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Literature

This article should be cited as follows:
THEYS, S ET AL. MANUAL DRAINAGE WITH OR WITHOUT DEEP OSCILLATION® IN LOWER EXTREMITY OEDEMA. Yvoir, Belgium, 2007.

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INTRODUCTION

Post thrombotic syndrome and lymphatic disease lead to interstitial fluid accumulation which is an ideal bacterial environment for repetitive inflammations. In most cases, their inevitable progression leads to a chronic and irreversible state. In such cases, no definite resolution can be expected anymore. Therefore, the major decongestive treatment aims are confined to reduce and to slow their progression. In this field, various decongestive treatments exist. It is a common practice to do a three-therapy made of bandaging, sequential pressotherapy and manual drainage (MD). Second in the list after bandaging, MD is the most prescribed treatment. However, alone, MD has been shown to be ineffective in prevention of lymphoedema (LO) [1] and in its reduction [2]. In phleboedema (PO), its efficacy is limited to the preservation of functional lymph drainage. To improve its effect, an intermittent electrostatic field with DEEP OSCILLATION®, achieved through light external manual or instrumental effleurages, is recently proposed. Medium-high frequency (80-200 Hz) would be able to soften the indurate tissue and to stimulate the lymph transport whereas low frequency (25-80 Hz) would be able to boost interstitial resorption [3].
To our knowledge, there is only one scientific work on this DEEP OSCILLATION® method for treating LO. In 20 cases of upper and lower limb LO wearing class II garments, Gasparo et al [3] found that HIVAMAT® 200 (Physiomed™) contributes to reduce the circumference of the limbs and the subcutis thickness. Comparison of the manual or instrumental HIVAMAT® 200 procedure is lacked. Any comparison with different frequency lacks too. Finally, the authors do not compare the effect of this technique with other decongestive modalities.
The present clinical trial tested the degree of leg volume reduction effectiveness of MD applied alone or added to recently introduced DEEP OSCILLATION® of the HIVAMAT® 200 on leg oedema volume in comparison to the responds obtain with DEEP OSCILLATION® alone (fig.1a).

METHOD

Ten consecutive patients were included prospectively in a three months period from September 1st to November 30th 2007. Each patient was recruited through the local angiologic unit of physiotherapy for a lower limb oedema decongestive treatment. They all gave informed consent. Of the ten patients, seven were females and three males. Ages

ranged from 55 to 83 years (mean 40 years). All of the oedemas were unilateral; six were phleboedemas (PO) and 4 lymphoedemas (LO). The duration of the disease varied from 2.1 to 19.8 years (med 10 years). At the upper third of the leg circumferences ranged between 36.5 and 50.3 cm with a 40.1 cm average.
The patients lies in decubitus on a firm bed with the legs slightly elevated, ankles positioned at the phlebostatic plane. The knee discomfort was eliminated by putting a pillow under the thigh.
In the beginning, MD focuses at the groin or at the front of oedema. It consists in a freeing of blockade area. After that a progressive retrograde procedure extends gradually to the distal part of oedema.
Deep vibration of tissues involved is induced - at a 100 Hz frequency – whether by mean of manual effleurage with rubber-gloved hand whether by mean of instrumental effleurage covered by rubber isolation. The same retrograde procedure of the MD was used.
MD and HIVAMAT® 200 were used twice: once separately, once simultaneously. The 16 min session of these three procedures were spaced in time by 15 min rest. The order of execution offered 6 possibilities and was at random permuted after each case.
Over the past decades phlethysmography has proven to be a useful, non-invasive and readily repeatable method for evaluation of limb segment volume changes. So this technique is still considered as the method of choice to document and evaluate a decongestive treatment. Using a Hg plethysmograph (SeriMed PL2) gauge fitted at 10 cm below the knee, relative leg volumetric variation (%ΔV) was assessed continuously during all the studies (108 min). In a following time, data were expressed as a relative speed of volumetric reduction (%ΔV/min). Finally, they were presented by box plots (fig.2) as mean, median (interquartile range) values and 75, 25 quartiles.

RESULTS

No patient developed a side effect or was excluded for any reason. All the leg oedema volume, taken continuously before, during and after the three procedures, showed a significant decrease. Volumetric calf decrease reaches 0.0902 %∂V/min manually, 0.0711 %∂V/min by mean of HIVAMAT® 200 and 0.1568 %∂V/min by mean of simultaneously methods (fig.3). There was no significant difference among MD and HIVAMAT® 200. These data show that the combined method promotes greater decongestion than the MD alone, MD decongestion whose is superior to the HIVAMAT® one's alone.
A mean reduction of 0.114 %∂V/min was found in patients in whom PO was present compared with 0.094 %∂V/min in those with LO; a difference which did not reach statistical significance because of the small sample.

DISCUSSION

Overall the group experienced a leg volume reduction as much by MD as by HIVAMAT® 200, applied separately. The fact that this last method helps decreasing leg oedema may provide a clue to the auto-use of HIVAMAT® 200 as previously suggested by Gasbarro et al [3]. For us, such suggestion is too hasty. In one hand, consensus presently exists that MD helps to reduce

oedema only while it is used in concert with other procedures [4]. In the other hand, the comparison makes no difference between the two methods used separately. With such similarity, there is no compelling evidence to conclude that the option of a HIVAMAT® 200 self-treatment may be of additional interest. Furthermore, is the positive effect observed compatible with a reasonable management cost?
A greater decrease of leg volume was recorded when MD and HIVAMAT® 200 were applied simultaneously. Is the result satisfactory enough to the adjunct of HIVAMAT® 200 in a "complex decongestive physiotherapy? In this pilot study, we only used one frequency (100 Hz). Gasparo et al [3] did not compare effect of medium-high to low frequency too. So the optimal treatment strategy for chronic lymph oedema remains unclear. Future studies are needed to examine the effect of others protocols.
At last, the finding may not be representative of relationship trend between a cause and effect.
Our preliminary study failed to detect major differences between PO and LO, because of the small number of subjects studied. Further studies in larger samples are needed to clarify the differences between methods and protocols and to gain a more comparative understanding of oedema drainage.

CONCLUSION

Thanks to MD or DEEP OSCILLATION® application, a similar reduction of the leg oedema was achieved. This small study suggests that the addition of MD to HYVAMAT® 200 could improve treatment outcome in patients with lower limbs oedema. No adverse reactions were recorded. Subjects did not feel any discomfort.

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Figures

Figure 1: Manual drainage, instrumental and manual HIVAMAT® 200 procedures.

Figure 2: Volumetric calf decrease (%∂V/min) obtained by mean of DM, instrumental HIVAMAT® 200 procedure and simultaneously methods.

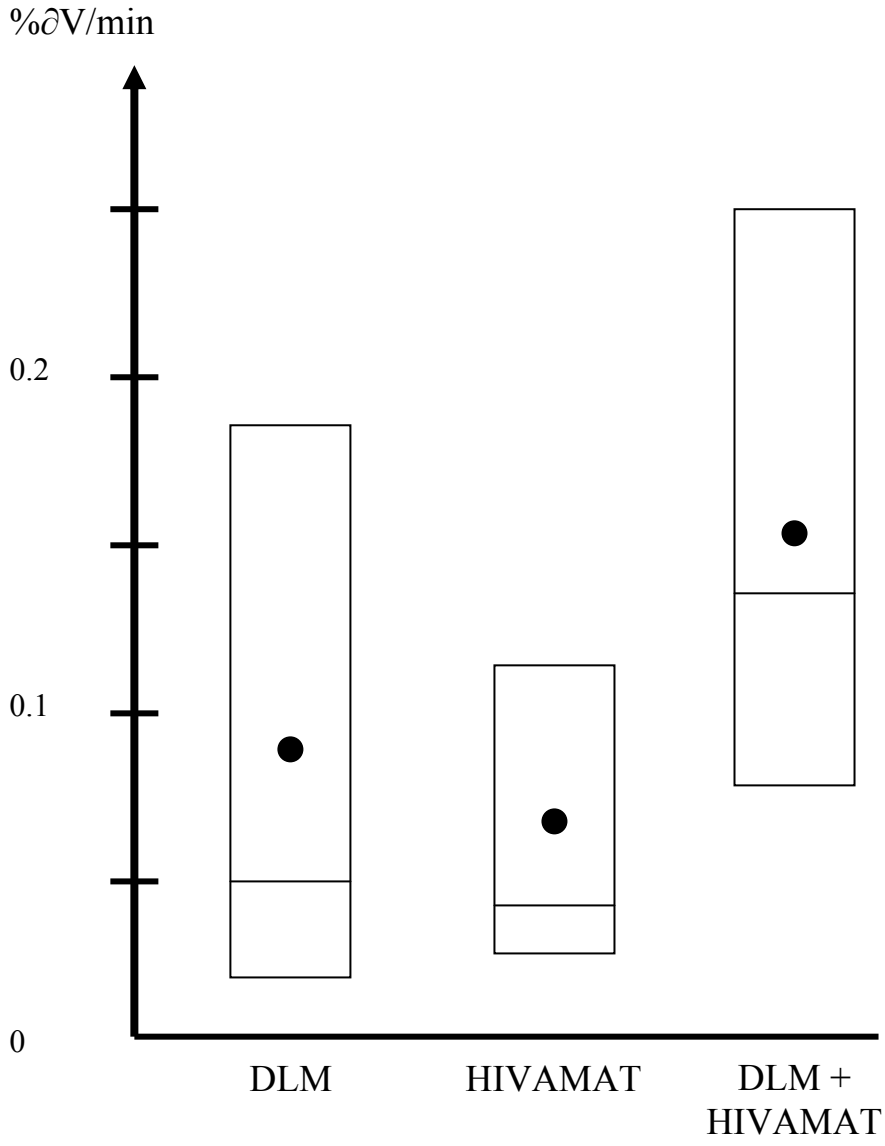

*Figure 2: Box plots of v*olumetric calf decrease (%∂V/min) obtained by mean of DM, instrumental Hivamat® 200 procedure and simultaneously methods.