results of this quality improvement project. We followed the DMAIC methodology to accomplish our main goal. (DMAIC is Determine the problem, Measure the baseline, Analyze the current situation, Implement the intervention and Check/control the improvement).

Study Participants

All Participants were chosen by convenient sampling, from HCG Cancer Centre, Science City Road, Sola, Ahmedabad. After getting consent, Patients included if they had undergone surgery for Stage II-III breast cancer with no Systemic complications and those who were ready to attend for immediate shoulder rehabilitation and follow-up. Patients were excluded with other malignant tumors, mastitis, active or other serious possible infections and also who had shoulder related Problem before surgery. According to Rule of thumb for sample size was calculated.[5]

Randomization And Allocation

Patients were selected for inclusion and exclusion criteria and were allotted by consecutive method into two groups, i.e. Home-based exercise Program group (Experimental group) and the usual care group (Control group).

Study Design

A total of 33 samples were received in each group out of 66 samples. And Demographics details & outcome measures for baseline data (SPADI) (QOL) were taken. In the experimental group, Each participant has guided intervention protocol and a written prescription through Printed pamphlet is given to them, i.e., they have been given all home-based shoulder exercises on Day 1 or Day 2 and after discharge, they are provided with a written prescription through a Printed pamphlet of all exercises with proper instructions, dosage and illustrative images to Experimental group. And they are instructed to maintain the protocol at home on their own for the next 4 weeks.

Usual care with physiotherapy advice is given to the Control group. Participants of the Experimental group are connected through supplemented calls, 5 days per week for four weeks and are motivated to do exercises and if they find any query it is solved. After two and four weeks, once again, both outcome measures were taken:–SPADI and EORTC QOL-BR 23. [6][7]

Interventions

Home-based exercise (HBE) group

Upper limb exercises and muscle relaxation training (phase I) with proper precautions will be given on post-op Day 1 or Day 2. Written prescription through a Printed pamphlet of all exercises with proper instructions, dosage, and illustrative images are provided after discharge. Progressive stretching exercises and muscle relaxation training (phase II) will be given on week 2 (After drains are removed). [8][9][10]

Supplemented Calls:

All the patients will be connected five days per week for four weeks. During the call they are guided and motivated well to do the exercise.

Usual Care (UC) Group

Usual care along with physiotherapy advice was given to the patients

on Day 1 at the hospital and was told to follow the advice. The advice for the usual care has been given according to the physiotherapist of HCG hospital (Data collection centre).

Statistical Procedures

To test the normality of the data Shapiro-Wilk test was used. While testing it is found that data was not normally distributed, which was reported in mean and standard deviation (SD). For Demographics, frequency distribution was done. The between-group analysis was evaluated by the Non-parametric test: Mann Whitney u and within-group analysis were assessed by Friedman test, for shoulder functions (SPADI), and quality of life (EORTC QOL BR 23). For all the statistical tests, a p-value < 0.05 was set. With the help of SPSS 23.0, statistical tests were performed.

RESULTS:

Demographics and Baseline characteristics

TABLE 1 shows a summary of the demographic details of the group. In this study 66 participants were taken part, in each group, 33 participants were randomly allocated. In the control group, the dropout rate was only 1. Overall, Baseline characteristics were almost similar in both the groups.

Table 1 Descriptive characteristics and baseline comparisons in the home-based exercise (HBE; n = 33) group and the usual care (UC; n=33)

VARIABLES		HBE	UC
Frequency (N)	Participants	33	34
	Dropouts	00	01
Age (Mean ±SD) years		43.03 ± 9.68	44.33 ± 8.25
No of Previous chemotherapy cycle (Mean ± SD)		4.27 ± 2.28	3.36 ± 1.78
Stage of cancer	Stage IIB	2	0
	Stage IIIA	9	15
	Stage IIIB	16	17
	Stage IIIC	6	1
Type of surgery	ALND	10	13
	MRM	23	20

Table 2 (A) (B) reports between-group analysis (Mann Whitney u test) of Pre and Post data of SPADI, QOL of both home-based exercise and usual care groups.

TABLE 2 (A) : Between Group Analysis – Upper limb functions

Outcome Measure	HBE Mean ± SD	UC Mean ±SD	Mean Diff	p-value
QOL (SYMPTOMS) PRE (DAY 1)	61.15± 10.59	59.53± 9.38	1.62	0.326
POST (WEEK 2)	32.75± 5.24	53.74± 4.07	20.99	0.000
POST (WEEK 4)	13.45±2.98	43.84± 6.88	30.39	
QOL(FUNCTIONAL) PRE (DAY 1)	52.2 ±7.08	52.52 ± 7.28	0.32	0.85
POST (WEEK 2)	52.0± 7.42	53.36±6.92	1.36	0.44
POST (WEEK 2)	52.0 ±7.42	53.36 ± 6.92	1.36	0.44

TABLE 2 (B): Between Group Analysis – Quality of life (Symptoms) (Functional)

Outcome Measure (SPADI)	HBE Mean± SD	(95% CI)		UC Mean ±SD	(95% CI)		Mean Diff	P-Value
		Lower	Upper		Lower	Upper		
Pre (Day 1)	67.69± 11.66	63.56	71.83	66.48 ± 10.70	62.69	70.27	1.21	0.768
Post (Week 2)	29.75± 2.97	28.70	30.81	56.48 ± 3.64	55.19	55.77	26.73	0.000
Post (Week 4)	5.66± 1.24	5.22	6.10	42.69± 3.28	41.53	43.86	37.03	0.000

Upper Limb Functions

Between-group analysis of Post data showed a mean difference of 37.03 [as shown in table 2(a)] and at the significance of $p < 0.05$. As MCID value of SPADI is a change of 13.2 points. Thus, the Upper limb functions in Home-based exercises group were much more than the usual care group. Therefore, this result of the between-group analysis of upper limb functions was clinically as well as statistically significant.

Quality of life (symptoms) component: (EORTC QOL BR-23)

Between-group analysis of Post data showed a mean difference of 30.39 at the significance of $p < 0.05$ [as shown in table 2(b)]. As MCID value of EORTC QOL BR-23 is a change of at least 5 points. Thus, the quality of life (symptoms) improvement in the home-based exercise group was clinically as well as statistically significant.

Table 3 reports the pre and post-analysis (Friedman's test) within-group analysis of SPADI and QOL (symptoms) (functional) of both Home-based exercise group and usual care groups.

Outcome Measures		Pre Mean ±SD	Post 2 Mean ±SD	Post 4 Mean ±SD	Mean Diff (pre & post 4)	p-value
SPADI	HBE	67.69± 11.66	29.75± 2.97	5.66± 1.24	62.03	0.000
	UC	66.48± 10.70	56.48 ± 3.64	42.69± 3.28	23.79	
QOL (Symptoms)	HBE	61.15± 10.59	32.75± 5.24	13.45± 2.98	47.7	0.810
	UC	59.53± 9.38	53.74± 4.07	43.84± 6.88	5.79	
QOL (Functional)	HBE	52.36 ±7.13	52.09 ± 7.42	52.51 ± 7.28	0.27	0.135
	UC	52.51± 7.28	53.36± 6.92	53.36 ± 6.92	0.85	

As a result of the home exercise program intervention, the HBE group demonstrated a significantly greater increase in upper limb functions and QOL (symptoms) component when compared to the UC. In the usual group, a significant result is seen because of the passage of time.

Thus Home-based exercise group is statistically as well as clinically more appropriate in the within-group analysis for both upper limb functions and QOL (symptoms) component.

However functional scores did not change over time for both the groups. Thus, the quality of life (functional) improvement in within groups was neither clinically nor statistically significant for any group.

DISCUSSION

In India, so many studies have been used on various shoulder rehabilitation on upper limb function but none of them is focused on home-based exercises program and nor during the immediate recovery period. So due to its effectiveness by Immediate onset (1 or 2-day post-surgery), 4 weeks of a self-administered, home-based exercise program with supplemented calls is the first study conducted in breast cancer patients after surgery.

This study verifies that the Home-based exercise program is statistically as well as clinically significant in both the outcome measures.

Limitation

It was a short duration study. As MCID value was not established in the Gujarati version, for both the scales, the English version of MCID value is used.

Future Recommendation

A longitudinal study with follow-up may give better implications of results. A tailor-made home exercise program can be assessed.

CONCLUSION

In our study, Home-based exercise (HBE) program with usual care along with supplemented calls for 4weeks of rehabilitation showed greater Upper limb Functional improvement, as well as good Quality of life (QOL) of symptoms component as compared to the usual care group. So this suggests that a Home-based exercise (HBE) program with usual care should be the best routine for increasing shoulder functions throughout the immediate 4-weeks of rehabilitation.

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