

Effectiveness of Lymphedema Treatments and Patients' Perception of Their Quality of Life

Caroline Radlinger
Kathy Moulis

Faculty Sponsors: Robin Mc Cannon, Occupational Therapy and
Abdulaziz Elfessi, Department of Mathematics,

ABSTRACT

Lymphedema is the swelling of one or more body parts due to obstruction, damage, removal or congenital absence of the lymph vessels, which would otherwise drain the fluid that accumulates in the body. The purpose of this study was to determine the effectiveness of two lymphedema treatments and how these two treatments impacted the subjects' perceptions of their quality of life. The two treatments compared were compression garment with manual lymph drainage and compression garment alone. This study was a collaboration between two occupational therapy students and area occupational therapists who completed the treatments. The focus of this study was on what treatment group would have greatest decrease in limb size and the subject's resulting perception of health and well-being. Subjects provided the researchers with information on four different occasions over a twelve-week period. The design of this study was a follow-up quantitative experimental research design. The repeated measures analysis of variance was used to evaluate the data. Quality of life was shown to increase over time for both treatment groups. Total girth decreased in visits 1 through 4 in the compression garment group. There was a trend for a decrease in total girth measurements in visits 1 through 3 in the manual lymph drainage with compression garment group, however this was not statistically significant. Keywords: lymphedema, manual lymph drainage, compression garment, quality of life.

INTRODUCTION

Lymphedema is a swelling of one or more body parts due to obstruction, damage, removal or congenital absence of the lymph vessels, which would otherwise drain the fluid that accumulates in the body. Untreated lymphedema can cause chronic inflammation, cellulitis, pain, fatigue, cosmetic deformity, and a significant decrease in the patient's range of motion, mobility, and functional use of the affected extremity. The treatment of lymphedema usually consists of manual lymph drainage (MLD) and/or compression garments. According to Tribe (1995), MLD is a special form of massage performed to the affected limb to increase activity in normal lymphatics. The massage intends to by-pass the ineffective or obliterated lymph vessels and transfer lymph over "watersheds" into neighboring areas of the body. Compression garments are used to compensate for the stretched tissue that would otherwise allow rapid refilling (Tribe, 1996). There are many studies that demonstrate the importance of using both compression garments and MLD in reducing limb size (Matthews & Smith, 1996; Dennis, 1993). For example, the study by Mathews and Smith (1996) demonstrated

that both treatment programs resulted in large reductions in lymphedema, which were maintained or improved after completion of the series of treatment massage sessions. Mathews and Smith (1996) attributed the continued improvement largely to the maintenance of fairly strong compression on a 24-hour basis. The study performed by Dennis (1993) stated that compression garment use is needed in conjunction with manual lymph drainage to compensate for the laxity of the stretched tissue that would otherwise allow rapid refilling. Dennis (1993) also demonstrated that satisfaction of treatment outcome with lymphedema is related to lifestyle. According to this study, underlying a successful treatment outcome is a secure and active lifestyle that included secure employment, leisure interests, good social support networks, and a high self-esteem (Dennis 1993). However, a study by Bowering (1998) stated that compression garment therapy alone was an effective and safe treatment.

Further research is needed to determine whether compression garments alone, or compression garments and manual lymph drainage together, provide the most beneficial treatment to patients diagnosed with upper or lower extremity lymphedema, and which treatment is the most beneficial in increasing patient life satisfaction (Dennis 1993). A decrease in limb size and an increase in quality of life would indicate beneficial treatment outcomes. Furthermore, this research would be beneficial to the field of occupational therapy, which provides both types of treatment, by providing information so that occupational therapists can determine appropriate treatment based on client needs.

The proposed outcome of this study is to determine the effectiveness of two treatments in decreasing limb size and increasing the patient's resulting perception of health and well-being. Clinical researchers have broadened their definition of clinical outcome to include a concern for the patient's "quality of life." A number of studies have shown that it is the patients' subjective well-being, rather than their objective medical condition, that determines their treatment-seeking behavior, their compliance, and their evaluation of treatment (Gladis et al., 1999). The Canadian Occupational Performance Measure (COPM), written by Mary Law, et. al.(1994), was used to interview the subjects in order to obtain data regarding the patient's perspective on their quality of life (1994). The COPM provides a quantitative rating of the person's ability and satisfaction associated with the performance of life tasks, and is a good measure of quality of life (Christiansen & Baum, 1997). COPM performance is the subject's perception of how well he/she completes daily life tasks. COPM satisfaction is the subject's perception of how happy he/she is with his/her performance on daily life tasks. The COPM is an individualized measure designed for use by occupational therapists to detect self-perceived change in occupational performance problems over time. The test-retest reliability using this measure for interclass correlation coefficients were .63 for performance and .84 for satisfaction. A pilot study conducted by a COPM research group found that the mean change scores in performance and satisfaction (statistically significant, $p=.0001$) indicate that the COPM is responsive to changes in perception of occupational performance by clients (Hemphill-Pearson, 1999). The validity of the COPM was determined by examining how responsive these scores were to changes in self-perceived occupational performance over time. COPM scores correlated higher with independent ratings of client function than did two other occupational performance measures studied (Asher, 1996). Our research subjects were interviewed and asked about their daily activities in self-care, productivity, and leisure. The subjects identified daily activities that they want to do, need to do, or are expected to do in a typical day. The subjects then identified which of these activities were difficult for them to do currently to their satisfaction.

Subjects were also given an activity wheel to complete at home. The activity wheel consists of the subjects identifying how they spent their time in a 24-hour period (Rosenfeld, 1993). This was used to determine if there were other factors influencing their quality of life. For example, if there was a death in the subject's family this would be evident in the activity wheel. The subjects mailed the activity wheel back to the researchers within 48 hours of completion.

The quantifiable outcome of a decrease in limb size was measured by a registered occupational therapist (OTR) that is certified in comprehensive lymphedema/venous Edema management-level 1 at each of the four visits using a tape measure to the nearest millimeter. The OTR was responsible for taking all of the upper or lower limb girth measurements on the subjects' affected sides. Measurements were taken over a course of four separate visits.

The hypothesis of our study is that manual lymph drainage with compression garments together will decrease the girth measurements and increase the quality of life greater than compression garments alone.

METHOD

All subjects were referred to occupational therapy by their physician for lymphedema management. At that time treatment options were explained to the subjects, and they were allowed to choose which treatment they wanted to receive. Therefore, subjects were not randomized. A subject's choice of treatment was based on time constraints, as well as medical diagnosis. For example, if a subject had active cancer, MLD is contraindicated, and therefore, his or her only choice was compression garment treatment.

Subjects provided the researchers with information on four different occasions. Each occasion included an interview given by one of the two researchers in person, an activity wheel for the subjects to fill out, and girth measurements measured by an occupational therapist. Each time the subjects were seen their girth measurements were measured three times and then averaged. The first interview, activity wheel, and girth measurements were performed during the initial evaluation. The second interview, activity wheel, and girth measurements were performed two weeks after the initial evaluation. The third interview, activity wheel, and girth measurements were performed two weeks after the second interview. The final interview, activity wheel, and girth measurements were performed eight weeks after the third interview. To obtain subject compliance the researchers traveled to the subjects' homes to obtain the data, with prior approval from the subjects. This design reflects as closely as possible the evaluation timeline used in clinical situations.

Pictures of the subjects' affected limbs were taken with a digital camera each time they were seen by the researchers. The researchers felt that pictures added a visual perspective to the quantitative data of girth measurements.

After data collection was completed, the researchers used repeated measures analysis of variance (ANOVA) to determine which treatment group provided the best results in terms of decreased girth and increased quality of life across time. Alpha was set to 0.05. All statistical procedures were performed on Statistical Package for the Social Sciences (SPSS) (Bailey, 1997).

RESULTS

In the compression garment treatment group there were 4 subjects. In the manual lymph drainage with compression garment treatment group there were 5 subjects.

In regards to COPM performance and COPM satisfaction, both treatment groups demonstrated a significant improvement in scores from visit one to visit four. COPM performance significance is $p=.001$. COPM satisfaction significance is $p=.005$. There was no statistical difference between the groups. Results indicate both treatments were just as effective in increasing both patient performance and satisfaction as measured by the COPM.

The mean results of total girth decrease for visit one through four of both treatment groups are in Table 1. The standard deviation of total girth difference for all visits of both treatment groups is listed in Table 1.

Table 1. Total Girth of Affected Extremity

Group	Visit	Mean (inches)	Standard Deviation (inches)
Compression garment	1	115.878	15.262
	2	114.003	5.870
	3	109.142	14.882
	4	108.375	14.868
Manual lymph drainage with compression garment	1	123.964	13.651
	2	121.700	14.195
	3	120.564	13.311
	4	125.426	13.298

In regards to total girth, there was a statistically significant difference within subjects for time (visits), $p=.009$. There was a significant difference of $p=.007$ between the two treatment groups and time. To further evaluate where those differences occurred, paired T tests were completed using SPSS. These results indicate that within the compression garment group, there was a statistically significant difference in time $p=.007$. A statistically significant difference in girth measurements was noted between the following visits: visit 1 and 3; $p=.016$, visit 1 and 4; $p=.021$, visit 2 and 4; $p=.012$,

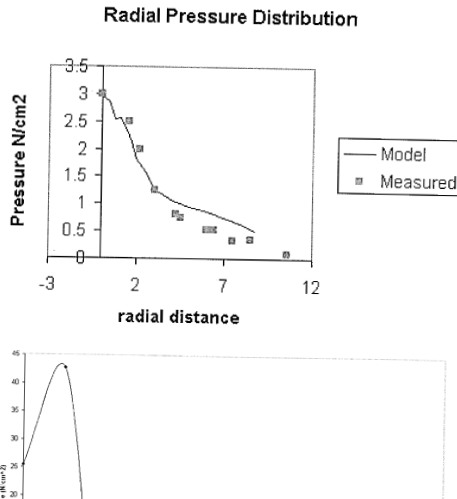


Figure 1

visit 2 and 3; $p=.010$. When looking at the means for these visits, the mean decreased in value, indicating that girth measurements decreased, therefore supporting the treatment consisting of compression garment was effective in decreasing edema. Within the MLD with compression garment group, there was marginal significance between visits $p=.085$, but this was not statistically significant at alpha $.05$. When looking at the means, this group did demonstrate decreased girth measurements, visit 1 through 3, but this decrease was not statistically significant. It is interesting to note that the mean increased between visit 3 and 4. Refer to figure 1. After reviewing the activity wheel assessments, there were no significant changes in our subjects' lives that would be a contributing factor in their quality of life.

DISCUSSION

We hypothesized that the MLD with compression garment group would have a greater decrease in girth measurements and have a greater increase in quality of life than the compression garment group. However, our results indicate that both treatment groups displayed an increase in quality of life, not just the MLD with compression garment group. Furthermore, our results did not demonstrate a statistically significant decrease in the MLD with compression garment group's girth measurements. The compression garment group demonstrated a statistically significant decrease in total girth measurement between visits 1 - 3, 1 - 4, 2 - 4, and 2 - 3.

A possible reason why the manual lymph drainage with compression garment treatment group had an increase in total girth difference at the fourth visit could be due to patients being discharged after the third visit; therefore, the MLD was no longer being performed. Subject noncompliance with the treatment program is another possible reason for the slight increase in girth at visit four for the MLD with compression garment group. Furthermore, the duration that the subjects had been diagnosed with their lymphedema may have affected the results. For example, a patient who received treatment right after being diagnosed may have better results than a patient who had been diagnosed a year or years before receiving treatment. Time of day could have affected the differences in girth measurements between the two groups. All subjects were not restricted to the same exact appointment time. This is important because girth measurements differ depending on the time of day. For example, if a subject's first visit was early in the morning and then his/her second visit was at the end of the day (after the subject was standing all day) his or her limb could be larger due to the stress placed on the limb. Our time line regarding when the visits were scheduled could have affected the differences in girth measurements between the two groups. The time line of the four visits was not always strictly enforced due to normal patient scheduling conflicts (i.e., vacations, illness, etc). It is interesting to note that in the MLD with compression garment group all subjects had lymphedema in their arm and most of the compression garment group had lymphedema in their lower extremity. Lastly, the small sample size of our study may have affected our results due to not being able to attain a generalized sample of people with lymphedema.

We believe subjects' quality of life increased in both treatment groups because they were currently in treatment and had good relationships with their therapists. Furthermore, the subjects' personal goals were continually improving toward total achievement. Having the quality of life increase for both treatment groups is a very positive finding because therapists can feel comfortable suggesting either treatment, and know they are positively impacting their client's quality of life.

CONCLUSIONS

We conclude that both treatment techniques are valuable to the patients who have lymphedema in increasing their quality of life along with their decrease in overall girth measurements. Results indicated that compression garment treatment alone decrease lymphedema significantly, however, there are extraneous variables that may have factored into the study. Also, due to only having nine subjects, it is difficult to generalize our results to other lymphedema patients.

LIMITATIONS

A limitation of our study is being unable to randomize subjects. Subjects could not be randomized due to subjects along with their therapist choosing the most appropriate treatment technique.

Furthermore, quality of life was self-reported, which is not always well defined.

ACKNOWLEDGEMENTS

We would like to thank Franciscan Skemp Healthcare Center for allowing us to use their patients in our study, and the two OTR's who performed the treatments and measurements for our study, Paula Weiss and Kristin Tancil. We would also like to thank Robin McCannon, MS, OTR for sponsoring and advising us on our research project, and Dr. Abdulaziz Elfessi, Ph.D. for all his help in interpreting our data.

REFERENCES

- Asher, I. (1996). *Occupational therapy assessment tools* (2nd ed.). Bethesda, MD:AOTA.
- Bailey, D. (1997). *Research for the health professional* (2nd ed.). Philadelphia: F.A. Davis.
- Bowering, C. (1998). Use of Layered Compression Bandages in Diabetic Patients. *The Journal for Prevention and Healing*, May/June, 120-135.
- Christiansen, C. & Baum, C. (1997). *Enabling function & well-being*. New Jersey: Slack.
- Dennis, B. (1993). Acquired lymphedema: A chart review of nine women's responses to intervention. *America Journal of Occupational Therapy*, 47, 891-899.
- Gladis, M., Gosch, E., Dishuk, N., & Crits-Christoph, P. (1999). Quality of life: Expanding the scope of clinical significance. *Journal of Consulting & Clinical Psychology*, 67 (3), 320-331.
- Hemphill-Pearson, B. (1999). *Assessments in occupational therapy mental health*. New Jersey: Slack.
- Law, M, Baptiste, S., Carswell, A., McColl, M., Polatajko, H., & Pollock, N. (1994). *Canadian occupational performance measure*. Toronto, Ontario: CAOT Publications ACE.
- Mathews, K., Smith, J. (1996). Effectiveness of modified complex physical therapy for lymphoedema treatment. *Australian Journal of Physiotherapy*, 42 (4), 323-8.
- Rosenfeld, M. (1993). *Wellness and lifestyle renewal*. Bethesda, MD:AOTA.
- Tribe, K. (1995). Treatment of lymphedema the central importance of manual lymph drainage. *Physiotherapy*, 81 (3), 154-6.