



EFFICACY OF PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION ON SHOULDER FUNCTION AND QUALITY OF LIFE IN POST OPERATIVE BREAST CANCER PATIENT.

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ABSTRACT

Background: The most common type of cancer among women worldwide and the main cause of mortality is breast cancer. Treatment options for breast cancer includes surgery, systemic therapy (chemotherapy, hormonal therapy) and radiotherapy. Breast cancer treatment has moved more and more toward conserving surgery over time. Mastectomy is the surgical removal of all or part of breast tissue, surrounding tissue and neighbouring lymphnodes. During a modified radical mastectomy, the entire breast and lymph nodes are removed. Modified radical mastectomy treatment may lessen functional handicap while causing adverse effect such as shoulder pain, decreased shoulder mobility and anatomical and biomechanical alterations to the shoulder. **Method:** 32 post operative breast cancer patients were included in this study. This study is conducted to improve shoulder mobility, decrease pain and improve quality of life of participants. Participants was given PNF (Proprioceptive Neuromuscular Facilitation) technique to improve condition of patient. Shoulder mobility, range of motion, SPADI (shoulder pain and disability index), quality of life were assessed pre and post treatment. **Result: Conclusion:** They current study concluded that PNF (Proprioceptive Neuromuscular Facilitation) technique proved beneficial and effective for patient with post operative breast cancer for shoulder dysfunction, pain, disability and quality of life.

KEYWORDS : PNF (Proprioceptive Neuromuscular Facilitation), Physiotherapy, POBC (post operative breast cancer), SPADI(shoulder pain and disability index), Quality of life.

INTRODUCTION

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body. A cancer that forms in the cells of breast mostly occurs in women's than men and the most common cause of death.

Women suffering from breast cancer constituted 25% of female patient who undergo Chemotherapy and Radiotherapy at Age of 50years. Treatment option in breast cancer includes Surgical treatment, Systemic treatment and Radiotherapy. Surgical treatment is the basic and indispensable procedure in the case of breast cancer. Early Consequences of surgical treatment are connected with immobilization and extensive post operative wound. They include respiratory disorders reduce the range of upper extremity and functional mobility due to post operative pain as well as reduce muscle power and strength.

Symptoms of breast cancer include a Lump in breast or underarm, swelling or thickening of part of breast, irritation or dimpling of breast, redness or flaky skin in nipple area, pulling in of nipple, pain in nipple, nipple retraction, nipple discharge (other than milk).

The cells in the breast grows out of control begin in different part of breast Lobules, Duct, Connective tissue. It can spread outside the breast through blood vessels and lymph vessels. Their types- are Invasive Duct Carcinoma and Invasive Lobular Carcinoma.

The various causes for breast cancer are Age, Sex, Family History and Genetics, Smoking, Alcohol, Obesity, Radiation exposure, HRT(hormonal replacement therapy).

The Investigation for breast cancer includes Mammogram, USG (ultrasound sonography), MRI(magnetic resonance imaging) thechnique, PET(positron emission tomography) scan etc.

The Surgical treatment of breast cancer includes Lumpectomy, Mastectomy, Sentinel Node Biopsy, Axillary Lymph Node Dissection, Radical Mastectomy.

Survival Rate of patient is about 90%.

PNF(Proprioceptive Neuromuscular Facilitation) is a stretching technique which is used to increase the flexibility and ROM(range of motion). It also helps to lengthen the muscle and increase neuromuscular efficiency. Its methods are 1) Contract-Relaxed, 2) Agonist-Contract, 3) Contract-Relaxed-Agonist-Contract. Patterns of PNF involves-1) Flexion, Extension, 2) Abduction, Adduction, 3) Internal, External Rotation. It is the exercise based on the principle of functional human anatomy and neurophysiology. The shoulder functioning is restricted after the operation of breast cancer. The Range of Motion flexibility, strength, functional mobility is reduced after surgery. The main goal of treatment is to facilitate the patient to achieve the correct movement or posture. It improves the ROM(range of motion), strength, functional mobility of shoulder. It may stimulate the activity of muscle spindle.

D1 D2 Pattern is useful for patient to improve range of motion

D1 Flexion:- Shoulder- flexion, adduction, external rotation and Forearm- supination and Wrist- radial flexion and Fingers- flexion.

D1 Extension:- shoulder- extension, abduction, internal Rotation and Forearm- pronation and Wrist- ulnar extension and Fingers- extension.

D2 Flexion:- Shoulder- flexion, abduction, external rotation and Forearm- supination and Wrist- radial flexion and Fingers- extension

D2 Extension:- Shoulder- extension, adduction, internal Rotation and Forearm-pronation and Wrist- radial flexion and Fingers- flexion.

This technique is very effective for post operative patients to improve functional ability of shoulder. PNF can boost the strength of muscle. The progressive stretch and change between contraction and relaxation can helps the muscles to adapt its neutral position or improve range of motion.

Physiotherapy in post operative period of breast cancer patient allows significant improvement in shoulder pain, disability, improvement in shoulder flexion, abduction and

external rotation [MC Nedy et al,2010]. Based on evidences shoulder pain and functional disability are the common problems associated with breast cancer surgery and it disrupts patients activities of daily living. The loss of breast produces soft tissue asymmetry and mass distribution throughout chest wall affecting the shoulder movement and resulting in shoulder dysfunction [NAQVI 2021]. The shoulder is very mobile joint that relies heavily on mid range stability on muscle controll therefore evaluation of such controll and treatment of its improvement should form a integral part of management of shoulder disorders [Magarey and Jones 2003]. Limitations in motion pain and tightness of tissues around shoulder including the skin, muscle and tendons caused by restricted movement are major dysfunctions that can lead to disability in ADL(activities of daily living) [Yang and Lin 2006].

MATERIALS AND METHOD

After approval from institutional protocall and ethical committee, this study was performed in a post operative breast cancer patients. The major goal of the study was to determine the efficacy of PNF(Proprioceptive Neuromuscular Facilitation) on shoulder function and quality of life in post operative breast cancer patients. 32 post ooperative breast cancer savours were selected for this study. According to inclusion criteria females dignosed with breast cancer post operative conditions only. Patients dignosed with other cancer types, dignosed with any respiratory conditions were excluded.

PROCEDURE

All the patients were approached and explained about the details related to the study and informed as well as verbal consent was taken from them. Pre-test assessment was taken by using SPADI (shoulder pain and disability index) to determine shoulder pain and functional disability and pre test assessment was taken by Goniometer to determine shoulder flexion, abduction and external rotation range of motion. Participants were given PNF(Proprioceptive Neuromuscular Facilitation) stretching pattern. The participants performed the exercises 3 times per week for 20-25 minutes for 4 weeks under the supervision of experienced person. Post test assessment was taken using SPADI (shoulder pain and disability index), Goniometer and Quality of life questionnaire. The interpretations of the study was done on the basis of comparing pre-test and post-test values by using Instat software.

OUTCOME MEASURES

1) SPADI (Shoulder Pain And Disability Index):-
The subjects were explained about SPADI. It is a self administered questionnaire that was found to be both sensitive and reliable. It contains 13 items which assess two domains (pain and disability). the subjects circled the best number that reflected their pain on scale 0 to 10, which has 5 subscales to measure pain. The subjects circled the best number that reflected their disability on scale from 0 to 10, which has 8 items subscale to evaluate the disability.

2)ROM (Range of Motion):-

Goniometer was utilized to assess flexion of the shoulder, abduction of shoulder and external rotation of shoulder. The patient was instructed to move the joint through its range of motion just after the Goniometer was adjusted to zero. Greater the value of range of motion more is the range of motion.

3)Quality of Life:-

Quality of life questionnaire that was found to be both sensitive and reliable was given to patients. 21 questions which assess the activities of daily living of participants. The subjects circled the best number that reflected their difficulties in ADL (activities bof daily living).

PNF (Proprioceptive Neuromuscular Facilitation) is stretching technique used to increase flexion and ROM (range of motion). PNF (Proprioceptive Neuromuscular Facilitation) pattern involves mainly 1) Flexion-Extension, 2)Adduction-Abduction, 3)Internal rotation-External rotation. The main goal of treatment is the patient to achieve functional mobility and strength of shoulder with improvement in quality of life. The exercise pattern of PNF (Proprioceptive Neuromuscular Facilitation) to participants was given as follows:-

D1 Flexion pattern starts in shoulder flexion,adduction and external rotation, forearm supination and wrist flexion and finger extension.

D1 Extension pattern starts in shoulder extension,abduction and internal rotation, forearm pronation and wrist ulnar extension and finger extension.

D2 Flexion pattern starts in shoulder flexion,abduction and external rotation, forearm supination and wrist radial flexion and fingers extensionin.

D2 Extension pattern starts in shoulder extension,adduction and internal rotation, forearm pronation and wrist ulnar extension and fingers flexion.

RESULT

The patient who finished a complete session, for them analysis was made and complete pre and post assessment were performed.

pain	pre	post	P value
	81.35±5.6	76.116±5.89	Extremely significant

In table number 1, the pain intensity significantly decreased in participants. Post treatment mean using pain scale was pre (81.35 ± 5.6) and post (76.116 ± 5.89). However it shows P value is extremely significant (p<0.0001).

Functional disability	pre	post	P value
	78.535 ± 5.561	69.326 ± 5.231	Extremely significant

In table number 2, the functional disability score showed a significant decrease in group of participants. Post treatment indicate decrease in functional disability it is pre (78.535 ± 5.561) and post (69.326 ± 5.231). However it shows P value is extremely significant (p<0.0001).

flexion	pre	post	pvalue
	93.156 ± 16.6	115.78 ± 13	Extremely significant

In table number 3, the flexion range of motion is increased in group of participants post treatment. The mean increase in flexion pre test (93.156 ± 16.6) and post (115.78 ± 13). However it shows P value is extremely significant (p<0.0001).

extension	Pre	post	P value
	22.593 ± 6.148	35.62 ± 5.64	extremely significant

In table number 4, the extension range of motion is increased in group of participants post treatment. The mean in extension pre test (22.593 ± 6.148) and post test (35.62 ± 5.64). However it shows P value is extremely significant (p<0.0001).

Adduction	pre	Post	P value
	25.062 ± 5.08	34.687 ± 5.40	extremely significant

In table number 5, the adduction range of motion is increased in group of participants post treatment. The mean in adduction pre test (25.062 ± 5.08) and post test (34.687 ± 5.40). However it shows P value is extremely significant (p<0.0001).

Abduction	Pre	Post	P value
	95.281 ± 14.97	117 ± 14.137	extremely significant

In table number 6, the abduction range of motion is increased in group of participants post treatment. The mean in

abduction pre test (95.281 ± 14.97) and post test (117 ± 14.137). However it shows P value is extremely significant (p<0.0001).

QOL	Pre	Post	P value
	95.136 ± 8.32	70.198 ± 13.532	extremely significant

In table number 7, the quality of life questionnaire, the group of participants improved the functional ability and ADL (activities of daily living) after treatment. The standardised questionnaire was given to participants and asked to fill pre and post treatment. The quality of life pre treatment (95.136 ± 8.32) and post treatment (70.198 ± 13.532).However it shows P value is extremely significant (p<0.0001). The participants feel less difficulties in ADL (activities of daily living), the shoulder mobility, functional ability were improved post treatment.

DISCUSSION

The study "Efficacy of Proprioceptive Neuromuscular Facilitation on shoulder function and quality of life in post operative breast cancer patient" was conducted to determine the effect of Proprioceptive Neuromuscular Facilitation stretching exercise programe on post operative breast cancer patient. Females who had breast cancer surgeries had slightly increased prevalence of shoulder dysfunction such as shoulder pain, functional disability and decrease in range of motion (Ewertz and Jensen 2011) .the effect of surgery resulted in shortning of shortning of soft tissues such as pectoral muscle which results in shoulder pain and restriction of shoulder upward motion, abduction and external rotation of shoulder (Loh and Musa 2015). Post-operative patients, scapular and shoulder kinematics are frequently altered, causing them to struggle with activity of daily living leading to shoulder stiffness and pain. (Rett et al., 2017).Physiotherapy in the post-operative period of surgery allowed significant improvement in shoulder range of motion, decrease in pain and improve in functional disability and also plays an important role in the prevention, early detection and treatment of complications in the postoperative period of breast cancer (De Greof et al., 2015).

The present study included 32 participants. They were selected as per inclusion criteria then they were informed with the complete procedure of study. The participants consent should be taken prior assesment the exercise should performed under the supervision of expert the treatment protocol is started with the pre test assesment of range of motion with goniometer ,shoulder pain and disability index and quality of life questionnaire after that exercise should performed 3 times in week for 20-25 mins for 4 weeks. Then after completion of exercise protocol post test assesment should taken. The result is shown in improvement of functional activity,shoulder mobility .

According to this study, Proprioceptive Neuromuscular Facilitation stretching exercise programe should given to participants can reduce shoulder pain, improve shoulder range of motion, and also reduce disability ,difficulties in activities of daily living it lead to improvement in shoulder joint function.

Hence, this study showed significant effect of Proprioceptive Neuromuscular Facilitation stretching exercises for pain, functional disability, and shoulder flexion, abduction and external rotation range of motion in post operative patients.

CONCLUSION

The current study concluded that, Proprioceptive Neuromuscular Facilitation stretching exercises to post operative breast cancer patient proved beneficial and effective on shoulder dysfunction for pain and functional

disability and quality of life after surgery.

Conflict Of Interest- No conflicts of interest

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