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Study Regarding the Effectiveness of Manual Lymphatic Drainage in the Case of Patients with Breast Cancer that Present Lymphedema

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Abstract

Lymphedema is defined as a persistent increase of tissue volume caused by the blocked or absent lymphatic drainage. The purpose of this study is to analyse the effectiveness of lymphatic drainage in the treatment of lymphedema after a mastectomy, with the aim of reducing the volume of the lymphedema and improving overall symptomatology, as well as providing information regarding the impact of this treatment on quality-of-life and the physical limitations of these patients. With these objectives in mind, a series of articles evaluating the effectiveness of manual lymphatic drainage in the case of patients with breast cancer and lymphedema have been studied. The parameters under observation were: duration of lymphedema reduction and improved symptomatology (pain, a feeling of swelling of the upper limb, functional limitation, and patient dissatisfaction towards their body image). Following this analysis, one can conclude that the association of manual lymphatic drainage to physical exercise and physiotherapy has produced changes in the volume of the limb affected by the lymphedema; however, its isolated use has not resulted in significant changes.

Key words: *lymphedema, manual lymphatic drainage, breast cancer, volume, effectiveness*

Rezumat

Limfedemul este definit ca fiind creșterea persistentă de volum a unui țesut cauzată de blocarea sau absența drenajului limfatic. Scopul acestui studiu este de a analiza eficacitatea drenajului limfatic manual în tratamentul limfedemului postmastectomie, cu scopul reducerii volumului limfedemului și îmbunătățirii simptomatologiei, precum și furnizarea informațiilor cu privire la impactul acestui tratament asupra calității vieții și a limitărilor fizice ale acestor pacienți. Pentru aceasta am studiat o serie de articole recente care au evaluat eficacitatea drenajului limfatic manual la pacienții cu cancer de sân care prezintă limfedem. Parametrii urmăriți au fost: durata reducerii limfedemului și îmbunătățirea simptomatologiei (durere, senzația de tumefiere a membrului superior, limitarea funcțională, nemulțumirea pacientului față de propria imagine corporală). În urma analizei noastre concluzionăm că asocierea drenajului limfatic manual cu exercițiul fizic și cu fizioterapia au produs modificări ale volumului brațului afectat de limfedem, dar utilizarea lui izolată nu a dus la modificări semnificative.

Cuvinte cheie: *limfedem, drenaj limfatic manual, cancer de sân, volum, eficacitate*

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Introduction

At present, breast neoplasm has an incidence of 35-45 new cases in 100,000/year, with a rising frequency. [1]

The early detection and treatment of breast neoplasm has significantly improved during the last decades, a factor which makes the survival rate higher.

Special attention is currently being given to lymphatic oedema that appears after the removal of axillary lymph nodes.

Lymphedema consists of the accumulation of lymph in the interstitial spaces caused by the blocked or absent lymphatic drainage, followed by the increase in volume of the arm with 200 ml or more compared to the value before surgical intervention, or a difference of 2 cm or higher in the diameter of the arm.[2,3,4]

The problems that appear after lymphedema has installed are: pain, discomfort, a feeling of weight in the upper limb, deformation of the arm, reduction of the degree of mobility, infections, erysipelas, a sense of psychological suffering which can lead to social isolation.[5]

The methods of therapy used are: compressive bandages, manual lymphatic drainage, physical exercises combined with CPT – Complex Physical Therapy.

The purpose of this study was to analyse the effectiveness of applying manual lymphatic drainage in the treatment of lymphedema after mastectomy, either isolated or associated with other techniques, aiming to reduce the volume of the lymphedema and improve symptomatology.

The present paper provides an analysis of recent studies regarding the effects of manual lymphatic drainage in preventing and treating lymphedema after mastectomy.

The vast majority of the studies had inconclusive results, most probably caused by the small sample groups used in the research.

The criteria of selection used in the studies taken from the specialised literature were:

1. The criteria of inclusion and exclusion used to select the patients
2. The technique of manual lymphatic drainage used
3. The technique of compression used
4. The definition of lymphedema
5. The evaluation of the severity of the lymphedema
6. The association of physical exercises
7. The association of CPT – Complex Physical Therapy

A number of studies have been excluded because they fulfilled at least one of the following criteria:

1. They involved patients who did not have they are axillary lymph nodes removed
2. The clinical results were not clearly specified

The studies used in the research were found by searching the PubMed database, using the following keywords: manual lymphatic drainage, breast cancer or breast neoplasm, lymphedema.

Martín M. L. et al. (2011) have conducted a clinical study on 58 female patients that presented lymphedema after mastectomy and have divided them into two groups: the control group of 29 patients who followed a standard treatment - skin care, exercises and compressions, application of bandages for a month and, ultimately, compression clothing - and the experimental group consisting of 29 patients that underwent the standard treatment coupled with manual lymphatic drainage. In this study, the treatment was applied on a daily basis over a period of four weeks, while the state of the patients was evaluated after a month, three months and six months after the treatment commenced. The parameters under scrutiny were to reduce the

volume of the arm, the duration of the lymphedema's reduction and the improvement of symptomatology (pain, tumefaction, functional impotence, dissatisfaction with body image). The reduction of the arm's volume was the only result achieved. The condition for a lymphedema to be considered is a difference of at least 200 ml between the volume of the affected arm (measured with a circometer and calculated using the truncated cone formula) and the volume of the collateral arm. The response is considered to be good when a reduction of at least 20% in volume is reached after applying treatment to the lymphedema in the affected area, when compared to the initial value. These measurements will be conducted at the beginning of the study, after the first month, after the third month and after six months since the investigation's commencement. The difference in volume was used to predetermine the size of the sample group. [6]

The treatment of lymphedema remains a problem even in the context of modern methods of treatment, such as Complex Physical Therapy (CPT). Also called Complex Decongestive Physiotherapy, it is a scheme of treatment that includes a meticulous hygiene of the skin, manual lymphatic drainage, bandages, exercises and supportive clothing. This therapy is conducted into phases: in the first phase (treatment), the purpose is to mobilise the accumulated lymph, to reduce fibrous tissue and to improve the skin's state of health by using Manual Lymphatic Drainage (MLD) on a daily basis. Furthermore, the patients receive instructions in regards to skin care, measures of prophylaxis and use of multilayer bandages. In the second phase (maintenance), compression bandages, regular physical exercises and weight control are employed. [7]

Although the first results have been optimistic, CPT did not clearly demonstrate superiority when compared to other alternatives in the studies conducted by Ramos A.M. et al. (1999), and no study has evaluated the patients' preference for a specific treatment or the effects of the treatment on quality-of-life. [8]

Wozniowski M. et al. (2001) and Mcneely M. et al. (2004) suggest that this technique should be used only in selected cases. Using CPT to stimulate drainage of the lymph has a profound physiological basis; however, the quality of the evidence regarding the relative effectiveness of this type of therapy is unsatisfactory. On the other hand, the fact that CPT involves a number of techniques (manual lymphatic drainage, skin care and multilayer bandages followed by an item of compressive clothing to reduce the oedema, therapeutic exercises) makes it difficult to recognise which one of them is truly effective when treating lymphedema. [9,10]

Only three small studies have evaluated manual lymphatic drainage for the lymphedema of the arm. In the first study conducted by Johansson K. et al. (1999), the compression with bandages coupled with manual lymphatic drainage has been compared to compression with simple bandages. 38 patients participated in the study, who underwent compression with simple bandages for two weeks and compression with bandages coupled with manual lymphatic drainage for one week. The average value of volume reduction in the case of the lymphedema was 20 ml for the treatment using compression with simple bandages, and 47 ml for the treatment using compression with bandages coupled with manual lymphatic drainage. These differences were not significant. [11]

In the second study conducted by Johansson K. et al. (1998), manual lymphatic drainage was compared with Sequential Pneumatic Compression

(SPC) for the treatment of lymphedema at the arm in the case of 28 patients previously treated for breast cancer. Both treatments were conducted for two weeks. The lymphedema was reduced by 49 ml (7%) in the case of treatment with SPC, and 75 ml (15%) when MLD was employed. Both MLD and SPC have led to the decrease in volume of the lymphedema; however, no significant difference has been noticed between the two methods. [12]

The third study conducted by Andersen L. et al. (2000), which involves 42 patients with stage I or II lymphedema, has compared standard therapy with MLD + standard therapy and initiation in self massage. The standard therapy included compression clothing (personalised sleeve and glove used during the day), instruction regarding physical exercises, education in skin care, as well as information and recommendations regarding lymphedema. Both groups have obtained a significant reduction in volume at the level of the limbs, a decrease in discomfort and an increase in joint mobility over a period of time. Still, there are no significant differences between the two groups as regards the objective measures to the changes in volume of the limbs or the subjective measures linked to symptoms of lymphedema. This study has investigated the effects of 8 sessions of MLD for 2 weeks, so the time of application was relatively low and the study group was limited to those with slight to moderate swelling (20-30% of the difference).[13]

Discussions:

The results of this study will supply information regarding the effectiveness of MLD and its impact on quality-of-life and the physical limitations of these patients.

The published studies that aimed the effectiveness of MLD have presented contradictory results.

Vignes S. et al. (2011) conducted a prospective study on 682 cases in which various treatments for lymphedema have been evaluated. The results were:

- The risk of failure following the application of intense decongestive physiotherapy has been associated with young obese patients with a BMI (body mass index) of over 30kg/m².
- The applications of an elastic sleeve and the treatment with multilayer bandages have been associated with a reduced risk of failure.
- The use of MLD as an adjuvant therapy was not mentioned. [14]

Lacomba M.T. et al. (2010) have shown a preventive effect of a combination between MLD and therapy through physical exercise in the development of the lymphedema. They have included hundred and 20 patients who underwent removal of axillary lymph nodes; their treatment lasted for four weeks; one year after the operation, 7% of the patients from the target group and 25% of the patients from the control group (those who did not undergo MLD and physical exercises; they only used compressive bandages) developed lymphedema. This occurred 6-12 months after surgical intervention. [4]

The compression bandages have been proven effective when dealing with lymphedema. Badger C. et al. (2000) have conducted a study to compare the usage of compression bandages for 18 days followed by compression clothing (treatment group) as opposed to using only compression clothing (comparison group). These authors have reported a significant reduction in volume at the level of the limbs after 24 weeks in the case of the treatment group, as opposed to the comparison group. [15]

The revisited studies have investigated numerous types of therapy through compression. McNeely M. (2004) has noted that the figure of eight method has been more effective in maintaining a correct position of bandage and a level of comfort for the patient,

when compared to spiral bandaging. McNeely M. (2004) has replaced bandages five times a week during the treatment period (which lasted for four months), while Johansson replaced bandages every two days for three weeks [9].

Devoogdt N. et al. (2011) have evaluated the effective MLD used together with therapy through exercises and instruction to prevent lymphedema in the case of 160 patients with breast cancer and lymph nodes in the unilateral axillary area; the patients were ordered according to BMI and axillary irradiation. [16]

Conclusions

Devoogdt N. et al. (2011) have concluded that manual lymphatic drainage is not likely to have a moderate to high effect in reducing the incidence of lymphedema on a short-term, when compared to compressive bandages and therapy through exercises after the removal of the axillary lymphatic nodes. [16]

The conclusion of the analysis conducted by Tsai-Wei Huang et al. (2013) is that the addition of MLD to compression therapy and exercises when treating lymphedema after operating on lymphatic nodes in the axillary area for breast cancer is not likely to produce a significant reduction in the volume of the affected arm. No significant difference in the incidence of lymphedema in the case of patients treated with or without MLD assets are. [17]

Following this analysis, one can conclude that associating MLD with physical exercise and physiotherapy has produced changes in the volume of the arm affected by lymphedema, but its isolated use has not led to significant changes.

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