2017 | Congrès national du lymphœdème
National Lymphedema Conference

ABSTRACTS

Oral Presentations

ABSTRACT 1.1

Introducing self-bandaging in the management of lymphedema: a perspective on utilizing the therapeutics of communication to address patient-reported barriers

Research on the effectiveness of self-bandaging for self-management of lymphedema shows positive outcomes over the long-term. In a multi-centre randomized controlled trial examining the addition of night-time compression, patient-reported barriers included lack of confidence in self-bandaging and negative burden on lifestyle as reasons for refusing trial participation.[1] This difference between positive research-reported outcomes and negative patient-reported perspectives poses a significant question concerning how healthcare professionals and patients communicate about lymphedema self-bandaging interventions—namely, how do we clinically address this disparity and effectively implement self-bandaging as a management strategy for lymphedema?

Healthcare-communication is a key area for research and improvement of healthcare systems. Recent advancements in healthcare-communication report that patient-centred terminology is highly effective in clinical interventions.[2] A formal search of the literature in ESCBO, CINHL, OVID and MEDLINE conducted between January and March 2017 resulted in no findings that report formally on the therapeutic-communication-pathways and lexicon pertaining to lymphedema self-bandaging approaches and techniques. A systematic review on the impact of communication strategies on outcomes in chronic condition management, including cancer, reports the benefits of patient-empowerment in long-term interventions; the preliminary results of the therapeutic use of communication pathways includes better patient understanding, trust, and agreement.[2] These results affect intermediate outcomes, such as adherence to interventions, which in turn influence overall wellness and health practices.[2]
Exploring how communication supports participation in self-bandaging interventions, this presentation, directed towards healthcare professionals, will (1) review current research, (2) describe the terminology and approach typically used in discussing self-bandaging from a standard medical-model versus other patient-centred pathways of care, and (3) offer practical strategies for approaching self-bandaging using these alternative frameworks to support concepts of patient autonomy, hope, and resilience. This session will introduce healthcare professionals to the concept of a progressive lexicon that can help address and overcome patient barriers to effective self-bandaging regimens.

1. McNeely, M. L., Campbell, K. L., Webster, M., Kuusk, U., Tracey, K., & Mackey, J. (2016). Efficacy of night-time compression for breast cancer related lymphedema (LYNC): protocol for a multi-centre, randomized controlled efficacy trial. *BMC cancer*, *16*(1), 601.

2. Richard L. Street Jr., Gregory Makoul, Neeraj K. Arora, Ronald M. Epstein, How does communication heal? Pathways linking clinician–patient communication to health outcomes, Patient Education and Counseling, Volume 74, Issue 3, March 2009, Pages 295-301, ISSN 0738-3991, http://dx.doi.org/10.1016/j.pec.2008.11.015.

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ABSTRACT 1.2

Manual Lymph Drainage (MLD) and compression in a wound care treatment plan with patients living with lymphedema – Two case studies

Introduction:

Left untreated, lymphedema (L.E) not only causes tissue channels to increase in size and number, but also reduces oxygen availability in the transport system. L.E. can also interfere with wound healing at a cellular level by providing a culture medium for bacteria that can result in infection. Reduction of L.E. usually has a positive effect on wound healing, as it improves nutrient supply, lymphocytes and growth factors to the cells as well as the removal of degradation products. Moreover, it may help in cases of an infected wound by reducing the bacteria growth medium.

Objectives:

To show the effectiveness of Manual Lymph Drainage (MLD) & short stretch compression bandages on wound healing in patients suffering of L.E.

Intervention:

MLD and short stretch bandages 3-5 times per week, for 6 weeks and wound care dressing. Applied to a patient with lower limb wound lasting for 19 years suffering from lipo-phlebo-lymphedema, and to another patient following a post-mastectomy wound lasting for 6 months with trunk L.E.

Results:

Clinically significant reduction of L.E., wound closure, reduction of pain as well as discontinued usage of antibiotics after 6 weeks of treatment, compared to the pre-treatment condition.

Conclusion:

According to our clinical experience, sustained edema reduction is essential for preventing disruptions in chronic wound healing. Effective wound care in L.E. patients should include compression therapy & MLD. Further large scale comparative studies are necessary to assess the effect of MLD, compression & wound care versus wound care alone in L.E patients living with wounds.

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Neoprene adjustable garment for intensive therapy as an option in hospital settings

Category: Patient/care engagement or self-management initiatives

Introduction

The reality of hospital settings to address breast cancer related lymphedema (BCRL) is time constraining. Bandages are commonly used in the intensive phase of treatment in BCRL. However, they ideally need to be applied daily, which is not possible in the hospital reality.

Aim

The aim is to estimate the extent to which, in women and men with unilateral BCRL, does neoprene adjustable garment, arm exercises and self-management reduce arm volume in time restraint hospital settings.

Description

With the introduction of the neoprene adjustable garment made for the intensive and maintenance phase, the opportunity to involve the patient more in their lymphedema therapy was taken. Patients have to buy the neoprene adjustable garment at a recognized fitter. Once received, the patient is coming to our service and is taught how to don it adequately. In addition, arm exercises and self-management strategies are given. Then, the patient is seen once or every second week for the duration of the intensive therapy. When completed, the patient is fitted for a compression garment and the neoprene adjustable garment is worn during the waiting time.

Outcome

At the moment, about 15 patients tried this protocol of treatment for the intensive phase. Patients obtained a significant arm volume reduction (mean volume loss = 212.1 ml [76, 492], p-value < 0.001). They were seen on average three times before they were fitted for their compression garment.

Evaluation of impact

Patients were pleased with the neoprene adjustable garment: they could readjust it as they needed and were not limited in some daily activities, such as washing. In addition, there was a reduction of cost: less travelling for the patients and less therapist time. This suggests that neoprene adjustable garment, arm exercises and self-management strategies should be considered for BCRL treatments in hospital settings.

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ABSTRACT 1.4 – also POSTER #17

An Innovative Alternative for Compression for Truncal/Breast Lymphedema - "Born out of Frustration"

This self-management initiative was "born out of frustration" of a breast cancer survivor. She was not able to find an effective and comfortable compression top on the market to manage her truncal lymphedema. Garments available were found to be generally difficult to don and doff, uncomfortable to wear and did not address individual differences in compression needs. Custom options are expensive, not readily available, and can be very "medical-looking". As a result, we set out to design our own compression garment.

Objective: To develop a customized, affordable, comfortable and user-friendly compression garment for the trunk.

Design: Individual case study using LymphQOL measure, subjective responses to symptoms, and objective measurement of trunk circumference. Pressure devices will be used to measure compression of the garment on the chest wall and pressure exerted by different fabrics. Pre-and post-use of the garment measures will be taken at 24 hours and 2 weeks. **Patients**: Cancer-related lymphedema causing chest wall, breast, and/or trunk swelling.

Hypothesis: By constructing a custom compression garment with different fabrics and design options, patient satisfaction and compliance will be improved. We hypothesize that this will reduce lymphedema signs and symptoms. The product would be more economical than what is currently available.

Results: **Case Study 1**-Product creator- Researched various fabrics and designs to construct current customized product. Objective/subjective measures to be used on subsequent designs.
Design features:

- no seams that cause pressure points
- donning and doffing is independent with use of a front, flexible zipper
- extra compression to back of garment
- ability to add pockets for prostheses and foam/swell spots
- Cost ~$150- $195

Case Study 2: to be trialed on a second client before the conference.

Conclusion/Outcome: Garment design will be modified based on feedback and results from the case studies to improve the design and final product. The next steps include conducting a larger pilot project.

Lisa Bradley, Product creator
Lori Radke, PT, CLT, Rehabilitation Oncology Clinic, Calgary AB

ABSTRACT 1.5

Title: Efficacy of Night-time Compression for Breast Cancer Related Lymphedema (LYNC): A Multi-centre, Randomized Controlled Efficacy Trial

Introduction: Lymphedema is a prevalent long-term effect of breast cancer treatment that is associated with reduced quality of life. Observational data suggest that the addition of night-time compression to day-time use of a compression garment results in better long-term control of arm lymphedema.

Aims: The primary objective of this randomized controlled trial (RCT) is to determine the efficacy of night-time compression on arm lymphedema volume maintenance and quality of life in breast cancer survivors in the maintenance phase of lymphedema treatment.[1]

Methods: The study is a parallel 3-arm, multi-centre randomized fast-track trial. Women with breast cancer related lymphedema (BCRL) were recruited from 3 centres in Canada and randomized to Group 1: Day-time compression garment alone; Group 2: Day-time compression garment + night-time compression bandaging; Group 3: Day-time compression garment + use of a night-time compression system garment. The duration of the primary intervention period is 12 weeks. The follow-up period after the intervention follows a longitudinal observational design.

The primary outcomes include differences from baseline to week 12 in: (1) arm lymphedema volume, and (2) quality of life. Secondary outcomes include bioimpedance analysis, sleep disturbance and self-efficacy. All measurements were standardized and performed prior to randomization, and at weeks 6, 12, 18 and 24.

Results: Recruitment for the trial is complete with 120 women enrolling across the three sites. 111 women have completed the RCT portion of the study and 101 have completed the full study. Three women have withdrawn. Follow-up testing of the 16 remaining participants will be completed by July 2017. Results will be presented at the conference.

Conclusions: The use of night-time compression as a self-management strategy for chronic BCRL is an innovative approach to improve long-term lymphedema control. This trial aims to advance the knowledge on self-management strategies for lymphedema.

[1] McNeely ML, Campbell KL, Webster M, Kuusk U, Tracey K, Mackey J. Efficacy of night-time compression for breast cancer related lymphedema (LYNC): protocol for a multi-centre, randomized controlled efficacy trial. BMC Cancer. 2016 Aug 4; 16:601. doi: 10.1186/s12885-016-2648-8.

McNeely ML, Dolgoy N, Skjodt Rafn B, Al Onazi M, Ospina P, Koelwyn A, Campbell KL, Webster M, Mackey J.

ABSTRACT 2.1 & Poster presentation #19

Clinical research studies

Effect of an aquatic program on limb volume and quality of life in patients with lower limb lymphedema

Exercise has been recognised as an essential element in the management of lymphedema. We hypothesized that the physical properties of water could be used to overcome the physical and medical limitations encountered on dry land for patients with lower limb lymphedema and to encourage the participation in moderate intensity activities to reach training benefits.

Aims of study

To determine whether patients with lower limb lymphedema can benefit from training in immersion to help control /diminish limb volume and improve quality of life.

Methods

Eighteen lower limbs of 12 female participants affected by bilateral or unilateral lymphedema were included in this pilot study. Patients had primary or secondary lymphedema as complications of skin, breast or gynecological cancers. The research took place in the *Gym liquide* program, at the University of Quebec in Montreal Aquatic University training center at a water temperature of *$30^{o}C$*. Participants did a 45 min aquatic training session, twice a week, for 6 consecutive weeks. They exercised doing yoga, aqua-jogging, pedaling on a water stationary bike and muscular training on a step and a trampoline. Outcome measures were the quality of life for limb lymphedema questionnaire (LYMQOL), the 6 min walk test, the bioelectric impedance spectroscopy and limb circumference. The study was approved by the Ethics committee of the University of Quebec in Montreal.

Results

Since the research is still in progress, the anticipated results will demonstrate that limb volume was stable or significantly diminished in the affected limb; the distance covered in the 6 min walk test improved and so did the overall quality of life as determined by function, appearance, symptoms, and mood.

Conclusions

Aquatic training could facilitate access to moderate intensity activities for patients with lower limb lymphedema and optimize quality of life outcomes through exercise.

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ABSTRACT 2.2

Enseignement préopératoire et lymphœdème

Le centre des maladies du sein de l'hôpital Saint-Sacrement offre, depuis 2010, des enseignements de groupe sur le lymphœdème et les séquelles musculo-squelettiques possibles post chirurgie pour un cancer du sein. L'objectif de ces groupes étant de démystifier ces problématiques, d'agir à titre préventif et de promouvoir un dépistage et traitement précoce afin d'améliorer le pronostic fonctionnel à long terme.

Bien que ces groupes demeurent efficients et appréciés de la clientèle, un problème persistait en ce qui a trait au dépistage précoce du lymphœdème. En effet, il est difficile de diagnostiquer un début de lymphœdème alors que les études démontrent qu'une différence de volume entre les deux membres supérieurs existe chez plusieurs personnes, que ce soit d'origine anatomique ou fonctionnelle (dominance, sport). Il devient alors difficile de dépister et traiter rapidement un œdème sans avoir de mesures préopératoires afin de s'assurer que la différence de volume mesurée en post-op n'était pas déjà présente avant la chirurgie.

Depuis 2015, le département de physiothérapie a décidé de débuter des groupes d'enseignement préopératoire. Cette séance hebdomadaire d'une heure regroupe un maximum de 10 patientes qui subiront sous peu un évidement axillaire ou une mastectomie totale.

Antérieurement, un enseignement individuel sur les exercices post-chirurgie et les conseils concernant le massage des cicatrices était offert le lendemain de la chirurgie. Actuellement, en plus de nous permettre de prendre différentes mesures des bras avant la chirurgie, ces groupes nous offrent la possibilité d'optimiser cet enseignement. Les gens sont alors plus en mesure d'assimiler l'information et se voient rassurés en ayant réponses à leurs questionnements concernant la période post-chirurgicale.

Cette présentation mettra en lumière ce programme préopératoire créé en continuité avec le programme post-op déjà existant afin d'encourager différents milieux à développer de telles ressources pour les personnes à risque de développer un lymphœdème.

Mélissa Bergeron, physiothérapeute
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ABSTRACT 2.3

L'exercice c'est sûr! Mais comment?

Les exercices sont reconnus dans la littérature comme un élément important qui contribue au contrôle du lymphœdème. Dans le but d'améliorer l'autonomie des patients et leur adhésion à l'exercice, je propose un atelier avec les intervenants qui suggèrent un programme d'exercices à leurs patients.

Dans cet atelier nous explorerons des éléments contextuels dont il faut tenir compte, notamment les douleurs, les capacités et les différentes habitudes de vie des patients. Cet atelier veut sensibiliser l'intervenant à s'adapter à la réalité des patients et ainsi mieux répondre à leurs besoins.

Marie Jutras
Est physiothérapeute au Centre de Soutien au Lymphoedème de la Fondation du Cancer du Sein du Québec

ABSTRACT 2.4

Quand les professionnels s’unissent pour faire encore mieux dans la prise en charge du lymphœdème pour les patientes atteintes d’un cancer du sein

Catégorie : Développement de services pour le lymphœdème, Projet terminé

Objet : Quand les professionnels s’unissent pour faire encore mieux dans la prise en charge du lymphœdème pour les patientes atteintes d’un cancer du sein

Depuis plusieurs années, l’équipe suprarégionale traite et accompagne des milliers de patientes tout au long du continuum de soins. Afin de répondre à l’évolution des pratiques, d’optimiser la collaboration interprofessionnelle et de rejoindre un bassin de clientèle sans cesse grandissant, il s’avérait essentiel d’organiser notre offre de services dans la gestion du lymphœdème.

Différentes stratégies ont été développées pour intervenir auprès de la clientèle du cancer du sein à risque ou atteinte de lymphœdème. Le modèle de services actuel est le fruit des expériences passées, des réflexions des équipes terrain, des commentaires des patients et des exigences organisationnelles. Il s’appuie sur les fondements scientifiques et témoigne du souci d’amélioration continue.

Nicole Deschênes, Infirmière pivot en oncologie
Claudia Maltais, Physiothérapeute et thérapeute Vodder

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ABSTRACT 2.5

LE LYMPHOEDÈME À L'HEURE DES MÉDIAS SOCIAUX – PROJET DE DIFFUSION D'INFORMATION SUR FACEBOOK PAR UNE ASSOCIATION DE PATIENTS

Contexte

Considérant : 1) la popularité du Web auprès des patients en quête d'information, 2) le manque de fondement de certaines sources virtuelles s'exprimant sur le lymphœdème et 3) l'efficacité des plateformes technologies pour rejoindre des groupes aux intérêts définis; l'Association québécoise du lymphœdème (AQL) a mis à l'essai l'élargissement du mandat de sa page Facebook au-delà de l'annonce de ses propres activités.

Méthodes

Le nouveau mandat consistait à filtrer les renseignements et actualités circulant sur le Web, en identifiant les informations de valeur provenant de sources fiables et en les relayant de façon commentée sur la page de l'AQL. Un encadrement a été défini pour baliser les choix d'information. Un avis de réserve a été publié. De plus, les commentaires des internautes ont été considérés afin de préciser le rôle de la page.

Résultats

Des publications quotidiennes ont suscité un taux d'interactivité record. En 3 mois, le nombre d'abonnés a augmenté de 60 %, avec une portée atteignant 1000 à 3500 personnes. Les publications ont été partagées par d'autres associations en lymphœdème, des activistes et des groupes fermés de patients. En plus de l'objectif initial, le nouveau mandat a permis : de briser l'isolement des patients, de nourrir l'intérêt des thérapeutes, d'appeler à la participation pour la recherche, de diffuser des mises en garde pour des sujets d'actualités, d'obtenir des témoignages de patients et de sensibiliser le public à la maladie.

Conclusion

Cette expérience a mis en lumière le besoin parmi les patients d'avoir des informations validées ainsi que de former une communauté apte à s'informer et à s'éduquer. Afin d'assurer le soutien requis aux patients, les informations obtenues par cet usage élargi d'une page Facebook peuvent servir à orienter plus efficacement les activités d'une association. Des plateformes comme Instagram et Twitter demeurent à explorer.

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ABSTRACT 3.1

Effectiveness of Compression Bandaging Education for Wound Care Nurses

Compression bandaging is an essential component in the treatment of leg venous ulcers. An adequate pressure and stiffness is needed in order for the treatment to be successful. The aim of this study was to evaluate the effectiveness of a training workshop of compression bandaging amongst wound care nurses who had no prior experience in application of compression bandages, immediately post-training and six months after training. A quasi-experimental design was conducted in Maccabi Healthcare Services in which 37 nurses went through a 4-hour educational session which included practicing with a pressure device that measure sub-bandage pressure. Before training, 5.4% of nurses bandaged in the optimal range; after training, 58% bandaged in optimal range and six months after training, 37% bandaged in optimal range. At post- and six months post-training, no nurse bandaged too low (>20mmHg). Stiffness of the bandage was achieved in only 5.4% of nurses prior to training; 62% immediately after and at 75% six months after training. We conclude that the proposed educational session with the pressure device is an effective way to teach wound care nurses how to use compression bandage in their care; however, more practice is needed to achieve an optimal range of pressure over time.

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ABSTRACT 3.2

Development and Testing of the Lymphedema Symptom Intensity and Distress Survey—Lower-Limb

Introduction

Patients with lower-limb lymphedema often a report a poor quality of life and multiple health-related symptoms. A self-report tool is needed to: 1) promote identification of lymphedema related symptoms; 2) identify and target areas where intervention or education is needed; and 3) monitor treatment outcomes.

Aims

To establish the measurement characteristics of the Lymphedema Symptom Intensity and Distress Survey—Lower-Limb (LSIDS-L).

Methods

Initially, 277 individuals with lower-limb lymphedema completed a 36-item draft LSIDS-L and demographics form. In a subsequent study, 64 more individuals with lower-limb lymphedema, as well as 111 without, completed those forms and the Functional Assessment Screening Questionnaire (FASQ), Profile of Mood States-Short Form (POMS-SF), and Marlowe-Crowne Social Desirability Scale Short Form C (MCSDS-SFC). Data were collected using an electronic REDCap survey platform. Exempt status was approved by an IRB for all components. Analyses included descriptives, statistical clustering of the LSIDS-L items, group comparisons, and correlations among measure scores.

Results

Median age of all volunteers was 50.0; those with LE had a median age of 53.0. Primary lymphedema was the most common type (41.2%). Most of the respondents with lymphedema were female (87%) and white (85.9%).

Clustering of the LSIDS-L items resulted in the removal of 5 items, with the remaining 31 items clustering into 8 areas: Activity, Soft Tissue Sensation, Pain, Resources, Biobehavioral, Neurological Sensation, Function, and Sexuality. Cronbach's alphas ranged from 0.77 to 0.84. Patients with lymphedema had higher scores overall and for each of the clusters than did those without ($p < 0.001$, Cohen's d range 2.28 (soft tissue sensation) to 0.60 (sexuality)). Expected convergent validity was demonstrated with correlations with FAS-Q and POMS-SF (total and subscale scores). Divergent validity was demonstrated by negligible correlation with MCSDS-SFC scores.

Conclusions

The 31-item LSIDS-L is a valid self-report instrument for patients with lower-limb lymphedema.

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ABSTRACT 3.3

Clinical use of DXA measurements in lymphedema assessment and treatment – a pilot investigation

IN PROGRESS

Aim/Introduction

Increased fibrotic and adipose tissue that develop in chronic lymphedema post breast cancer treatment (BCRL) may affect response to components of treatment by Decongestive Lymphatic Therapy (DLT). Clinically, we rely on volume comparisons between limbs to guide treatment planning. Dual-energy x-ray absorptiometry (DXA) can assess comparative measures of fat, bone mineral and lean mass in body tissues. Where the excess volume values calculated by the truncated cone method from circumferential measures are similar or less than the excess fat volume when measured by DXA, we postulate that compression may not be an effective treatment.

Description

Fifteen women from a hospital based lymphedema clinic, with stage 2 lymphedema (12 upper limb, 3 lower) obtained DXA readings. Previous studies showed fat mass and lean mass to be significantly greater in the affected arm compared to the unaffected arm. In our group DXA showed 66% had greater fat mass in the affected limb compared to the unaffected, while 86% had greater lean mass in the affected limb. In 60% of the cases intensive treatment was suggested as excess volume measures by circumferential tape were substantially greater than excess fat volume measured by DXA.

Evaluation

DXA readings provide useful information. Patients possessing compression garments might benefit form a short intensive treatment before purchasing a new garment; however, this may not be the case when DXA measurements show the difference in excess fat is greater than the difference in excess volume between limbs. Our findings concerning differences in tissue composition between limbs continue to generate questions. Follow up DXA measurements may shed some light on the tissue changes as lymphedema progresses, facilitating the assessment and prescription of individual treatment strategies.

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ABSTRACT 3.4

The Use of Quantitative Ultrasonography to Assess Tissue Properties of Stage 2 Breast Cancer-Related Lymphedema.

Introduction: The most common ways of clinically evaluating lymphedema are through subjective inspection, palpation and circumferential measurements. Although these methods are considered to be standard in clinical assessment, they fail to adequately assess tissue properties. Thus, alternative techniques are needed to provide a comprehensive and informative clinical description of the affected limb. Ultrasound is a safe, affordable and portable method that shows promising results in identifying tissue composition and may provide clinicians with a more quantitative and objective approach to assess patients with lymphedema.

Research Objectives: The purpose of this study is to assess tissue changes through the use of ultrasound elastography and radiofrequency on patients with stage 2 breast cancer-related lymphedema (BCRL).

Research Hypotheses: Firstly, we hypothesize a significant difference in tissue thickness, echogenicity and elasticity between the affected and unaffected limbs of patients with lymphedema. On the contrary, we hypothesize no significant differences between the limbs of the healthy control women. Third, we hypothesize significant differences in tissue thickness, echogenicity and elasticity between the arms of patients with lymphedema compared to those of healthy women.

Methods: The study is a cross-sectional observational study comparing the affected and unaffected arms of 20 women with stage 2 BCRL and 20 healthy women. Primary outcome measures include tissue quality, thickness, and elasticity using quantitative ultrasound techniques. Ultrasound images will be taken at six locations across the arm; specifically, at set distances above and below the wrist, the elbow and the acromio-clavicular joint. Secondary outcome measures are body composition and bone mineral density using dual x-ray absorptiometry, arm volume measured by perometry, and handgrip strength using dynamometry.

Clinical Implications: Quantitative ultrasound and elastography techniques will provide a “window of opportunity” for health care professionals to better assess and monitor lymphedema stage and progression, as well as the results of therapeutic interventions.

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ABSTRACT 3.5

Effects of Aerobic Training and Dietary Intervention on Arm Volume and Composition in Breast Cancer-Related Lymphedema

Introduction: Breast cancer-related lymphedema (BCRL) and poor treatment prognosis are prevalent in women who are overweight or obese. Conversely, weight loss by dietary advice and low fat diets has been shown to significantly reduce BCRL. Whether aerobic training or aerobic training with dietary intervention significantly reduces arm volume is currently unknown.

Research Objective: The aim of this study is to compare the effect of 2 interventions (aerobic training / aerobic training and dietary intervention) on the volume, tissue composition and properties of the affected arm in BCRL.

Research Hypothesis: Considering the well-known effects of prolonged aerobic training and caloric restriction diets on overall body weight loss, it is reasonable to assume that after these interventions, there will also be a significant reduction of the affected arm volume in BCRL.

Methods: Thirty women with Stage II BCRL will be randomized into the following three groups: 1) aerobic training only (n=10), 2) aerobic training coupled with dietary intervention (n=10), or control (n=10). All women will be followed for 22 weeks. The primary outcome measure will be the difference in volume between the affected and unaffected arm following the two interventions. Arm volume will be determined by circumferential tape measure and perometry. Tissue composition and properties of the affected and unaffected arm will be determined by dual energy x-ray absorptiometry and ultrasound elastography techniques.

Clinical Implications: Exercise and diet have been identified as hallmarks for the maintenance of good health and weight control including those with BCRL. If these interventions are shown to be successful in reducing arm volume, this study will reinforce the need and importance for health care professionals to include these interventions as an integral part of overall treatment effectiveness.

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ABSTRACT 4.1

Understanding obesity and exploring the relationships between weight, lymphedema and cellulitis in a clinic population with lymphedema of different etiologies

Background:
There is an increasing recognition of the link between obesity and lymphedema. Obesity has been identified as a risk factor for breast cancer-related lymphedema. However, less is known about the relationship between body mass index (BMI) and lymphedema-related factors in the general lymphedema population.

Aims of study:
The aims of this study are to understand the prevalence of overweight and obesity in the lymphedema population and to explore the relationships between BMI, medical and treatment characteristics, lymphedema characteristics and cellulitis history in patients with suspected lymphedema assessed at a specialized lymphedema centre.

Methods:
Patients with suspected diagnoses of lymphedema of different etiologies are referred to our lymphedema clinic for comprehensive assessment and management. Through the use of an electronic database, patient information on demographics, body mass index (BMI) medical and treatment-related characteristics, lymphedema characteristics and cellulitis history is tracked. Over a two-year period (April 1, 2012 to March 31, 2014), 181 new patients with suspected lymphedema underwent BMI measurements during their initial visits at the clinic. Descriptive analyses will be used to characterize the patient population. Using ANOVA and correlation analyses, relationships between BMI, medical diagnosis, lymphedema etiology, lymphedema location, lymphedema severity and cellulitis history will be explored.

Results:
Results will be presented at the conference.

Conclusion:
This study will shed light on the prevalence of obesity and factors related to weight in the lymphedema population. As a modifiable factor potentially amenable to clinical management, obesity in individuals with lymphedema needs to be further explored.

Shirin M. Shallwani, Pamela Hodgson, Anna Towers
Montreal, Quebec

ABSTRACT 4.2

Preventing chronic lower leg wounds: what can health care teams and patients do together?

Introduction

Wounds in patients with chronic edema pose a challenge for health care professionals. These patients present with long standing issues of repetitive or non-healing wounds, cellulitis episodes and functional complications due to late diagnosis and lack of adequate treatment strategies. This represents a high cost to the health care system and to patients. Therefore, efforts at every level should address the causes of wounds.

Aims

1) To address the importance of a multidisciplinary approach in dealing with patients who are at risk for complex clinical wound presentations;
2) To inspire programs to prevent and manage wounds by identifying risks and adopting proper prevention and treatment modalities
3) To discuss the importance of involving patients in determining common goals

Rationale

Patient/caregiver and health care professionals (primary care physicians, community nurses, wound care nurses, lymphedema therapists) should work as a team in order to establish the best individualized treatment plan for long term success in wound prevention and management.

Description

Via interactive dialogue, the lead author, who is a lymphedema-trained occupational therapist who works in the community, will review the importance of an individualized holistic assessment. The importance of working together within our respective roles and competencies will be the main focus. Emphasis will be on involved partners to take on a more active role in patient education, in creating prevention strategies and effective wound treatment options.

Evaluation

Participants will obtain a better understanding of each person’s role in the prevention of wounds and develop an attitude of dialogue and collaboration in improving wound care in general.

Lina Demanins, Marie-Eve Letellier, Dr. Anna Towers
Montreal, Quebec

Abstract 4.3

The importance of having an INTERDISCIPLINARY team to treat lymphedema pediatric patients

Patients with lymphedema may present complex clinical problems with lesions sufficiently severe to require the intervention of an interdisciplinary team to ensure diagnosis, treatment and proper follow-up.

Primary lymphedema may be linked with other physical conditions such as: capillary, venous, lymphatic and arterio-venous malformations, genetic syndromes such as, Pik3CA related overgrowth syndromes (PROS) and others such as Turners, Noonans, Tuberous sclerosis. It is important to be followed by a team with a certified lymphedema therapist.

CHU Sainte-Justine is a tertiary pediatric center that has the only program in Canada treating lymphedema in babies, children and teens.
Our vascular anomalies team consist of multiple medical and surgical specialties as well as a psychologist, a social worker, a clinical nurse and a specialized certified physiotherapist.

Lymphedema is a long lasting (chronic) condition, which worsens if not treated. There is no cure, but treatment can help move the lymph and reduce or prevent swelling, as well as cellulitis. The expert working with these children has to teach them and their family how to manage at home. Here the “Patient as Partner” approach is essential. This approach involves the patients in their own care.

Parents and caregivers need to be fully educated, intimately involved in monitoring and managing the symptoms and signs of lymphedema and its secondary complications.

They should also encourage the child to practice proper self-management techniques. They will need to learn this as a lifelong skill.

Parents need to actively encourage and support the child’s participation in normal physical activity and they need to provide strong emotional and psychological support to their child.

Sandra Ondrejchak, RN., Catherine McCuaig, md., Chantal Lapointe BSc, PT, Raymond Lambert, md, Sophie Turpin, md, Josée Dubois, md
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ABSTRACT 4.4

Parents Raising Children with Primary Lymphedema: Preliminary Study Results

The experiences of parents of children with Primary lymphedema (LE) have received limited research attention despite parents' vulnerability for experiencing feelings of helplessness, frustration, grief as well as high levels of stress and depression (Kepteotes, Keatinge, & Stone, 2010; Todd, 2015). Parents' experiences of excess stress can lead to negative mood and child behavioral problems (Miodrag, Berke, Tanner-Smith, & Hodapp, 2015). Thus, this study aimed to gain in-depth understanding of the lived experiences of these parents. Data were collected from parents of children with LE using both surveys (N = 30) and semi-structured interviews (N= 22). The surveys included reporting the child's symptoms, activities of daily living, and psychological distress as well as parents' psychological stress. Semi-structured interviews focused on parental challenges, parental advocacy for their child, how parents explain and teach their child to explain LE, and their support and coping mechanisms.

Participants were between 25 and 64 years of age, predominantly white (n=29), female (n=27), and college educated (70%). Participants were from Canada, US, UK, New Zealand, Australia, South Africa, Ireland, and Bosnia and Hercegovina. Roughly 67% of participants' children were diagnosed with LE before they were two years old. The majority of the children (66.7%) were affected by LE in their legs while the others were affected in their genitals, both of their feet and hands, their face, chest, or their full body.

Four themes were identified from the interviews: medical professionals' lack knowledge of LE that can lead to experiences of misdiagnosis and parents feeling frustrated, the important role that social support can play for families coping with LE, difficulty finding and keeping pediatric LE therapists for their children, and families experiencing financial and insurance struggles.

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Mary Martin, Social Work, Miami University; Lindsay Clark, Biology, Miami University; Lauren Ramsey, Biology, Miami University; Alyssa Oddo, Social Work, Miami University; Meghan Day, Biology, Miami University; Danielle Jones, Public Health, Miami University; Kristie Cordeiro, Biology, Miami University

ABSTRACT 4.5

The Meaning of Success of Lymphedema Management: A Qualitative Study

Background

Lymphedema is a chronic disease, which requires a lifelong management. Complex Decongestive Therapy is the recommended treatment which consists of intensive and of long term management phases. The goals of treatment can be different for the therapist or the person who lives with lymphedema. No study has examined the perception of treatment success of those who experience lymphedema. Therefore, the aims of the study were to *understand what people with lymphedema consider to be the meaning of success in the intensive phase and in the long-term phase of lymphedema management.*

Method

The biopsychosocial model for lymphedema was used as a conceptual framework for this study. A phenomenological method, with semi-structured interviews and open-ended questions, were applied. Purposeful sampling was used to find people who suffer from lymphedema of different etiologies, stages, and severities. The interviews were conducted in the long- term management phase for each participant. Content analysis was conducted using value and affective method for the first cycle coding and axial coding for the second cycle. The most common themes that emerged from the data were hope, un-clarity as to moving to the long phase of treatment, empowerment and maintenance vs. back to normal (acceptance vs. hope).

Conclusion

Before the intensive phase of treatment, success means disappearance or improvement of the swelling, pain and better function; in the maintenance phase success was stability and not getting worse but also, for some participants, disappearance of the swelling.

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2017 | Congrès national du lymphœdème
National Lymphedema Conference

Abstracts

Poster Presentations

POSTER #1

Case Study: Progressive Widespread Edema After Thoracic Duct Injury

Context

This case describes the unusual presentation and conservative management of a 62-year old woman with widespread edema after treatment for persistent bilateral chylothorax from a thoracic duct injury. While previous decortication with pleurodesis had improved the chylothorax and respiratory symptoms, subsequent progressive edema decreased the patient’s mobility and quality of life. Shortness of breath and pain complicated the management of the lymphedema.

Objective and Setting

The challenging treatment of this unusual case in a private practice setting is presented and discussed.

Methods

The patient was treated with a customized combined decongestive therapy (CDT) regimen. Consent for publication of this case was obtained from the patient.

Results

CDT was able to halt and reverse the progressive weight gain from lymphedema and significantly improved pain and shortness of breath.

Conclusion

Early intervention with CDT must be implemented at the onset of lymphedema after thoracic duct disruption.

The author declares no conflict of interest.

Sonja Redden
Prince George, BC

POSTER #2

Characterization of Skeletal Muscle Architecture and Quality in Breast Cancer-Related Lymphedema

Introduction

Women with breast cancer-related lymphedema (BCRL) suffer significant dysfunction and weakness of the affected arm. Although potentially mediated by pain, alterations in skeletal muscle architecture and quality could partially explain the functional decrements. At present, no study has established definitive changes in these muscle properties. Our team has demonstrated that ultrasonic detection of minute modifications in tissue properties can be significantly enhanced through the use of elastography and quantitative ultrasound techniques.

Research Objectives

We will quantitatively evaluate and compare changes in skeletal muscle architecture/quality in the ipsilateral and contralateral arms of women with unilateral *Stage II* BCRL. Comparative differences in muscle architecture/quality will be made between BCRL patients, breast cancer survivors without lymphedema and healthy controls.

Hypothesis

We hypothesize there will be significant differences in all muscle architecture and quality parameters between ipsilateral and contralateral arms of BCRL group. Furthermore, this reduction will be significantly different relative to both cancer survivors without lymphedema and healthy control groups.

Method

Thirty female participants will be recruited as three age-matched groups: Stage II BCRL (n=10), healthy breast cancer survivors (n=10) and healthy controls (n=10). Participant assessments will include arm circumference by tape measure, volume by perometry and handgrip strength by dynamometer. Subsequently, parameters of skeletal muscle architecture (e.g. muscle thickness, fascicle length, pennate angle, cross-sectional area) and quality (e.g. strain/hardness) will be assessed concurrently by B-mode and ultrasound elastography, respectively. Measures will be taken at the level of the forearm flexors, extensors, biceps and triceps brachii.

Clinical Implications

Characterizing skeletal muscle abnormalities within lymphedematous arms would provide rehabilitative professionals the necessary information for targeting their therapeutic strategies to improve muscle function, strength and ultimately quality of life. Furthermore, muscle architecture analysis may provide clinicians with an objective criterion for assessing the severity of BCRL. *Supported by the Dr. Louis G. Johnson Foundation*

A. Thorburn’[2,3], J. Whyte[1,2,3], S. Fallone[1,2,3], A. Towers[2], H. Rivaz[4,5], R.D. Kilgour[1,2,3,5]
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Decongestive Resistance Exercise with Advanced Compression for Breast Cancer Related Lymphedema Management (DREAM): A Protocol for a Randomized Controlled Trial

Background

More than one in five women who survive breast cancer will eventually develop lymphedema. Recent studies in breast cancer lymphedema management have demonstrated that resistance exercise can improve the survivors' quality of life without exacerbating their lymphedema. However, research has not yet considered other elements of the lymphedema management regimen that may promote arm volume reduction. Using both compression and the decongestive exercise sequence in a progressive resistance exercise program has the potential to improve not only survivors' quality of life, but also their arm lymphedema volume.

Objective

A randomized controlled pilot trial will be conducted to investigate the feasibility and preliminary efficacy of combining these components to improve arm lymphedema volume and survivors' quality of life. The secondary objective is to evaluate shoulder function, physical activity level, and health related quality of life.

Methods

Twenty-four to thirty women with stable breast-cancer-related lymphedema will be recruited through the Cross Cancer Institute and University of Alberta and randomly assigned to one of the following three groups: (i) Standard care: day time compression only, (ii) Decongestive Progressive Resistance Exercise (DPRE) plus use of a daytime compression sleeve during exercise, and (iii) DPRE plus use of an adjustable compression wrap garment during exercise. Ethical approval has been obtained from the Health Research Ethics Board of Alberta.

Data analysis

One-way ANOVA will be used to compare the outcome measures of the three groups and to inform point estimates and measures of variability.

Results

We anticipate that using a combined DPRE program with or without AC will be feasible and will reduce arm lymphedema volume. We also anticipate that this combined program will improve arm function, body image, and quality of life. Preliminary results will be presented. ***Conclusion:*** This pilot study will form the basis of a future large scale multi-center randomized trial.

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DiSipio, T., Rye, S., Newman, B., & Hayes, S. (2013). Incidence of unilateral arm lymphoedema after breast cancer: a systematic review and meta-analysis. *The lancet oncology*, *14*(6), 500-515.

POSTER #4

Don’t reject the kidney transplant patient

Context

This is a case of a 40-year old, life-long renal disease patient, who, after a third kidney transplant, developed secondary lymphedema in her abdomen, pubic/genital areas and left leg. It is of importance because many therapists might erroneously assume it is a dynamic edema and refuse to provide therapy. Three kidney transplants, four hernia surgeries, and peritoneal dialysis up to ten years at a time have compromised this patient's lymphatic system. In this case, the kidney is functioning, and unilateral leg edema is characteristically secondary. It is also important that the nephrologist recognized that the swelling was not the typical post-surgical nor renal-failure swelling. Early-intervention lymphedema education and therapy were key in minimizing the impact of lymphedema on the transplant patient’s permanently compromised immune system and thus minimizing the impact on the health care system.

Objective

To show that lymphedema education, treatment and management options, while navigating the complications that arose post-kidney transplant surgery, were successful and that the kidney transplant patient should not be denied therapy on the assumption that “kidney” = “dynamic edema”.

Setting

Therapy was provided by a Dr. Vodder-trained MLD/CDT, LANA-certified remedial massage therapist. Treatments took place in a private-practice clinic in Winnipeg (Canada).

Methods

Manual lymph drainage, lymph taping, combined decongestive therapy, lymphedema exercises and compression garments were used.

Challenges

Several medical complications arose which impacted the course of lymphedema therapy and modifications were necessary.

Conclusions

Certified lymphedema therapists should recognize that not all kidney-related swelling is dynamic. This transplant patient’s quality of life was greatly improved with MLD/CDT, as left leg volume decreased by 1,500ml to almost normal and she now follows Best Practices for lymphedema management. Challenges and modifications will be discussed.

Katherine Styrchak, RMT, CLT-LANA Winnipeg, MB

The Abstract Submission Guidelines do not stipulate that the case must be a "new", or "never presented before" case, and you should be informed that I have presented this case study at the Asia Pacific Lymphology Conference in Darwin in May 2016. I believe it is an important case that should be shared with MLD therapists everywhere.

POSTER #5

Effects of targeted exercise program on time course of upper limb function post radiotherapy in young adults with breast cancer: a pilot randomized control trial

Background

Disease and treatments are aggressive in young women diagnosed with breast cancer. In addition, diagnosis in young adults is rising. The evidence are now supporting the use of physical activity in order to reduce functional loss, as BC survivors commonly develop shoulder dysfunction after their treatments.

Aims of study

The aim of this pilot study was to estimate the extent to which, in young adults diagnosed with breast cancer, the effectiveness of a 12-week post-radiation exercise program, compared to standard care, in minimizing upper extremity dysfunction.

Methods

Participants were randomized to either an exercise program or standard care (control). Data was collected over six time points (pre-radiation treatment to 18 months post-radiation) using: the Disability of Arm, Shoulder, and Hand questionnaire (DASH); the Metabolic Equivalent of Task-hours per week (MET-hours/week), and a post-hoc questionnaire on return to work.

Results

59 young women were involved in the study (n = 29 exercise; n = 30 control). No statistically significant differences were found in overall DASH results between groups; however those who underwent total mastectomy had residual upper limb dysfunction ($p < 0.05$). Both groups returned to pre-diagnosis activity levels by 18 months. Final evaluation showed that 86% of the women returned to work, and 89% resumed prior work activities with a decrease of 8.5 hours/week.

Conclusion

Little is known regarding the return to work capacity after breast cancer treatment. Our pilot study found that the majority of participants returned to work, however not returning to pre-diagnosis work hours. In addition, timing and program specificity may require consideration of tissue healing as no effect on upper limb function were found.

Marize Ibrahim[1], Thierry Muanza[2], Nadia Smirnow [1], Warren Sateren[6], Beatrice Fournier[1], Petr Kavan[3], Michael Palumbo[4], Richard Dalfen[5], and Mary-Ann Dalzell[1]

POSTER #6

Identifying Training-Induced Changes in Tissue Properties and Muscle Architecture in Breast Cancer-Related Lymphedema Using Quantitative Ultrasound

Introduction:

Breast cancer-related lymphedema (BCRL) decreases functional capacity in the affected arm. Changes in tissue properties and skeletal muscle architecture could partially explain the overall loss of arm function. Furthermore, specially designed arm training programs may improve function by altering tissue properties and inducing changes in muscle architecture.

Research Objective: We will evaluate the changes in skeletal muscle properties and architecture following an upper limb training intervention.

Research Questions: Will the functional capacity improve in BCRL and will training affect tissue properties and muscle architecture? **Research Hypothesis:** We hypothesize that muscles affected by BCRL will have reduced capacity to improve when compared to healthy individuals.

Methods: Quantitative ultrasound techniques to assess tissue properties (e.g. strain/hardness) and muscle architecture (e.g., muscle thickness, fascicle length, pennate angle, cross sectional area) and quality will be assessed concurrently by B-mode and ultrasound elastography, respectively. Measures will be taken at the level of the forearm flexors, extensors, biceps and triceps brachii. Ten women diagnosed with unilateral stage 2 BCRL and 10 women without lymphedema will participate in an 8-week, 3 days per week, forearm exercise intervention. The subjects will perform a simple gripping exercise using a hand trainer for 3 sets of 12 repetitions. A 2 x 2 ANOVA (groups x time) will be used to determine if differences exist between groups. Other measurements include bilateral arm composition (DXA); arm volume (perometry) and grip strength (handgrip dynamometry).

Clinical Implications: Current BCRL management consists of patient education regarding lifestyle changes which include: healthy eating habits, daily physical activity and self-monitoring for limb volume changes. This study hopes to give individuals with BCRL additional tools to improve quality of life via specific exercise to strengthen and increase usage of affected limbs.

J. Whyte[1,2,3], A. Thorburn[1,2,3], S. Fallone[1,2,3], A. Towers [1,2], H. Rivaz[4,5], R. D. Kilgour[1,2,3,5]

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Supported by the Dr. Louis G Johnson Foundation

POSTER #7

Incidence and risk factors of arm lymphedema following breast cancer treatment at Komfo Anokye Teaching Hospital, Kumasi, Ghana

Purpose/objective

To determine the incidence and risk factors of lymphedema after breast cancer treatment at the oncology unit of KATH, Kumasi, Ghana between 01 January 2005 to 31 December 2008.

Methods

Breast cancer and lymphedema-related variables were collected from the medical records of breast cancer patients. Data were analyzed using descriptive statistics and chi-square tests.

Results

Among 313 patients treated for breast cancer between 2005 and 2008, 31 (9.9%) developed lymphedema after treatment. A chi-square test showed that axillary lymph node dissection was statistically a significant risk factor of lymphedema (Chi-square test value=7.055, P value=0.008). Radiation and late stage of breast cancer diagnosis may have contributed to development of lymphedema, despite having P value > 0.05. Age, BMI, and hypertension were also not associated with lymphedema.

Conclusion

This study provides evidence that the incidence of lymphedema was 9.9% with axillary lymph node dissection as a statistically significant risk factor of lymphedema.

Implication for practice

With the majority of breast cancer patients presenting with late-stage disease and also undergoing axillary lymph node dissection, lymphedema will continue to be a problem in Ghana. Knowing the incidence and risk factors of lymphedema not only helps in the early detection and effective management of lymphedema, but also provides base-line data for further research on lymphedema in Ghana.

Keywords: Breast cancer; surgery; axillary; lymph node dissection; radiation; lymphedema; incidence; risk factors.

Authors: Miriam Owusu Sekyere, RN, MN, OCN, Petro Basson (PHD), Corrie Uys, MS,
Jane M. Armer, PHD.

POSTER #8

TITLE: Is a 90-minute weekly water-based exercise enough to control swelling in gynecological cancer survivors living with secondary lymphedema?

STATE
Ongoing

ABSTRACT:

In the last few years, many studies have shown that water-based physical exercise can improve ROM and functionality in secondary lymphedema patients. Nevertheless, most of these studies are solely focused on breast cancer and upper limb lymphedema. The present study focuses on gynecological cancer-related lower limb lymphedema. The hypothesis of this study case suggests that water immersion properties like buoyancy and hydrostatic pressure can be effective to control swelling, heaviness, discomfort and can also facilitate daily activities. Limb volume was measured using the limb circumference. Measurements were taken before and after each session to ensure that the intervention does not worsen the swelling. Symptoms, body image/appearance, function, and mood were measured using a validated LymQol questionnaire.

The participant performed a specific exercise program twice a week unsupervised and once a week supervised by a certified lymphedema therapist and kinesiologist. Water temperature was set between 28 and 30 degrees Celsius. The results of the study suggest that participants living with secondary lower limb lymphedema who are physically active and perform a 30- minute 3 times a week water-based exercise sessions (immersion up to the xyphoïde process) (stage 1, 2 and early stage 3) can control the swelling and improve their quality of life. This study case suggests that further evidenced- based and more statistically strong studies are needed.

AUTHOR: Azlag Tarik : A.T

Is left-sided lower limb lymphedema more prevalent than right-sided lymphedema? Findings from a lymphedema clinical database review

Introduction

There is little literature that compares the prevalence of either right or left leg lymphedema volume excess in patients with lower limb lymphedema (LLL). To our knowledge, there is no study with the normal population to set standards for right and left leg volume variances linked to hand dominance.

Aims

1) Controlling for dominance, to compare the left/right lower limb volumes of right handed patients with LLL
2) To theorize on possible anatomical reasons for a preponderance of left leg volume excess

Method

McGill University Health Centre institutional approval for reporting a chart review is pending. We reviewed the electronic records of right-handed LLL patients of our hospital-based Lymphedema Clinic to determine the prevalence of left/right lower limb volume excess. Volume was calculated from circumferential measurements of 7 points along the limb using a truncated cone formula.

Results

Of the 480 records reviewed, 326 were eliminated because of incomplete data, a metastatic diagnosis, and any other diagnoses or injury/interventions with a priori impact on laterality. Although we might expect right leg circumferential volume measurements to be greater than left, preliminary results show that of N = 154 patients with LLL, 63% had greater left leg volumes compared to right. Further analysis is ongoing. Theoretically, anatomical factors, such as mild forms of May-Thurner syndrome (iliac vein compression syndrome) may explain the preponderance of left leg lymphedema.

Conclusion

The results of this database review may add to the limited literature that suggests that left leg lymphedema may be more prevalent, for anatomical reasons. The findings, if corroborated in future studies, may help practitioners in discussing prevention options for patients at risk.

Lina Demanins, Georgina Cama, Anna Towers, Pamela Hodgson
McGill University Health Centre, Montreal, Quebec, Canada

POSTER #10

Management of lymphatic filariasis: a case study from Quebec

Introduction

This case study shows how Combined Decongestive Therapy (CDT) was successful in achieving limb volume reduction, improving skin condition and leg function in a 47-year-old male with lymphatic filariasis.

Reason

Few articles address the management of lymphatic filariasis in the Canadian context. With the increased influx of immigrants and refugees, more cases may need our services. Health care professionals will realize the value of a multidisciplinary team approach and its important role in achieving successful CDT results.

Case description, with patient consent

Mr. C was originally diagnosed with lymphatic filariasis of the left leg in 2006 in the Philippines where he had undergone debulking surgeries as the only treatment. In 2016 he was referred to the Lymphedema Clinic of the McGill University Health Centre, where he was found to have severe stage 3 lymphedema of the left leg and foot. A treatment plan was elaborated and CDT was begun on a volunteer basis by a lymphedema-trained occupational therapist.

Results

Volume was calculated from circumferential measurements at 7 points along the limb using a truncated cone formula. Prior to starting CDT, there was an overall excess volume difference of

170.6 % between the left lymphedema leg and right non-affected leg. After the initial three months of CDT sessions using a Velcro-type device for compression and bandaging with short stretch bandages there was a 71.6% excess volume difference between the left and right leg. Equally noted were softened fibrotic areas, improved skin condition and function of the left leg. CDT is ongoing.

Discussion

Patients with lymphatic filariasis may present with complex clinical portraits with unique lymphedema management concerns and issues. The involvement of allied health professionals, patient/caregiver and other dedicated persons all working as a team is needed to address the multifactorial aspects of these challenging cases.

Lina Demanins, Anna Towers
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POSTER #11

Titre : Marche nordique adaptée pour le lymphoedème

Catégorie : Exercices; nouveaux développements/tendances ayant une incidence sur le lymphoedème

Introduction

La marche nordique est une activité physique facile à apprendre, plaisante et qui est en plein essor. Elle a l'opportunité de pouvoir s'adapter facilement en fonction de différentes conditions physiques et/ou médicales. De plus, les gens qui la pratiquent démontrent d'importants bénéfices sur leur qualité de vie.

Objectifs

Proposer aux personnes atteintes de lymphoedème des cours de marche nordique adaptée. Spécifiquement : 1) Combiner la technique propre à la marche nordique avec des intervalles d'exercices spécifiques au lymphoedème, 2) Respecter une réadaptation lente et progressive afin d'optimiser la réadaptation suite aux traitements pour un cancer, et 3) Individualiser la pratique de la marche nordique au stade de réadaptation du participant.

Description

La marche nordique procure un entrainement corporel complet alliant la marche et l'utilisation de bâtons spécialement conçus pour cette d'activité. L'utilisation des bâtons contribue à développer la force musculaire des membres supérieurs (tronc et bras). Chez les personnes atteintes de lymphoedème il a été démontré qu'il n'y avait aucune aggravation du lymphoedème, que les personnes retrouvent leur autonomie et améliorent leur posture ainsi que leur qualité de vie.

Implication

La marche nordique est un exercice physique complet ayant d'importants bénéfices sur la santé. En participant à une série de cours donnés par un instructeur certifié, il sera possible d'adapter l'exercice à sa condition physique. Une fois bien maitrisé, l'exercice peut se réaliser dans différentes réalités (quotidien, nature, voyage).

Conclusion

Dès notre plus jeune âge nous apprenons tous à marcher. En ajoutant des bâtons à ce mouvement naturel cela contribue à une meilleure posture et permet de gagner en stabilité. La marche nordique permet ultimement d'avoir un meilleur contrôle pour la gestion du lymphoedème.

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POSTER #12

Minimal clinical important difference: Measures of Limb Volume Change in Persons at Risk for and Living with Lymphedema: A Reliability Study

Abstract: Understanding whether a true change has occurred during the process of care is of utmost importance in lymphedema management secondary to cancer treatments. Decisions about when to order a garment, start an exercise program, and begin or end therapy are based primarily on measurements of limb volume, based on circumferences taken by physiotherapists using a flexible tape. This study aimed to assess intra-rater and inter-rater reliability of measurements taken by physiotherapists of legs and arms with and without lymphedema and to evaluate whether there is a difference in reliability when measuring a healthy *versus* a lymphedematous limb. The intra-rater reliability of arm and leg measurements by trained physiotherapist is very high (scaled standard error of measurements (*SEM*s) for an arm and a leg volume were 0.82% and 0.64%, respectively) and a cut-point of 1% scaled *SEM* may be recommended as a threshold for acceptable reliability. Physiotherapists can rely on the same error when assessing lymphedematous or healthy limbs. For those who work in teams and share patients, practice is needed in synchronizing the measurements and regularly monitoring their inter-rater reliability.

Dorit Tidhar [1,*], Jane M Armer [2], Daniel Deutscher [1], Chi-Ren Shyu [3], Josef Azuri [4,5] and Richard Madsen [6]

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POSTER #13

Reduce the risks of developing an upper limb dysfunction with the implementation of a pre-operative program

Category: Service development/enhancement initiatives

Introduction

Following breast cancer, up to 60% and more of women experience psychological and/or physical (e.g. lymphedema, limited range of motion, pain) dysfunction(s). The Kinesiology clinic (Breast Clinic, McGill University Health Center) has been offering education and specialized services for physical dysfunction for almost a decade. Women are followed starting approximately six weeks post-surgery and for a minimum of two years. However, the importance of following them earlier has been demonstrated.

Aims

The global aim of this project, granted by the Quebec Breast Cancer Foundation (1 Million to Help Contest), is to establish a pre-operative assessment program. More specifically: 1) Evaluate pre-operatively to provide a better continuum of care, 2) Early detection of women at higher risk of developing physical dysfunction following breast cancer treatments, and 3) Teach management and risk reduction strategies.

Description

It is known that a woman presenting preoperative dysfunction will be more likely to have persistent/worsened condition post-surgery. Hence, it is important to target them before any treatment is done. Based on the latest scientific evidence and on the prospective surveillance model (Stout et al. 2012), the actual post-operative program will be enhanced with the pre-operative assessment, starting in May 2017.

Evaluation

The program's effectiveness will be assessed by compiling data on the incidence of dysfunction and their improvement over time and will be compared with available literature. Patients will also be asked to fill out a questionnaire regarding their satisfaction on the given information and its relevance.

Conclusion

Early assessment of women, as early as pre-surgery, falls within the continuum of care. This allows for rapid and effective intervention to treat dysfunctions, which ultimately maximizes women's quality of life. This can also eventually reduce the burden on the Health care system.

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POSTER #14

Relationships Among Cytokines, Lymphedema, and Fibrosis in Head and Neck Cancer Patients

Introduction

Lymphedema (LE) and fibrosis (F) are present in almost 90% of patients who experience head and neck cancer (HNC). Little is known about the underlying biological mechanisms contributing to their development.

Aims

To examine potential inter-relationships of Tumor Necrosis Factor-Alpha (TNF-α), Tumor Growth Factor-Beta (TGF-β), Interleukin-6 (IL-6), Interleukin-(IL-8), Interleukin-10 (IL-10), Matrix metalloproteinase 2(MMP2) and Matrix metalloproteinase 9 (MP9), and C-Reactive Protein (CRP) with lymphedema/fibrosis in HNC patients.

Methods

With Institutional Review Board permission, patients newly diagnosed with Stage II or higher HNC were assessed for the presence/stage of external/ internal lymphedema and/or fibrosis prior to treatment, end-of-treatment, and 6, 12, 18, 24, 30, 36, 42, 48, 60, and 72 weeks post-treatment. Cytokine assessments were also conducted similarly via blood samples. 83 patients contributed data for the analyses. Group-based trajectory modeling generated groups of patients with similar longitudinal biomarker and LE-fibrosis trajectories. Area under the curve (AUC) values were also generated for each biomarker and severity of LE-F. Associations among the cytokine and LE-F trajectories and AUCs were tested (log-likelihood Chi-Square, correlations).

Results

The strongest evidence for the inter-relationships of cytokines with the overall and trajectory patterns of the severity of LE-F was observed for IL-6, IL-1β, TNF-α, TGF-β1, and MMP-9 (all $p<0.05$). Convergence of joint trajectory patterns and AUC were observed IL-6 with all LE-F trajectories and internal LE AUC. IL-1β trajectories converged with external-LE trajectories and all LE-F AUCs. TNF-α and TGF-β1 converged most strongly with fibrosis in terms of trajectory patterns however TNF-α demonstrated stronger associations LE-F AUC (fibrosis: r_s=0.49). MMP-9 while not demonstrating statistically significant joint associations with LE-F in terms of longitudinal trajectories, did demonstrate convergence with LEF AUCs (lymphedema:0.43-0.42; fibrosis: 0.35.

Conclusion

Pro-inflammatory processes likely contributes to the development of lymphedema/fibrosis in HNC patients. The processes continues well-past end of treatment.

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POSTER #15

Secondary lymphedema: assessing radiation therapists' knowledge of risk factors and current practices regarding prevention

This study assessed the radiation therapists’ knowledge of secondary lymphedema risk factors and investigated the current lymphedema preventative strategies used in four different Ontario cancer centres specific to breast cancer patients. The onset of secondary lymphedema has been reported as early as following surgery and as late as years post-treatment. Radiation therapists often come into contact with this group of patients early into their treatments. Given this fact, the radiation therapists' involvement in secondary lymphedema prevention and early referrals to physiotherapy/lymphedema specialist is beneficial for patient outcomes, hence their contribution could improve those patients' quality of life and reduce costs for the hospital. A cross-sectional design was used to obtain data from 36 radiation therapists. The participants were asked to complete an online survey about their knowledge of secondary lymphedema risk factors and the current prevention practices they use within their radiation therapy department. This study found that therapists believed obesity and radiotherapy to the axilla highly contributed to breast cancer patients’ risk of developing lymphedema. Furthermore, therapists accurately recognized the early signs of lymphedema as swelling, tightness, and heaviness of the at-risk limb, and recommended a referral to physiotherapy as well as wearing a compression garment as preventative measures. Lastly, the therapists’ perceived referral rate to physiotherapy from their department (41%) exceeded the true rate (30%).

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POSTER #16

Ultrasound Elastography of Stage 2 Breast Cancer-Related Lymphedema

Introduction

Lymphedema is usually assessed through manual palpation of the affected limb, which can be subjective and is further limited to superficial structures. Ultrasound can be used to image deeper structures below skin up to several centimeters and has been proposed for diagnosis of lymphedema. However, ultrasound imaging does not provide elasticity of the tissue, which clinically has been used as a biometric for diagnosis. Ultrasound elastography is an emerging imaging technique that provides mechanical properties of tissue and may therefore be clinically useful in the diagnosis and staging of lymphedema.

Research Objectives

The purpose of this study is to develop novel ultrasound elastography techniques for assessment of stage 2 breast cancer-related lymphedema (BCRL).

Research Hypotheses

Our first hypothesis is that skin, subcutaneous fat and muscle layers can be clearly delineated based on their mechanical properties from our novel elastography imaging technique. Our second hypothesis is that strain ratio between different structures can be reliably obtained from elastograms.

Methods and Outcomes

We model tissue deformation using a 2D affine transformation to calculate an approximate initial displacement. In this study, a novel technique for time-delay estimation of RF data will be employed to estimate the strain images. Since 2D affine transformation has only six degrees of freedom, it can be efficiently estimated by minimizing a quadratic function. Afterward, regularized global cost functions are optimized to refine the displacement map. The affected and unaffected arms of 4 women with stage 2 BCRL and 4 healthy women will be compared. Our preliminary results show that skin, fat, and muscle can be delineated in elastograms, and reliable strain ratio can be obtained from different structures.

Clinical Implications

Strain imaging of ultrasound elastography can be used to predict dynamical measurements of the lymphedema in order to diagnose and monitor the stage of lymphedema and assess treatment effectiveness.

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POSTER #17 & ABSTRACT 1.4

An Innovative Alternative for Compression for Truncal/Breast Lymphedema - "Born out of Frustration"

This self-management initiative was "born out of frustration" of a breast cancer survivor. She was not able to find an effective and comfortable compression top on the market to manage her truncal lymphedema. Garments available were found to be generally difficult to don and doff, uncomfortable to wear and did not address individual differences in compression needs. Custom options are expensive, not readily available, and can be very "medical-looking". As a result, we set out to design our own compression garment.

Objective: To develop a customized, affordable, comfortable and user-friendly compression garment for the trunk.

Design: Individual case study using LymphQOL measure, subjective responses to symptoms, and objective measurement of trunk circumference. Pressure devices will be used to measure compression of the garment on the chest wall and pressure exerted by different fabrics. Pre-and post-use of the garment measures will be taken at 24 hours and 2 weeks. **Patients**: Cancer-related lymphedema causing chest wall, breast, and/or trunk swelling.

Hypothesis: By constructing a custom compression garment with different fabrics and design options, patient satisfaction and compliance will be improved. We hypothesize that this will reduce lymphedema signs and symptoms. The product would be more economical than what is currently available.

Results: **Case Study 1**-Product creator- Researched various fabrics and designs to construct current customized product. Objective/subjective measures to be used on subsequent designs.
Design features:

- no seams that cause pressure points
- donning and doffing is independent with use of a front, flexible zipper
- extra compression to back of garment
- ability to add pockets for prostheses and foam/swell spots
- Cost ~$150- $195

Case Study 2: to be trialed on a second client before the conference.

Conclusion/Outcome: Garment design will be modified based on feedback and results from the case studies to improve the design and final product. The next steps include conducting a larger pilot project.

Lisa Bradley, Product creator
Lori Radke, PT, CLT, Rehabilitation Oncology Clinic, Calgary AB

Community Organizations Can Drive Change

Presentation Objectives:
- Provide a Canadian and global perspective of the work being done in lymphedema community based organizations
- Showcase the changes that are evolving when dedicated and passionate volunteers work together to develop long term strategies
- Encourage conference delegates to become involved in the CLF or provincial association to help drive change

Context: The momentum started in 2002 with the inception of the International Lymphoedema Framework, a global platform for the lymphedema community. There are now eleven countries currently with dedicated frameworks, united in their vision to change how lymphedema is diagnosed, treated and reimbursed around the globe. Canada was the third country to come onboard (2009) with the launch of the Canadian Lymphedema Framework. There are also seven provincial associations supporting the Canadian lymphedema community.

Joint Vision of all lymphedema based community organizations:
- Raise the profile of lymphedema
- Place lymphedema and its management as a priority on health care agendas
- Lobby for financing of reimbursement of care and address issues of inequality of provision
- Improve the lives of lymphedema suffers worldwide – the patient is at the heart of everything we do
- International collaboration is essential – among academics, health professionals, community organizations, industry and patients

Key Initiatives:
ILF - LIMPRINT epidemiology project and Canada's involvement on this research project
CLF – The focus on EDUCATION tools for health professionals and patients, RESEARCH agendas and initiatives and PARTNERSHIPS
PROVINCES – advocacy successes for reimbursement and awareness initiatives

Conclusion: Every Contribution Counts. It is the work of volunteers who are helping to change the face of lymphedema in Canada

Kennedy A, Executive Director, Canadian Lymphedema Framework

POSTER #19 & ABSTRACT #2.1

Clinical research studies

Effect of an aquatic program on limb volume and quality of life in patients with lower limb lymphedema

Exercise has been recognised as an essential element in the management of lymphedema. We hypothesized that the physical properties of water could be used to overcome the physical and medical limitations encountered on dry land for patients with lower limb lymphedema and to encourage the participation in moderate intensity activities to reach training benefits.

Aims of study

To determine whether patients with lower limb lymphedema can benefit from training in immersion to help control /diminish limb volume and improve quality of life.

Methods

Eighteen lower limbs of 12 female participants affected by bilateral or unilateral lymphedema were included in this pilot study. Patients had primary or secondary lymphedema as complications of skin, breast or gynecological cancers. The research took place in the *Gym liquide* program, at the University of Quebec in Montreal Aquatic University training center at a water temperature of $30^{o}C$. Participants did a 45 min aquatic training session, twice a week, for 6 consecutive weeks. They exercised doing yoga, aqua-jogging, pedaling on a water stationary bike and muscular training on a step and a trampoline. Outcome measures were the quality of life for limb lymphedema questionnaire (LYMQOL), the 6 min walk test, the bioelectric impedance spectroscopy and limb circumference. The study was approved by the Ethics committee of the University of Quebec in Montreal.

Results

Since the research is still in progress, the anticipated results will demonstrate that limb volume was stable or significantly diminished in the affected limb; the distance covered in the 6 min walk test improved and so did the overall quality of life as determined by function, appearance, symptoms, and mood.

Conclusions

Aquatic training could facilitate access to moderate intensity activities for patients with lower limb lymphedema and optimize quality of life outcomes through exercise.

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