Curative mud and paraffin treatment for hand and wrist pain syndromes in female workers.

V-R. Tuulik[1,2], S. Saarik[1], V. Tuulik[1], M. Übner[1,3], T. Vare[1], E. Makienko[1]
[1]The Centre of Excellence in Health Promotion and Rehabilitation, [2]West Tallinn Central Hospital, Tallinn, Estonia,
[3]Pärnu College, University of Tartu, Pärnu, Estonia

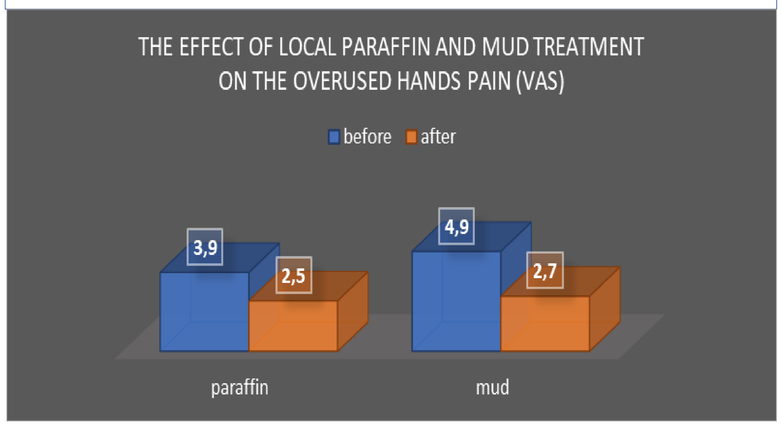
Investing in your future
European Union
European Regional Development Fund

Aim of the study

To measure the effectiveness of curative mud and paraffin treatment in case of hand and wrist pain syndromes in female workers.

Introduction and objectives

Musculoskeletal disorders (MSD) are the main causes of work disability in the EU. MSD-s represent enormous costs to the community in economic terms (1). Painful disorders of the back, neck and upper limbs are the most frequent diagnoses, with sickness absence, long-term incapacity for work and permanent disability as frequent consequences. Better targeted – and earlier – interventions by governments, health care systems, welfare regimes, employers and workers themselves might play a decisive part in reducing the damaging impact that MSDs can have on the lives of workers and their families, on employers and on wider society (2). Insufficient blood supply to muscles, as well as unfavorable metabolic processes play a primary role in the development of overload disease. (3)
Repeated local thermostress treatment could repair the microcirculation in overused regions. Hot stimuli may also influence muscle tone and pain intensity, helping to reduce muscle spasms and to increase the pain threshold in nerve endings.



Methods and Materials

We used local hot packages with Haapsalu Bay curative mud and hot paraffin for the treatment of overused hand pain syndromes.
The study was carried out during the years 2012-2015. The medical ethics committee of the National Institute for Health Development of Estonia approved the study and written informed consent was obtained from all the participants. Two factories where previous workplace risk analyses had shown the workers' upper extremities overuse were chosen for the study by the occupational medicine unit. Standardized Nordic questionnaires on the musculoskeletal (MS) symptoms were used by the occupational medicine doctor to measure the individual level of MS pain of the upper extremities on the Visual Analogue Scale (VAS) 0 to 10.

39 workers with upper limb overuse pain were exposed to 10 local thermotherapies on the hands.

1) 42 °C mud group 20 persons with the mean age of 52.2±9.9, BMI 27.6±5.1, working years 11.2±9.0 and
2) warm paraffin treatment group: 19 persons with the mean age of 52.9±8.2, BMI 26.3±5.2, working years 11.6±9.9.

The mean pain score on the Visual Analogue Scale in the curative mud group was 4.9 before and 2.7 after the treatment and in the paraffin group 3.9 before and 2.5 after the local treatment on the hands.
The long term effect is difference between the pain scores before the first and before the tenth treatment (more than 24 h after the ninth treatment) to detect the effect of the repeated heating of mud or paraffin.

Results

In the group of local warm curative mud application, the pain score decreased 44.9% ($p<0.0001$), and in the group of paraffin treatment 36.1% ($p<0.012$).

Discussion

The general response of the organism to environmental factors, called stressors, is to sustain the internal homeostasis. If heat is applied to sufficient surface of the extremities, the core temperature starts to rise. The objective is for blood to carry the heat off from the exposed areas, dissipating it to relatively colder areas. A warm application increases the surface temperature of the specific area of the body where it is applied and stimulates its warmth receptors, causing vasodilatation. Due to the effects of vasodilatation, the blood flow improves, blood viscosity is reduced, the delivery of leukocytes and lymphatic circulation rises due to incresed permeability of capillaries, which helps in removal of waste products.
A mean temperature of 41.7±0.9 °C in heated tissue capillary fronts is a threshold temperature for heat-induced angiogenesis. The densities in heated tissue capillary fronts could triple from 2 to 7 weeks. (4)
Better results in mud group are probably due to the chemical effect of curative mud. Curative mud contains a lot of minerals and bioactive organic compounds which stimulate the positive effect on the microcirculation in the overused regions, especially in case of MSD medium pain syndromes (5) and also the additive anti-inflammatory effect of serial mud therapies (6).

Conclusions

Repeated local thermostress treatment could repair the microcirculation in overused regions and lead to pain relief. **Local warm applications of mud or paraffin could be a method for the prevention and treatment of hand and wrist overuse pain syndromes.**

Contact

Tallinn University Haapsalu College
The Centre of Excellence in Health Promotion and Rehabilitation
Address: Lihula mnt 12, 90507, Haapsalu, Lääne County, Estonia
Phone: (+372) 47 20 353
E-mail: info@terekk.ee

References

1. Brooks, P.M. (2006). The burden of musculoskeletal diseases – a global perspective. Clinical Rheumatology 25(6), 778–781.
2. Bevan, S., Quadrello, T., McGee, R., Mahdon, M., Vavrovsky, A., Barham, L. (2009). Fit for work? Musculoskeletal disorders in the European workforce. London: The Work Foundation.
3. Kitahara, T., Schnoz, M., Läubli, T., Wellig, P., Kruegeret, H. (2000). Motor-unit activity in the trapezius muscle during rest, while inputting data, and during fast finger tapping. European Journal of Applied Physiology 83(2–3), 181–189.
4. Seese, T.M., Harasaki, H., Saidel, G.M., Davies, C.R. (1998). Characterization of tissue morphology, angiogenesis, and temperature in the adaptive response of muscle tissue to chronic heating. Laboratory Investigation 78(12), 1553–1562.
5. Tuulik, V.R., Pille, V., Tamm, M., Tuulik, V., Tint, P., Tilk, M., Saarik, S., Vare, T. (2015). The effect of outpatient mud and spa-therapies on the tissue perfusion measured with laser Doppler in work related upper extremities overuse syndromes. Boletín de la Sociedad Española de Hydrologia Medica 30(2), 193–204.
6. Lange,U., Goronzy J.-E., Mueller-Ladner, U., Frommer, K., Dischereit, G. (2018). Anti-Inflammatory effect of serial mud baths in rheumatoid arthritis and ankylosing spondylitis IOSR Journal of Pharmacy and Biological Sciences 13(2), 59–63.