

The Research of Prof. Dr. P Hutzschenreuter

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This is a short summary of the main areas of research conducted by Prof. Dr. Paul Hutzschenreuter of the University of Ulm, Germany into the effects of Dr. Vodder's Manual Lymph Drainage. A bibliography of his research is at the end of the article.

Manual Lymph Drainage and smooth muscle cells.

What does MLD do? It adds pressure forces which are potential energy, changing the receptor potential of the mechanoreceptors of the skin. This causes a decrease of the sympathetic activity which leads to a dilation of the lymph collectors. Consequently the pressure in the lymph collectors rises and this leads to an increase in contractions.

A further increase in contractions is achieved by passive stretching of the smooth muscle cell. If, after adding potential energy, the contraction mechanism initiates chemical energy, this will facilitate a build up of kinetic energy which is a force increasing lymph flow.

Potential energy and chemical energy are converted into kinetic energy. So easy!!

Investigating the effect of MLD on edematous, paralyzed arms.

At one time, it was doubted that the edema of a paralyzed arm is a lymphostatic edema. How do patients with a flaccid arm paralysis react to MLD treatments with reference to the status of their autonomic nervous system and their microcirculation?

Taking the mean between the difference of two parameters – surface of the vessel and speed of blood flow before and after a series of treatments, no changes were found.

MLD has no effect on the autonomic nervous system of a patient suffering from a paralysis of the arm while MLD always has an effect on patients suffering from peripheral circulatory disturbances of the arteries.

Measuring skin resistance.

When applying MLD, the skin resistance measured in ohms significantly increases. This is triggered by a reduction of sympathetic nervous system activity and followed by an increase of the transport capacity of the lymph.

Stronger pressures activate the sympathetic nervous system, proven by a significant decrease of the skin resistance (ohm) followed by a narrowing of the vessels.

A stronger pressure will move the protein-rich interstitial fluid passively into less damaged tissues where this fluid can be absorbed by functioning initial lymph vessels.

Microcirculation in arterio-occlusive disease and diabetes mellitus.

Both diseases have a macro-and micro angiopathy which leads to a macro circulatory insufficiency. Clinically we see the walking range of a patient decreasing due to muscle pain arising from a pathologic microcirculation.

In a clinical study, 16 patients were treated with MLD during 4 weeks. The patients had to do a standardized walking training. The walking distance increased, the muscle hypertonicity decreased and the blood flow increased.

With reference to microcirculation, the effect of MLD in both diseases can be explained because the increased tone of the smooth muscle cell of the arterioles. This means we have an increased filtration and with reference to the lymph vessel system, an increased lymph flow due to a higher lymphangiomotoricity. More lymph-obligatory load is resorbed into the initial lymph vessels from the interstitial spaces and the transit stretch between capillary and cell is reduced. We all know that this brings more oxygen and nutrients to the cells. It is better to treat arterio-sclerotic vessel changes early when they are still reversible.

Proof of quality has been demonstrated for more than 30 years, i.e. measuring the volume of edemas.

Proof of quality work (i.e. an excellent MLD and bandaging) is never done or asked for. You sitting here attending reviews belong to the exceptions.

Whiplash: neck brace not required.

Whiplash is divided in 5 grades. **Grade 0** - no problems at all, **grade I**: problems with pain, stiffness and sensitivity to touch in the neck area, no physical signs; **grade II**: problems in the neck area with muscle and skeletal signs; **grade III** problems in the neck area with neurological signs; **grade IV**: problems in the neck area with fracture or dislocation.

Outpatient treatment can be applied only with grade I and II cases.

The first study was done with 30 patients. They wore a neck brace and had 10 MLD treatments. 20 out of 30 complained of ongoing headache and restriction in the range of motion of the cervical spine as well as a feeling of pressure at the base of the skull.

A second standardized study without neck brace and 10 MLD treatments was done. 24 patients were treated with MLD within the first 24 hours after the accident. The existing local post-traumatic edema in the dorsal neck area disappeared significantly after the 2nd MLD treatment. 10 of 24 patients were completely symptom free after these 10 MLD treatments and it was not necessary to give further MLD treatments to the remaining 14 patients.

Why is it not necessary to wear the neck brace? Why were the patients symptom-free after 10 MLD treatments?

Grade I and II whiplash is a combination of distortion of the cervical vertebra with a contused trauma of the soft tissues of the dorsal neck area.

To answer the first question: if intracapsular fracture and ruptures of ligaments are excluded radiologically, immobilization of the small vertebral joints causes a contraction of their capsules and deposition of post-traumatic substances. Each movement of the neck stimulates the passive lymph transport. Immobilization of the neck musculature due to the neck brace decreases lymph transport. Immobilization of the neck with a brace leads to chronic pain in the head and neck area.

Each trauma of soft tissue leads to a damage of the muscle fibers. A chemical reaction starts which ends in prostaglandin E and which dilates the vessels. An exudative process occurs which can last several days. This process can develop already by the second day into a proliferative phase.

If we began right away on the day of the trauma, this explains why the local edema (with grade I and II) already decreases after the second MLD treatment and it will not become a chronic condition.

Research studies looking at how patients and/or therapists react to MLD treatments.

The functional state of the Autonomic Nervous System (ANS) can be measured looking at the resistance of the skin with biotometry. With this method we proved a sympatholytic reaction of the patient when being treated with MLD.

Are the values of the skin resistance different in the therapist or the patient before the treatments started?

How does the ANS of the therapist react to MLD?

Does the ANS of the therapist and the patient react the same way to MLD or not?

4 MLD therapists treated 20 patients with secondary arm lymph edema (state II-III) on 5 consecutive days for 45 minutes each session. The result was:

- in 50% of all treatments the therapist and patient had a sympathicolytic reaction.
- in 21% of all treatments the therapist and patient had a sympathetic reaction.
- in 18% of all treatments the therapist had a sympathetic reaction and the patient, a sympathicolytic reaction.

The summary is that a sympathicolytic reaction was seen in the therapist in 61% of all treatments and in the patient in 68% of all treatments.

As long as the therapists treated lymphedema patients with similar tissue consistency (which means the therapist could always apply the same pressure) one could see a 50% agreement with the sympathicolytic effect on the therapist and the patient.

If intensive firmer pressure was applied, as in fibrosis movements then either the therapist and patient or the therapist or the patient had a sympathetic reaction (21%).

What effect does a sympathetic reaction have on the therapist and a patient with secondary lymphedema? Therapist's and patient's lymph vessels become spastic and filtration rate of the microcirculation increases due to vasomotion, which in the past was interpreted as a higher permeability of the capillaries. Every increase in interstitial fluid must be removed by the lymph vessel system, which has to be activated.

This happens as we know by the sympathicolytic state and local passive stretching of the lymph angion from inside and outside.

The pressure which is applied using the Vodder technique depends to a great extent on the consistency of the edema. The harder the tissue, the firmer the pressure we apply and with a harder pressure we find less sympathicolytic effect even if we use rhythmic MLD techniques. Furthermore, if the therapist is able to block out external distractions such as talking with the patient, this allows him or her to be fully concentrated during the treatment. The therapist can then observe a calming or sympathicolytic effect of the MLD. If, however the therapist is uncomfortable, for example suffering from back pain, the sympathetic reaction can be understood.

Further studies should be made in order to find out causes which have to be sorted out in order to increase the sympathicolytic reaction of patients and therapists that would further increase the effectivity of the MLD treatment. Vodder assumed that his MLD is most effective as a physical therapy if a sympathicolytic (vago tonic) effect is triggered.

Effect of MLD on peristalsis in the intestines

17 patients with secondary arm edema were treated 45 minutes twice per day (morning and afternoon).

Peristaltic movements of the small intestines become audible (borborygmus) which means that peristalsis is increasing due to an activated vagus nerve by MLD.

The peristaltic intestinal motility is stimulated with MLD which is a primary effect.

A secondary effect is that the vago tonic reaction is maintained until the second treatment.

A third effect is that the second treatment increases the vagotonic reaction and it is added to the primary effect.

Vodder assumed that his MLD is most effective as a physical therapy if a sympathicolytic or vagotonic effect is triggered.

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