

The lymphatic system and skin conditions, old age and the impact of medications

Here, the editor answers some readers' questions and invites you to share thoughts and experiences

Lymphatic drainage to improve eczema and psoriasis

I am a Dr Vodder lymphoedema manual lymphatic drainage (MLD) therapist and have been working in the industry for 10 years. As part of my work, I have treated lymphoedema clients who also have eczema or psoriasis, which can exacerbate the swelling.

Having noticed good outcomes for these skin conditions, I have started to treat people with genetic eczema or psoriasis who do not have lymphoedema. Many of my clients have commented that they are able to sleep without constant itching, to reduce their medication, and that treatment has had overall positive physical and psychological benefits. This I interpret as indicating that people with inflammatory dermal conditions appear to be benefiting from MLD. However it would seem more research is needed to explore the stages of inflammation and the impact of MLD, alone and with medications that are normally used, to see what combination is best for optimal outcomes for these skin conditions.

I believe this is an exciting area with the potential to identify natural treatments that could assist in the management of eczema and psoriasis problems. It may be that a poorly functioning lymphatic system (perhaps with a genetic component to it) and corresponding increase in local inflammatory mediators (and concomitant local area swelling) could be an underlying cause of genetic and other forms of eczema and psoriasis. Logically, as MLD helps move the fluid from the inflamed area, this could be the most reasonable explanation for the reduction in inflammation.

Have any others observed similar positive effects on a patient with or without lymphoedema and these genetic skin conditions, and do you think this is a reasonable explanation?

Teresa McEleney, Lymphoedema MLD Therapist, Remedial Massage Therapist, The Movement Clinic, Melbourne, Australia

This observation is a very interesting and exciting one for all of us, especially as we find more evidence for the impact our genes have on lymphatic formation, growth and development. It is also interesting in view of recent findings (Chen et al, 2017) in which TNF α (a proinflammatory cytokine) has been shown to inhibit lymphatic pumping. When lymphatic function is improved, therefore, the tissue levels of this and other inflammatory mediators may be reduced. This may have an impact as eczema lesions are linked to the local tissue expression of proinflammatory cytokines/chemokines, which result in the activation of keratinocytes, T lymphocytes, macrophages, mast cells, etc, which result in the skin's inflammatory response. Of course, from the therapeutic point of view, emollients, local corticosteroids and topical immunomodulatory drugs can improve eczema, but would it not be great if MLD could do the same!

The Editor

Chen Y, Rehal S, Roizes S et al (2017) The pro-inflammatory cytokine TNF- α inhibits lymphatic pumping via activation of the NF- κ B-iNOS signalling pathway *Microcirculation* 24(3): doi 10.1111/micc.12364

Why don't more older people develop lymphoedema?

Although the lymphatic system serves highly critical roles, such as immune defence, lipid absorption and interstitium maintenance, it is still one of the most poorly understood and researched physiological systems in the body (Nowicki, 2013). In comparison to the vascular system, we have a limited understanding of how the lymphatic system changes during the ageing process. The consensus in the literature is that the capacity and function of the lymphatic system declines with age.

Studies have demonstrated that lymphatic contractile pressure and pumping frequency significantly decrease with increasing age (Nagai et al, 2011; Unno et al, 2011). The mechanism responsible for this is incomplete,

but may be related to the loss of extracellular matrix in lymphatic valves, loss of contractile proteins in the lymphatic vessel wall, reduced synthesis of nitric oxide – which is involved in contraction coordination of the lymphatic vessels – and disruption of lymphatic pump function through increased oxidative stress and reduced antioxidant activity with ageing (Gasheva et al, 2007; Nagai et al, 2011; Unno et al, 2011; Thangaswamy et al, 2012; Zolla et al, 2015). The 2015 study by Karaman et al also demonstrated a reduction in both lymphatic clearance, and lymphatic complexity and density in ageing mice.

When the lymphatic system is working well and is intact, excessive fluid does not usually accumulate in the tissue with adequate variations in external pressure to push fluid (Piller, 2013). Considering the elderly patient is typically less mobile, with limited respiratory and skeletal muscle movement, even with a patent system fluid should theoretically accumulate. Considering this and that the evidence suggests lymphatic function declines with age, the prevalence of lymphoedema in the elderly should be significantly higher than in young patients. This is separate to the fact that, as we age, the probability of having a cancer-related operation, which decreases territorial lymphatic capacitance also increases, e.g. mastectomy with axillary clearance or groin clearances. Unfortunately, the epidemiology of lymphoedema in the elderly, especially non-cancer-related lymphoedema, is limited. Morbidity and mortality from cardiovascular ageing is obvious in the healthcare system and the pathogenesis driving this is well evidenced. Why, however, does the ageing lymphatic system not mirror its neighbour with significant increases in non-cancer-related lymphoedema morbidity in the elderly? Someone may have an answer to this that we may be able to apply at other times to younger patients.

Dr Jake Nowicki, Medical Officer, Flinders Medical Centre, Division of Surgery, South Australia

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- Zolla V, Nizamutdinova IT, Scharf B et al (2015) Aging-related anatomical and biochemical changes in lymphatic collectors impair lymph transport, fluid homeostasis, and pathogen clearance. *Aging Cell* 14(4): 582–94

Could it be that their lymphatic load is reduced and is reducing more rapidly than lymphatic transport is declining, or is there something we have missed perhaps in terms of an increasing function of the deeper lymphatic system, the effect of positional equilibrium on general fluid clearance or a sign of good fluid and cardiovascular management in these patients? We may have something to learn here in terms of what it might mean for younger immobile patients — is it this or another factor like dietary management and or weight control? If other readers have had similar, or differing, experiences, please write in and let us know.

The Editor

Medication-induced disruptions to the lymphatic system: a significant long-term problem?

We hear a lot about radiation, surgical trauma and lymph node dissection contributing the development of lymphoedema, but to what extent could a history of lymphoma treated with high-dose chemotherapy contribute to signs of oedema anywhere in the body? And what about venous dysfunction damage (stripping/ligation, etc) to the lower legs?

I ask this because in 2002, at the age of 28, I was diagnosed with stage 3a Hodgkin's lymphoma. I had 12 cycles of ABVD chemotherapy (Adriamycin (doxorubicin) bleomycin, vinblastine and dacarbazine). I needed granulocyte-colony stimulating factor to stimulate my white blood cell counts and to maintain the treatment schedule. Other complications included digestive problems,

specifically acute constipation and reflux, and *Pneumocystis jiroveci pneumonia* infection about the 9th cycle. The delays associated with these complications possibly contributed to an immediate relapse, treated with two cycles of ICE chemotherapy (ifosfamide, carboplatin and etoposide) and then stem cell harvest and subsequent autologous stem cell transplant in July 2003.

I gained a lot of weight during treatment, which took nearly 18 months to lose again despite regular exercise and dietary changes. No doubt this is due in part to changes to metabolism, the steroids, etc. Over the past 10 years, I have noticed that I am occasionally 'puffy' in one or both ankles, my fingers and neck. There does not seem to be a specific pattern to it, although a long flight to Europe in 2015 resulted in swelling in the lower legs which took nearly 2 weeks to ease, even with daily MLD practice! I had worn flight socks while travelling but took them off as soon as I reached my destination because wearing them made my feet so hot that they hurt. I have also noticed that veins in the anterior lower legs are becoming more prominent and seemingly congested at times (more so in the heat, following a hot shower and being on my feet for work, which are all to be expected), are painful at times and feel soft and 'floppy'.

In December 2015, I had an intussusception caused by a hamartomatous polyp and approximately 30 cm of bowel was removed. This surgery was followed by postoperative ileus and pulmonary oedema, possibly due to over-prescribed potassium. Within 2 days of discharge, the wound was infected and I had further surgery and wound closure using VAC dressing. The scar is quite keloid and uncomfortable.

I still experience a lot of bowel discomfort, including flatulence, which no doubts add to the abdominal pressures, thus possibly reducing lymph flow through the area and from the mesenteric lymph collectors. My medications include fluoxetine and oestrogen for chemo-induced menopausal symptoms. I am also taking colestipol hydrochloride to assist with bile salt absorption.

I keep on getting conflicting views on the big picture of what might be happening and am interested to hear balanced views about the long-term systemic effects of chemotherapy and other medications on the lymphatic system, both for myself and also for my clients.

Amanda Bell, Lymphoedema Therapist, Napier City Massage Therapy, Napier, New Zealand

An interesting case history, which has wider importance with regards to asking key questions about the long-term systemic impact of chemotherapy and of medications on the lymphatic system structure and function and how it changes over time. We are aware of the impact of medications on the lymphatic system. Oedema can be a side-effect of many medications, including those used for the treatment of high blood pressure, nonsteroidal anti-inflammatory drugs, steroids, oestrogens and some diabetes medications. There are three general reasons for the appearance of medication-induced oedema:

- Sodium overload/retention
- Exacerbation of preexisting renal dysfunction
- Increasing vascular permeability

Of course, some medications cause more problems than oedema. Some may overload the lymphatics or slow down/compromise their ability to function well.

In this case study we have other issues: the weight gain (which we know can compromise lymphatic drainage) and constipation. Perhaps the underlying and key factor, however, may be the high-dose chemotherapy and its impact on the venous and lymphatic systems — after all these are the first in line to receive it in a high concentration and so the chance of damage or dysfunction may be high.

How do we know, though? How can we best tease out the range of influencing factors and deal with them better? Importantly, what is the impact of chemotherapy and how can we minimise the damage to the lymphatics — is it more activity/exercise generally or improved lymphatic drainage at the time of its administration to reduce its concentration and duration in the lymphatics or what? Research and case studies in this area are clearly needed.

The Editor

Send us your comments

Our readers have highlighted some important topics and we welcome your input. What are your views and experiences? Let us know, as your contribution could make a difference to many people. Email the editor, Adam Bushby, at: abushby@omniamed.com All letters will then be passed on to the clinical editor, Neil Piller