

EFFECT OF VODDERS TECHNIQUE IN UNILATERAL MASTECTOMY SUBJECTS

¹Dr.G.sperjan, ²Dr.E.shanmuganath

¹M.P.T (cardiorespiratory) 2nd year, ²Associate professor

Department of cardiorespiratory Physiotherapy

Saveetha College of Physiotherapy, Saveetha University, Chennai, India.

Abstract: Subjects with unilateral mastectomy who fulfilled the selection criteria were recruited in the study. This study include Unilateral mastectomy subjects with lymphedema after 1 year of surgery , SLND (sentinel lymph node dissection) and ANND (axillary lymph node dissection), Lymphedema with stage- 0 and I Age group of woman 25 to 55 this study excluded subjects with bilateral mastectomy Lymphedema with stage – II and III Patients with hand fibrosis or finger contracture, ongoing infections and thrombosis contralateral breast diseases, intercurrent diseases affecting swollen arm, upper extremities contracture or deformities participant who were not coperated. A total of 30 subjects were recruited and divided into 2 groups through odd And even method. The limb volume and breathlessness was assessed before and after the end of the treatment by using water displacement method and borg scale respectively. Group A received the vodders technique along with compression bandage and group B received only the compression bandage as a part of conventional therapy. Treatment duration for each participant was 30 minutes, 1 session per day, 5 days per week for 2 weeks. **STATISTICAL ANALYSIS:** The data was collected and tabulated. Paired t-test was used to compare the results within the group and independent t- test was used to compare the results between the groups. **RESULTS:** The paired t- test analysis showed statistically significant difference (<0.0001) between the pre and post-test values of group A and group B whereas the independent t- tests analysis showed a significant difference (<0.0001) between the post-test values of group A and group B. **CONCLUSION:** The study result showed that vodders technique along with compression bandage is effective than by giving compression bandage in alone reduction of limb volume and breathlessness in subjects with unilateral mastectomy.

Keywords: vodders technique, compression bandaging, Water displacement method, unilateral mastectomy, (CDT), complete decongestive therapy.

INTRODUCTION

WHO state that Breast cancer is most frequent of cancer among women, impacting over 1.5 million women each year, and also causes the greatest number of cancer-related deaths among women. In 2015, 570,000 women died from breast cancer – that is approximately 15% of all cancer deaths among women. While breast cancer rates are higher among women in more developed regions, rates are increasing in nearly every region globally [1]. Breast cancer that develops from breast tissue. Signs of breast cancer may include a lump in the breast, a change in breast shape, dimpling of the skin, and fluid coming from the nipple, or a red or scaly patch of skin. In those with distant spread of the disease, there may be bone pain, swollen lymph nodes, shortness of breath, or yellow skin [2].

Risk factors for developing breast cancer include obesity, lack of physical exercise, drinking alcohol, hormone replacement therapy during menopause, ionizing radiation, and early age at first menstruation, having children late or not at all, older age, prior history of breast cancer, and family history. The overall incidence of lymphedema in breast cancer is 6.8 percent, which is relatively low, compared with studies based on the breast cancer survivor population, which show rates ranging from 13 to 65 percent. The drainage and filtering system of the body is made up of lymph nodes (also called lymph glands), vessels and fluid. It helps to get rid of waste products and fight infection. During breast cancer surgery (mastectomy or lumpectomy), some of the lymph nodes in the underarm (called axillary lymph nodes) may be removed. They are checked to see if they contain cancer cells. When axillary lymph nodes are removed during breast surgery (with sentinel node biopsy or axillary dissection) or are treated with radiation therapy, some of the lymph vessels can become blocked. This may prevent lymph fluid from leaving the area [3, 4, 5].

The lymphatic vessels transport a straw-coloured fluid called lymph, which flows very slowly but continuously through the lymph vessels to the lymph nodes where it is filtered. Lymph is made up of water and protein and also contains white blood cells called lymphocytes, which help your body fight infection. The lymph nodes help fight infection by filtering out waste products like bacteria. They can also filter out cancer cells that have spread from a breast cancer, destroying some of them in the process [6]. Lymphedema is defined as the abnormal accumulation of protein-rich fluid in extracellular spaces, caused by decreased lymphatic transport capacity and an increased lymphatic load. Lymphedema happens when lymph fluid builds up in the hand, arm, breast, chest wall or under the arm on the side where you have cancer, resulting in swelling and other possible symptoms. Lymphedema can occur any time after treatment even many years later. As fluid builds up and the area swells, it can cause pain, reduced movement, serious infections, and emotional upset and reduced quality of life [7, 8].

Therefore it can lead to pain and a sensation of heaviness in the affected area which can lead to breathlessness due to poor chest expansion these symptoms can affect impaired lymph drainage and can result in difficulty in breathing, decreased functional ability, diminished joint movements and chest expansion. At one time people believed little could be done for lymphedema, but we now know that is untrue [9].

The movement of fluid in the lymphatic system is governed by osmotic and hydrostatic pressure gradients, according to Starling's Law of Capillaries, forcing fluids to flow from high pressure areas to low pressure areas essentially; arterial pressure is greater

than the pressure in the interstitial space, which causes water to push into the interstitium on arterial ends of capillary beds. However, the opposite is the case at the venous end of capillary beds, where interstitial pressure is greater than the intracapillary pressure, and 80-90% of fluid is reabsorbed into the capillary. The basement membrane of the capillaries is semi-permeable, which allows about 50% of the circulating plasma to enter into the interstitium every day there are several treatments to help manage and lessen the condition. Under normal circumstances, slightly more fluid gets filtered out of the capillaries and into the interstitial space than gets reabsorbed from the interstitial fluid back into the plasma^[10].

When interstitial pressure is greater than intralymphatic pressure, water and proteins flow into the lymphatic system, producing lymph. In a healthy individual, lymph will move centrally in a number of different ways. Firstly, the contraction and relaxation of skeletal muscles allow for alternate compression and decompression of the lymphatic vessels. This allows for the lymph to flow centrally through the unidirectional valves. Secondly, a respiratory pump assists in moving fluid through the chest by way of alternating pressures. Thirdly, the pulsating aorta assists with movement of lymph through the lymphatic duct due to their close proximity to each other. Fourthly, the smooth muscle within the lymphangion's spontaneously contracts, propelling the lymph centrally^[11].

The gold standard approach is for a trained lymphedema therapist to give complete decongestive therapy (CDT), which includes specialized gentle massage, wrapping with compression bandages, skin care and lymphatic exercises. The treatment takes time, sometimes daily medical office visits for several weeks. In this exploratory study, this is The precursor of a full study on a series of patients, three cases of chronic lymphatic drainage insufficiency was treated with the Dr. Vodders method of manual lymph drainage (MLD). The aim of this study is to objectively determine the impact of the MLD session on compositional changes including limb hardness, fluid distribution, circumference and volumes. This level of objectification is essential if we are to determine the real effect of these very important treatments and to enable health practitioners and subject alike to better know what to expect after a treatment session. Of course more marked results could reasonably be expected following a series of treatments in this reduction of limb volume may reduce the breathlessness of the patient^[12].

The Dr. Vodders Method works with circular movements or continuous spiral-type strokes, increasing pressure to 30 torr (or roughly 4 kilopascal's) and then reducing the stroke pressure to zero. This constant change in pressure generates the pumping effect. Pressure is increased towards the natural direction of lymph flow. The decongestive benefits of MLD are well known, and are achieved in various ways. On the one hand MLD stimulates the Lymphangiomotor system and, in so doing, drains the affected tissue of excess water and protein that would need to be eliminated via the lymphatic system.

When swelling is under control, the therapist may switch you from bandages to elastic compression garments, such as a sleeve, hand gauntlet or chest garment. This is worn during the day and bandaging or a compression garment is worn at night. Therapist can help you get fitted correctly. Manual lymph drainage involves light, gentle strokes in order to improve circulation of the lymphatic system^[13].

This improved circulation is important to remove fluid from the interstitial place by improving reabsorption. After lymphatic massage, the therapist may wrap the area in multiple layers of padding and "short-stretch" compression bandages¹⁷. These woven bandages look somewhat like ACE bandages but stretch much less, which is very important for treating lymphedema^[14, 15, 16].

Compression bandaging helps to passively encourage circulation and filtration of the lymphatic system when used in conjunction with elevation. Finally circulation of the lymphatic system, helping to return the limb to a normal size. The technique stimulates lymphatic system circulation, increases lymph vessel suction by inducing a pumping effect, mobilizes edema, and removes the excess interstitial fluid. Compression bandaging treatment was accomplished with low stretch bandages to ensure continuous pressure during work as well as during rest periods^[18, 19, 20].

II. NEED OF THE STUDY

To determine the effectiveness of vodders technique with compression bandaging on breathlessness and limb volume among lymphedema with unilateral mastectomy subjects.

III. METHODOLOGY

Thirty subjects were recruited from oncology Department of Saveetha Medical College inpatient ward, and Hospital, Saveetha University, Thandalam, Chennai. The subjects were randomized into two groups by odd or even method into Group-A and Group-B. The total of 30 patients was given an odd or even numbers. The even numbers are assigned into Group-A and an odd numbers are assigned into Group-B. The subjects those who fulfill the inclusion and exclusion criteria were participated in the study. Such eligible subjects were selected in the study after obtaining informed consent.

2.1 Inclusion criteria with Unilateral mastectomy after 1 year of surgery , SLND (sentinel lymph node dissection) and ANND (axillary lymph node dissection) ,Lymphedema with stage- 0 and I ,Age group of woman 25 to 55.

2.2 Exclusion criteria with Bilateral mastectomy ,Lymphedema with stage – II and III ,Patients with hand fibrosis or finger contracture were excluded from the study ,ongoing infections and thrombosis ,contralateral breast diseases ,intercurrent diseases affecting swollen arm , upper extremities contracture or deformities ,participant who were not cooperated were be excluded from the study.

2.3 Procedure: 30 individuals were selected based on selection criteria. They were explained about the procedure and informed consent was obtained from all the participants. Participants were allocated by odd or even method into two

groups. Subjects in Group A were given voddors technique with compression bandage. Subjects in Group B were given compression bandage. Both the groups received compression bandage as a part of conventional treatment for lymphedema. The period of intervention for each participant was 30 minutes, 1 session per day, 5 days per week for 2 weeks.

2.4 Treatment protocol

2.4.1 Group-A received voddors technique along with compression bandage for 45 minutes, 1 session per day, 5 days per week for 2 weeks.

2.4.2 Group-B received compression bandage alone for for 24 hours, 1 session per day, and 5 days per week for 2 weeks.

2.5 Outcome Measures: The limb volume is assessed by water displacement method and breathlessness is assessed by borg scale.

IV. STATISTICAL ANALYSIS:

The data was calculated and tabulated. Paired t-test was used to analyses the result within the group and unpaired t-test was used to analyses the result between the groups.

V. RESULTS: In Group-A Pre-test and Post-test values of water displacement for limb volume and borg scale for breathlessness in unilateral mastectomy revealed that for Water Displacement Pre-Test mean value = 13066.67, SD=1579.63 Post-test mean=5666.67,SD=1234.43, t-test value=22.0742 and $p < 0.0001$, for Borg Pre-test mean value=13.40,SD=1.64, Post-test mean=7.47, SD=1.19, t-test value= 23.9085 and $p < 0.0001$ is extremely statistically significant.

In Group-B Pre-test and Post-test values of water displacement for limb volume and borg scale for breathlessness in unilateral mastectomy revealed that for WD Pre-Test mean value = 13800, SD=1740.28 Post-test mean= 11188,SD=1590.15, t-test value=2.4757 and $p < 0.0196$, for Borg Pre-test mean value=12.93,SD=1.91, Post-test mean=11.13, SD=2.0, t-test value= 2.5208 and $p < 0.0177$ is statistically significant. Hence it is statistically significant.

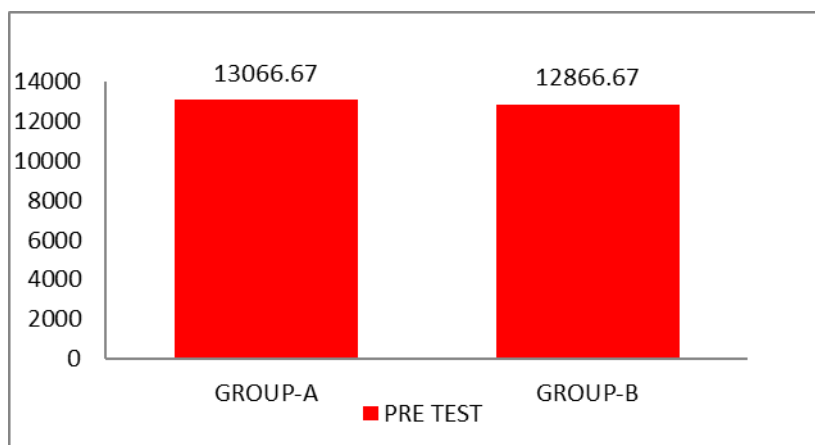
The Independent t-test values of Water Displacement and Borg scale between Group-A and Group-B; For Water Displacement Group-A mean value is= 5666.67, SD= 1234.43 and Group-B mean value is= 11188, SD= 1590.15, t-value between Group A and Group B is= 6.0909 and $p < 0.0001$ and for Borg Scale Group-A mean value is= 7.4700, SD= 1.1900 and Group-B mean value Is= 11.1300, SD= 2.00, t-value between Group A and Group B is= 9.5583 and $p < 0.0001$.

Table 1

Comparison of Pre-Test values of WATER DISPLACEMENT and BORG scale of Group A and Group B

Parameters	Pre-Test values of Group A		Pre-Test values of Group B	
	Mean	S.D	Mean	S.D
WATER DISPLACEMENT (ml)	13066	1579.63	12866	1846.49
BORG	13.40	1.64	12.93	1.91

Graph 1 – PRE TEST VALUES OF WATER DISPLACEMENT



Graph 2- PRE TEST VALUES OF BORG

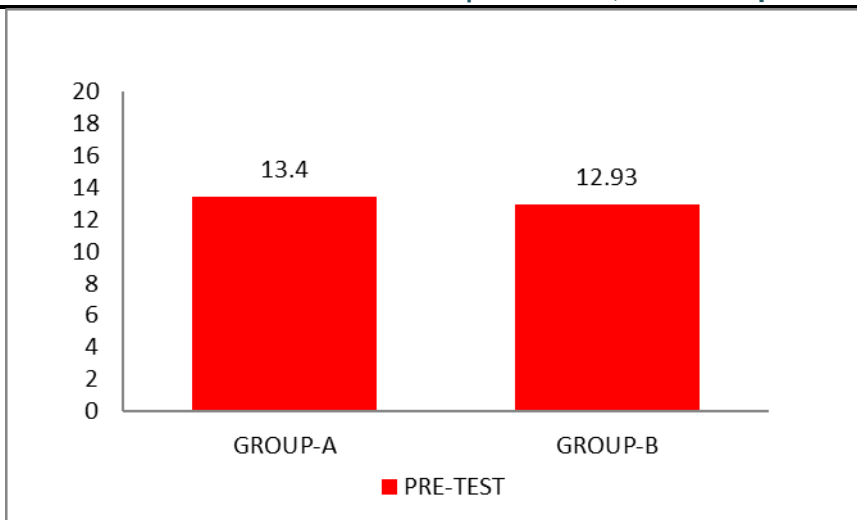


Table 2

Comparison of Pre-Test and Post-Test values of WATER DISPLACEMENT and BORG scale of Group A

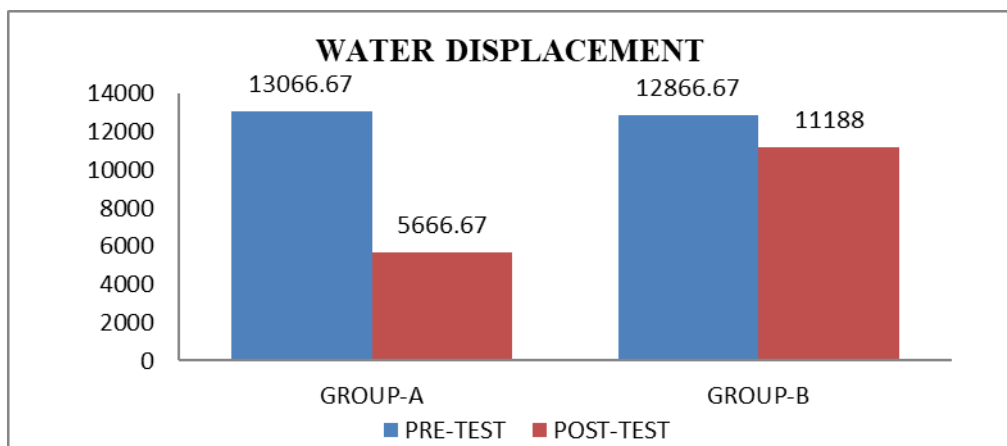
Parameters	Pre-Test		Post-Test		t test value	p test value
	Mean	S.D	Mean	S.D		
WATER DISPLACEMENT (ml)	13066.67	1579.63	5666.67	1234.43	22.0742	<0.0001
BORG	13.40	1.64	7.47	1.19	23.9085	<0.0001

Table 3

Comparison of Pre- test and Post-test values of WATER DISPLACEMENT and BORG scale of Group B

Parameters	Pre-Test		Post-Test		't' test value	'p' test Value
	Mean	S.D	Mean	S.D		
WATER DISPLACEMENT (ml)	12866	1846.49	11188	1865.82	2.4757	0.0196
BORG	12.93	1.91	11.13	2.0	2.5208	0.0177

Graph 3 - WATER DISPLACEMENT



Graph 4 - BORG

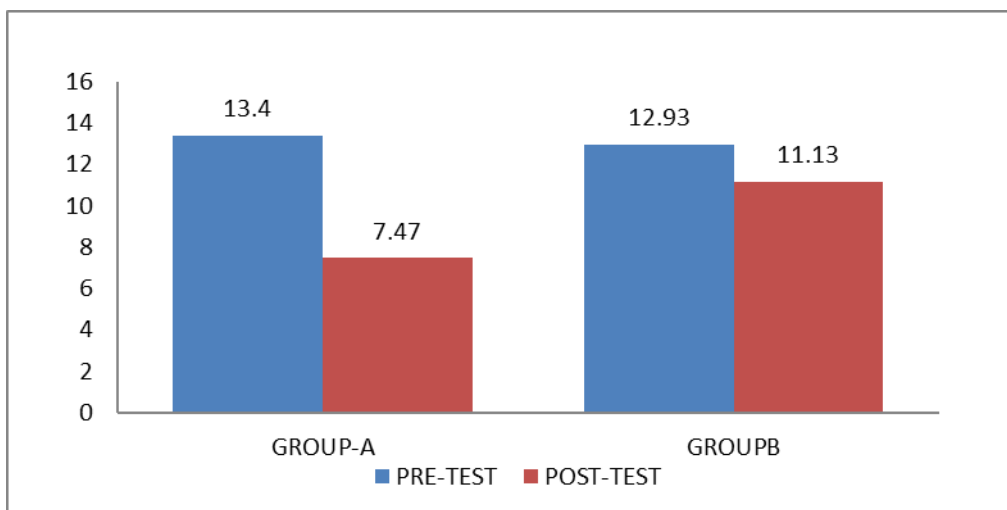


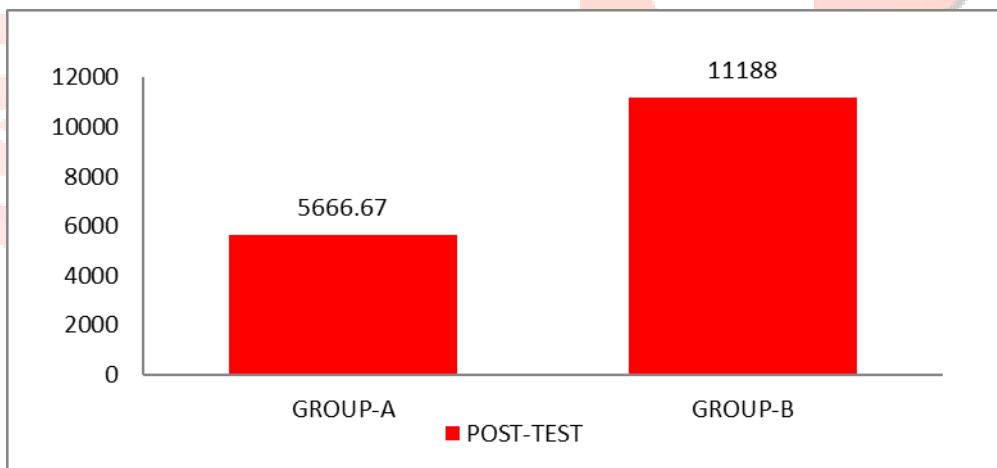
Table 5

Comparison of post test values of WATER DISPLACEMENT and BORG Group A & Group B

Parameters	Post-test (GroupA)		Post-test (GroupB)		't' test value	'p' test value
	Mean	S.D	Mean	S.D		
WATER DISPLACEMENT (ml)	5666	1234.43	11188	1856.82	9.5917	<0.0001
BORG	7.4700	1.1900	11.1300	2.0	6.0909	<0.0001

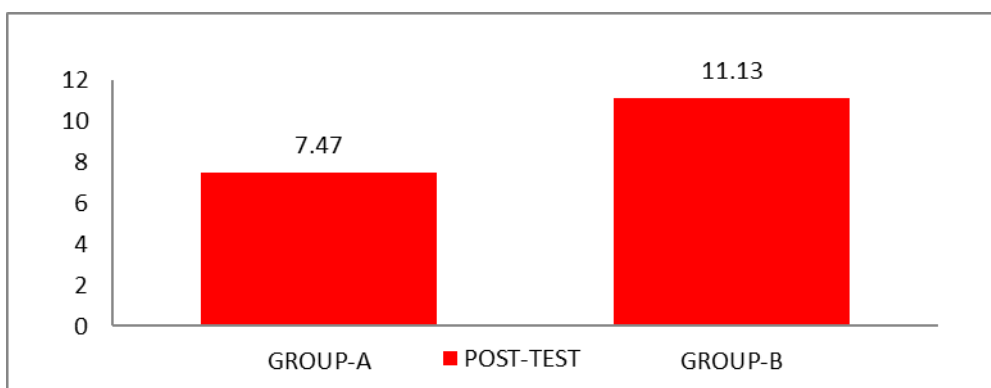
GRAPH - 5 WATER DISPLACEMENT

Comparison of post test values of group A and group B water displacement:



GRAPH - 6 BORG

Comparison of post test values group A group B of borg:



VI. DISCUSSION: Upper extremity lymphedema can occur on following lymph node removal or radiation following breast cancer diagnosis and treatment. The number of patients suffering from lymphedema is constantly growing due to the increasing number of patients surviving cancer as well as the increasing awareness of treatment for lymphedema. Unfortunately lymphedema can be extremely debilitating for the patient, greatly impacting functional abilities, range of motion, and greatly decreasing their quality of life. Fortunately, there is a gold-standard treatment for lymphedema, Complete Decongestive Therapy, which has been shown to effectively manage the condition.

Most studies recommend a frequency of 5 times per week during the initial stage of treatment to decrease lymphedema. Unfortunately, this was unattainable due to various factors in this study. However, this study still proves that reductions in limb volume and circumference are possible in cases where frequency of therapy is suboptimal. This could be attributed to a number of factors, including a relatively low level of lymphedema, the increased emphasis on the home exercise program (including instruction in self-manual lymph drainage), and/or the high level of motivation in the patient. The increased emphasis on the home program and self-care was due to the breast reconstruction in the middle of her physical therapy treatments, likely lengthening the duration of treatment and decreasing the speed of results. One of the limitations of this study is the breast reconstruction during the middle of the physical therapy treatments. The patient was forced to take time off from physical therapy, likely slowing the reduction of upper extremity volume. Another limitation was the decreased frequency per week of this patient. While a larger reduction in limb volume should be taken (as final upper limb measurements were compared both the upper limbs by using water displacement method), a quicker reduction in volume was to be expected, as the entire course of her therapy was 2 weeks in duration. By increasing the frequency of her sessions, the patient likely would have been discharged from therapy in the traditional four week timeline (Holtgreffe, 2006; Morrell *et al.*, 2005)²¹.

Many studies have specific compliance with the home exercise program. The patient demonstrated competency in the application of the self-manual lymph drainage strokes and techniques, compliance is always in question when home programs are prescribed.

A final limitation for this study is that this was a relatively mild case of lymphedema. Further studies are needed to determine if a lesser frequency still is efficacious for more extreme cases of lymphedema, as well as to determine if these findings hold true on a larger scale. This case presentation demonstrates the effectiveness of a home exercise program as the primary focus with self-manual lymph drainage as the primary intervention.

Lymphedema is a devastating condition that affects a large number of people. It can be caused by a wide variety of factors; however it is most commonly associated with cancer treatments in the United States. Complete Decongestive Therapy or CDT is a method that involves four different interventions: compression bandaging, therapeutic exercise, fastidious skin care, and manual lymph drainage, and has been shown to be very effective both in research trials and in clinical scenarios. Manual lymph drainage itself has three main schools of thought, each bringing their own ideas to the table.

The Borg Rating of Perceived Exertion (RPE) is a way of measuring physical activity intensity level. Perceived exertion is how hard you feel like your body is working. It is based on the physical sensations a person experiences during physical activity, including increased heart rate, increased respiration or breathing rate, increased sweating, and muscle fatigue. Although this is a subjective measure, a person's exertion rating may provide a fairly good estimate of the actual heart rate during physical activity.

Look at the rating scale below while you are engaging in an activity; it ranges from 6 to 20, where 6 means "no exertion at all" and 20 means "maximal exertion." Choose the number from below that best describes your level of exertion. This will give you a good idea of the intensity level of your activity, and you can use this information to speed up or slow down your movements to reach your desired range. Try to appraise your feeling of exertion as honestly as possible, without thinking about what the actual physical load is your own feeling of effort and exertion is important, not how it compares to other people's. Look at the scales and the expressions and then give a number.

The golden methods are the Vodders method, the Földi method, and the Casley-Smith method. While each and every method is different type of strokes and massaging technique for draining lymph fluid to reduce the limb volume. Current research suggests a treatment frequency of five times per week or the first four weeks of clinically-heavy treatment ((Holtgreffe, 2006; Morrell *et al.*, 2012)^{22,23}.

And my study which determines the effectiveness of vodders technique with compression bandaging on breathlessness and limb volume among lymphedema with unilateral mastectomy subjects. Were statistically significant reductions in limb volume and breathlessness among lymphedema with unilateral mastectomy subjects. Lymphedema therapy still is, in many ways, a developing field for physical therapists. While more research is needed in many areas of lymphedema therapy, such as pathology, diagnosis, measurement techniques, or treatment frequency, there have been large advancements made in recent years in terms of treatment and reimbursement, greatly increasing the quality of life of patients suffering from lymphedema.

VII. CONCLUSION: The study result showed that vodders technique along with compression bandage is effective than by giving compression bandage in alone reduction of limb volume and breathlessness in subjects with unilateral mastectomy.

VIII. REFERENCE:

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