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Effectiveness of early supervised physiotherapy in prevention of lymphoedema after modified radical mastectomy

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Abstract
Objective: To determine the effectiveness of early supervised physiotherapy in reducing the risk of lymphedema after modified radical mastectomy.
Design: Experimental Study.
Setting: Data was collected from in patient department of Surgery department, K.J Somaiya Hospital, Sion, Mumbai.
Method: The study included 20 participants and divided into two groups with 10 participants in each. They were treated with a physiotherapy program including positioning, active range of motion, progressive resisted exercises, manual lymphatic drainage technique, compression garment and deep breathing exercises. All the exercises were supervised by therapist. Group A also received an educational strategy. The control group received the educational strategy only. Main outcome measure was lymphedema (>2 cm) increase in arm circumference measured at two adjacent points compared with the non-affected arm using measuring tape.
Result: Comparison of post treatment circumferential measurement of group A and group B at three level, post group A value for mid-arm was 19.11cm and post group B was 21.55cm respectively using unpaired t test p=0.058 not significant. At elbow, post group A value was 15.44cm and post group B value was 18.08cm respectively using unpaired t test p=0.032 significant, and at midforearm post group A value was 12.25cm and post group B value was 15.02cm respectively using unpaired t test p=0.046 significant**.**
Conclusion: Early supervised physiotherapy could be an effective intervention in prevention of lymphedema in women for at least 3 months after surgery for breast cancer involving dissection of axillary lymph nodes. Trial registration- PIMS/PMT/IEC/2016/16390

Keywords: Lymphedema, modified radical mastectomy, prevention, cancer

1. Introduction
Among various diseases, cancer has become a big threat to human beings globally. As per Indian population census data, the rate of mortality due to cancer in India was high and alarming which are about 8.06 lac existing cases by the end of the last century. Cancer is the second most common disease in India responsible for maximum mortality with about 0.3 million deaths per year [1]. Breast cancer is the most common female cancer in the world with an estimated 1.67 million new cancer cases. An annual incidence of approximately 1.44 thousand new cases of breast cancers in India While the age adjusted incidence rates of breast cancer in India is lower than the western countries, because of the large population the burden of breast cancer is high With an annual incidence of approximately 1.44 thousand new cases of breast cancers in India, it has now become the most common female cancer in urban India [2]. There are two main types of breast cancer are Ductal carcinoma starts in the tubes (ducts) that move milk from the breast to the nipple and it is the most common type of breast cancers and Lobular carcinoma which starts in the parts of the breast, called lobules, which produce milk [3]. Most breast cancers are carcinomas, a type of cancer that starts in the epithelial cells that line organs and tissues like the breast. Breast cancers are often a type of carcinoma called adenocarcinoma, which starts in glandular tissue. Other types of cancers can occur such as sarcomas. Ductal carcinoma in situ (DCIS; also known as intraductal carcinoma) is considered noninvasive or pre-invasive breast cancer. This is the most common type of breast cancer.

Invasive ductal carcinoma (IDC) starts in a milk duct of the breast, breaks through the wall of the duct, and grows into the fatty tissue of the breast. At this point, it may be able to spread (metastasize) to other parts of the body through the lymphatic system and bloodstream. Invasive lobular carcinoma starts in the milk-producing glands (lobules). Like IDC, it can spread (metastasize) to other parts of the body. Less common type of breast cancer is inflammatory breast cancer. Usually there is no single lump or tumor. Instead, inflammatory Breast Cancer makes the skin on the breast look red and feels warm. It also may give the breast skin a thick, pitted appearance that looks a lot like an orange peel. The affected breast may become larger or firmer, tender or itchy. In its early stages, inflammatory breast cancer is often mistaken for an infection in the breast called mastitis. Paget disease of the nipple is type of breast cancer starts in the breast ducts and spreads to the skin of the nipple and then to the areola, the dark circle around the nipple. The skin of the nipple and areola often appears crusted, scaly and red with areas of bleeding. The woman may notice burning or itching sensation. Phyllodes tumor is very rare breast tumor, these tumors are usually benign but on rare occasions may be malignant. Angiosarcoma is form of cancer starts in cells that line blood vessels and it rarely occurs in the breasts. Treatment is generally the same as for other sarcomas. There are some special types of breast cancer that are sub-types of invasive carcinoma. Adenoid cystic carcinoma, Low-grade adenosquamous carcinoma, medullary carcinoma, Mucinous carcinoma, papillary carcinoma, Tubular carcinoma. These include: Metaplastic carcinoma, Micropapillary carcinoma, mixed carcinoma [4]. factors that have been shown to increase a woman's risk of developing breast cancer are women over the age of 50, personal or family history of breast cancer, previously suffered with benign breast cancer, late first pregnancy after the age of 35, use of hormone replacement therapy after the menopause, being overweight or obese after the menopause, physical inactivity, a high fat diet and high alcohol consumption [5]. Symptoms of breast cancer may include- lump in breast or lump in the armpit that is hard, has uneven edges, and usually does not hurt, Change in the size, shape, or feel of the breast or nipple. Fluid coming from the nipple- may be bloody, clear to yellow, green, and look like pus [6].

The diagnosis is based on clinical, radiological and pathological examinations. Clinical examination includes bimanual palpation of the breasts and locoregional lymph nodes. Mammography, ultrasound, MRI of the breast [7]. Core needle biopsy obtained by manual or preferably by ultrasonic stereotactic guidance [8]. Final pathological diagnosis should be made according to the World Health Organization (WHO) classification [9].

Some of the most common types of surgery include breast conserving surgery or lumpectomy which involves the removal of the cancerous area, the surrounding tissue and in some cases the lymph node, whist aiming to maintain a normal breast appearance after surgery. Partial mastectomy is where a larger portion of tissue is removed [10]. Modified radical mastectomy is the most common surgery. It is a procedure in which the entire breast is removed, including the skin, areola, nipple and most axillary lymph nodes; the pectoralis major muscle is spared [11].

The complications of modified radical mastectomy include lymphedema which is the most common complication, pain or tenderness, swelling at the surgery site, buildup of blood in the wound (hematoma), buildup of clear fluid in the wound (seroma), limited arm or shoulder movement, numbness in the chest or upper arm, nerve pain in the chest wall, armpit, and/or arm and hand [12].

Lymphedema is a condition that results from impaired flow of the lymphatic system. Symptoms of lymphedema include swelling in one or more extremities. Primary lymphedema is present at birth; secondary lymphedema develops as a result of damage to or dysfunction of the lymphatic system. Cancer treatment is the most common cause of lymphedema. While there is no cure for lymphedema, compression treatments and physical therapy may help reduce the swelling and discomfort [13].

The signs of lymphedema may include: Heavy feeling in the arm, tight feeling in the skin of the arm, less movement in hand, wrist, And trouble fitting into cloth's, ring, watch, feel tight but you have not gained weight. But if the problem continues, the limb may become hot and red and the skin hard and stiff. There are treatments to reduce the swelling, prevent it from getting worse, and decrease the risk of infection. This treatment is called Complex decongestive physiotherapy (CDPT) is recommended by most lymphedema therapists. It involves several weeks of skin and nail care, manual lymphedema therapy is massage to move fluid from the swollen area into an area where the lymphatic system is working normally. MLD is given for about 20 minutes with light pressure. Therapeutic exercises in which shoulder, elbow and wrist range of motion exercises are given. Compression wrapping which gives pressure on hand and arm which help in reducing swelling and pain. Wearing of compression garments reduces swelling and discomfort, followed by a long-term maintenance program.[14]

2. Methodology- The study received the ethical approval from Institutional Ethical Committee Ref No. PIMS/PMT/IEC/2016/16390 of Dr. A. P. J. Abdul Kalam College of Physiotherapy, Loni.

The participants were screened and after finding suitability according to the inclusion and exclusion criteria, they were requested to participate in the study. They were explained about the study and the intervention. The participants were briefed about the nature of the study, the duration of intervention and the intervention being used was explained in the language best understood by the participants. They were encouraged to clarify queries regarding the study, if any. An informed written consent form, previously approved by ethical committee was then obtained from all participants. The demographic data was obtained and a detailed assessment, circumferential girth measurement was done. Participants were randomized and divided into two groups, Group A (Early supervised Physiotherapy) and Group B (Educational Group). Circumferential girth measurement was done on affected and unaffected upper-limb of all the participants. Girth measurement was done at three levels; mid arm, elbow and mid forearm. Taking the reference point of olecranon process measurement was done. This study was a pre-post-intervention study in which measurements were taken before and after the 3-months exercise program. One participant from Group A, was excluded from the study due the hemodynamic unstability during intervention and three participants from Group B refused to participate in the study due to long follow-up of the study. Breast cancer patients who had undergone

mastectomy and had completed chemotherapy and radiation therapy were referred to the study by the oncology surgeon. Group A received the early supervised physiotherapy treatment; Group B received the educational strategy.

The group A received following intervention:

- Active range of motion exercises of shoulder flexors, extensor, abductors, adductors, Elbow flexors, extensors, Wrist flexors and extensors, radial and ulnar deviators for 10 repetitions.
- The Active range of motion exercises were progressed to Progressive resistance exercises using dumbbells with 7-10 repetition.
- Manual lymphedema therapy given to move fluid from the swollen area into an area where the lymphatic system is working normally and it is given for about 20 minutes with light pressure.
- Compression wrapping given during exercises and for night wear to reduce swelling and pain.
- Deep breathing exercises are given after every exercises session as it promotes relaxation.
- Elevated arm position in sitting, side-lying and supine using pillows above heart level, it helps in reduction of swelling and discomfort.

For group A exercises were given in OPD for 6 days a week for 3 months. And group B was educational group so all the exercises were performed at home and asked them to come for follow up.

3. Data analysis and results

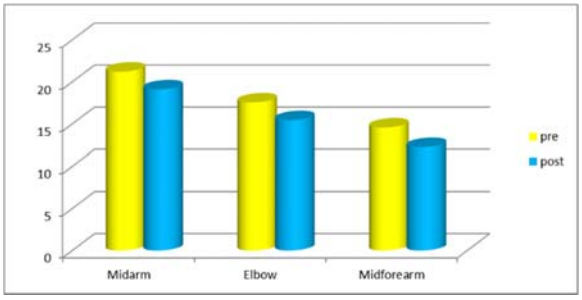

Fig 1: Circumferential measurement of group A at three levels.

Result 1-The above graph shows the comparison of circumferential measurement at three levels, pre value for mid arm was 21.22 and post value was 19.11 respectively. At elbow, pre value was 17.55 and post value was 15.44 respectively, and at midforearm pre value was 14.57 and post value was 12.25 respectively. Using paired t test, within the group p<0.0001, extremely significant.

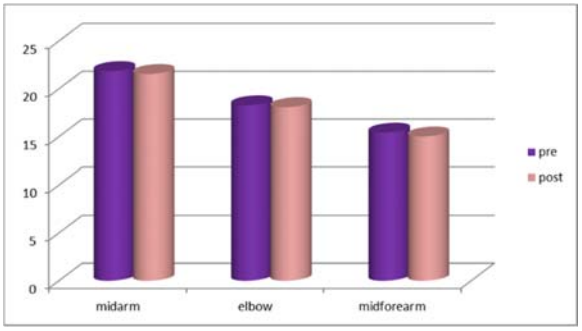

Fig 2: Circumferential measurement of group B at three levels.

Result 2-The above graph shows the comparison of circumferential measurement at three level, pre value for mid arm was 21.85 and post value was 21.55 respectively using paired t test p=0.32 not significant. At elbow, pre value was 18.28 and post value was 18.8 respectively using paired t test p=0.44, and at midforearm pre value was 15.42 and post value was 15.2 respectively using paired t test, within the group p=0.27 not significant.

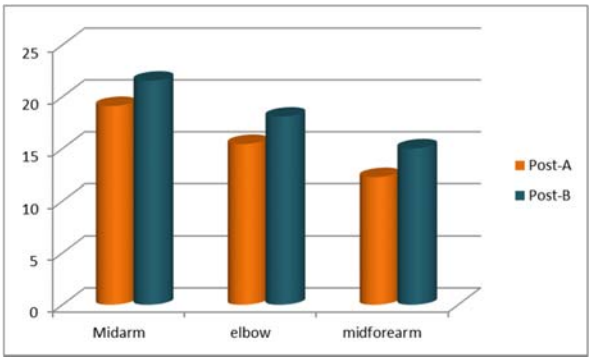

Fig 3: Post treatment circumferential measurement of Group A and Group B

Result 3-Comparison of post treatment circumferential measurement of group A and group B at three level, post group A value for mid arm was 19.11cm and post group B was 21.55cm respectively using unpaired t test p=0.058 not significant. At elbow, post group A value was 15.44cm and post group B value was 18.08cm respectively using unpaired t test p=0.032 significant, and at midforearm post group A value was 12.25cm and post group B value was 15.02cm respectively using unpaired t test p=0.046 significant**.**

4. Discussion: The study evaluated effectiveness of early supervised physiotherapy in prevention of lymphedema after modified radical mastectomy with sample size of 20 females, age group of 40-60 with axillary lymph node dissection are divided in two groups. Group A is early physiotherapy group and group B educational group. both the groups received active range of motion exercises of shoulder flexors extensors abductors adductors, Elbow flexors extensors, wrist flexors extensors and radial and ulnar deviators. Progressive resistance exercises using dumbells, manual lymphatic drainage technique for 20 minutes, compression wrapping, deep breathing exercises, upper limb positioning for 3 months. The results of study showed that the exercise program led to statistically significant reductions in the circumference of the affected upper limb in early supervised physiotherapy group than educational group because in group A, there was supervised treatment for the participants by the therapist and for group B there was only home exercises given by therapist. In home exercise program there was irregularity in performing exercises and motivation was also less. Therefore Group B participants did not show much improvement.

In the present study, in Group A circumferential measurement at three level in, pre value for mid arm was 21.22cm and post value was 19.1 1cm respectively. At elbow, pre value was 17.55cm and post value was 15.44cm respectively, and at midforearm pre value was 14.57cm and post value was 12.25cm respectively. Using student paired 't' test, p<0.0001, extremely significant.

In group B, comparison of circumferential measurement at three level, pre value for mid arm was 21.85cm and post value was 21.55cm respectively using student paired 't' test p=0.32 not significant. At elbow, pre value was 18.28 cm and post value was 18.8 cm respectively using student paired 't' test p=0.44, and at midforearm pre value was 15.42cm and post value was 15.2cm respectively using paired t test, within the group p=0.27 not significant.
Comparison of post treatment circumferential measurement of group A and group B at three level, pre value for mid arm was 19.11cm and post value was 21.55cm respectively using unpaired t test p=0.058 not significant. At elbow, pre value was 15.44cm and post value was 18.08 respectively using student unpaired 't' test p=0.032 significant, and at midforearm pre value was 12.25cm and post value was 15.02cm respectively using student unpaired 't' test p=0.046 significant**.**

5. Conclusion: The study concluded that prevention of lymphedema after modified radical mastectomy was more effective in early supervised physiotherapy group than educational group. As it improves affected upper-limb symptoms and led to improved QOL of breast cancer patients. Hence, supervised exercise program considered to be effective than home exercises for improving the secondary lymphedema and associated symptoms resulting from breast cancer treatments.

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7. References

1. Ali I, Waseem Wani A, Kishwar S. Cancer Scenario in India with Future Perspective, Cancer Therapy, 2011; 8:56-70.
2. Swaminathan S. Consensus document for management of breast cancer, ICMR, 2016.
3. www.uarc.com, a.d.a.m., last accessed on 2017 February.
4. www.cancer.org, last accessed on 2017 February.
5. www.cdc.gov last accessed on 2017.
6. breast cancer diagnosis, www.burkespharmacy.com Accessed on 2017 Feb.
7. Aebi S, Davidson T, Gruber G, Cardoso F. Primary breast cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up; Annals of Oncology, 2011; 22(6):vi12–vi24. doi:10.1093/annonc/mdr371
8. Luis A, Luis J. Ultrasound-guided core-needle biopsy of breast lesions, NCBI, 2011; 2(4). doi- 10.1007/s13244-011-0090-7.
9. Kataja V, Castiglione M. Primary breast cancer: ESMO Clinical Recommendations for diagnosis, treatment and follow-up, Ann Oncol. 2009; 20(4):iv10-iv14. DOI:https://doi.org/10.1093/annonc/mdp114, may 2009
10. American cancer society, national cancer database breast cancer risk. Http://www.cancer.org/cancer/breastcancer/detailedguide/breast-cancer-key-statistics last accessed on 2017 feb
11. Surgical Procedures: Modified Radical Mastectomy. www.oncolink.org last accessed on 2017 Feb.
12. Johns Hopkins medicine, www.hopkinsmedicine.org last accessed on Feb 2017.
13. Www.Medicinenet.Com Last Accessed On 2017
14. www.cancer.org, Page 1-6, Last Accessed On Feb 2017