On the basis of the results obtained in the in vitro experiments we concluded:

1. The exposure of isolated white blood cells to the electrical field produced by DEEP OSCILLATION® did not change the biochemical pathways, which lead to oxygen radical production. Therefore the weak electrical signals with particular characteristics did not influence WBC cellular membranes directly.

2. The exposure of whole blood activated by the protein kinase C activator PMA to the DEEP OSCILLATION® produced electrical field for 3, 15, and 30 min led to significant increase (40-45%) of oxygen radical production. By unknown yet mechanisms, DEEP OSCILLATION® involves the blood plasma components in the WBC membrane enzyme activation, which is a key enzyme in oxygen radical generation by the blood leukocytes. Since PMA simulates one of the most important endogenous defense mechanisms against bacterial, viral, and cancer cells (endogenous immunity process) we concluded that DEEP OSCILLATION® acts as an immuno-stimulator enhancing the body capacity to fight exogenous infections and, probably, to diminish the risk of tumor development.

3. Exposure to DEEP OSCILLATION® slightly inhibited oxygen radical production by the whole blood leukocytes activated by Ca-ionophore A 23187. The activation with A23187 results in the release of inflammatory mediators such as the products of arachidonic acid oxidation. Therefore DEEP OSCILLATION® could be considered as having an anti-inflammatory action.

4. The incubation of platelets under exposure to a weak electrical field for 3-30 min did not affect either platelet degranulation (Fig. 7) Nor aggregation (data not shown). Therefore, DEEP OSCILLATION® did not have any effect on the major platelet functions in the in vitro experiments. On this basis we could suggest that DEEP OSCILLATION® exposure would not increase the risk of thrombosis in the individuals.
BURNS


Study Title: Valor de la Terapia con oscilaciones profundas en la cicatrización de las quemaduras AB.

Translation: The Value of DEEP OSCILLATION® therapy in the healing of burns AB.

Publication: Revista Cubana de Medicina Física y Rehabilitación RNPS 2244-FOLIO 148- ISSN 2078-7162 Rev Cub MFR v.2 n.1 Ciudad de la Habana ene-jun.

Results & Conclusions:
The results with the use of deep oscillation therapy are attributable to the positive effect of reducing pain, anti-inflammatory effect, antifibrotic effect, tissue regeneration effect 19, 20, with the mild effect of the massage on the lesion, vasodilation is achieved, which promotes blood flow and an adequate nutritional supply of tissue oxygen. Patients in the study group treated with Deep Oscillation therapy showed a significant decrease in the healing time of 5.4 days compared with those treated with silver sulfadiazine alone. In all the variables analysed the differences were statistically significant, before and after completing treatment.

Deep oscillation therapy combined with 1% silver sulfadiazine is effective in the treatment of burns, with a shorter healing time when compared with treatment with silver sulfadiazine.

CELLULITE TREATMENT


Study Title: Treatment of Gynoid Lipodystrophy (Cellulite) with DEEP OSCILLATION®: A Pilot Clinical Study.


Results & Conclusions:
The pilot study confirmed the absolute safety of the method (there were no any immediate or remote adverse effects or complaints from the participants), its high efficacy in 93% (n=28) of the women (the circumferences diminished from 59.0 to 57.1 cm, upper thigh, p<0.0002; from 51.4 to 49.8 cm, lower thigh, p<0.0001; from 40.7 to 38.5 cm, upper leg, p<0.003). The elasticity characteristics were improved in 48% (n=14) of the patients; the edema, lymph stasis, and fibrous heterogeneity of subcutaneous layer were improved remarkably in 80% (n=24) of the Patients. The general conclusions of the experts were that the DEEP OSCILLATION® method was efficient in more than 80% of the cases with moderate (grade I”II) cellulite.
**CLINICAL EXPERIENCE – FEEDBACK IN 2002/3**

**Authors:** PORTNOV, V & Y. ZABELINA. President Affairs Department of the Russian Federation Medical Center Central Clinical Hospital (PADRF MC CCH), Moscow, Russia

**Study Title:** Expectations and reality: First results of HIVAMAT® 200 system clinical use in Russia in 2003

**Results & Conclusions:**

Our preliminary data enable us to state, that the described method has, undoubtedly, high potential of application in view of its ability to fight pain and edema, as well as its resorptive effect. Small dimensions and weight of the apparatus (2.5 kg), presence of built-in storage cell making it possible to carry out the treatment sessions without the need in external power source, and simple operation make this apparatus appropriate for use during acute stage of diseases within emergency aid and during early post-operative period directly in wards.

**Authors:** PORTNOV, V & Y. ZABELINA.
President Affairs Department of the Russian Federation Medical Center, Central Clinical Hospital (PADRF MC CCH), Moscow, Russia

**Study Title:** New method for deep "massage" of tissues: first results of HIVAMAT® 200 system clinical application in Russia. 2002

**Results & Conclusions:**

No subjective signs of HIVAMAT® 200 System negative effects on therapist have been noted. To obtain the objective data on the effects of electric field on physician, we have evaluated the microcirculatory reactions using a method of laser tissue Doppler flowmetry with a Periflux"2 apparatus (Sweden), measured the partial pressure of oxygen and carbon dioxide in hand tissues with a TSMZ apparatus (Radiometer, Denmark), evaluated ECG parameters and checked blood pressure before and after the treatment sessions. No statistically significant changes have been revealed. Thus, we have confirmed and added to data obtained by German authors on analgetic, anti-spasmodic and anti-edematous effects of the new method of physiotherapy during acute stage of various diseases. This data, in conjunction with the proved safety for therapist, form the necessary basis for wide introduction into practice of this new medical technology.
**FIBROMYALGIA SYNDROME**

Authors: Janik, H. et al (2010)

Study Title: Treatment of patients with Fibromyalgia Syndrome with vibration massage by DEEP OSCILLATION®


**Results & Conclusions:**

Sixty-three patients finished the study per protocol. At I2 and I3, the FIQ-D and all measures of pain and quality of life were improved clinically relevant (p<0.001). At I2, patients reported that the adverse events related to treatment (n=56, mainly pain and fatigue) were mild and short lasting; they did not result in dropouts. Twenty-nine patients did not report any adverse events. Patients rated the tolerability of the treatment as “good” with a mean of 1.8 (95 % CI 1.53;2.07) (5 point Likert scale). The results of the study suggest that a treatment series with deep oscillation massage has a long-lasting effect on symptoms of Fibromyalgia, pain and quality of life. As it was well tolerated, it may be a useful and safe tool for the symptomatic treatment of FMS.

**LUNG INFLAMMATION**

2005

Author Korkina, L. (2005):

Study Title Biological effects of low intensity electromagnetic fields and electrostatic massage in the model of quartz-induced acute lung inflammation. Unpublished.

**Results & Conclusions:**

The present study showed that the physiotherapeutical device HIVAMAT® 200 substantially suppressed both local inflammation in the lungs and redox imbalance induced by quartz in the lungs of experimental rats evidenced by the decrease of neutrophil content, protein level, and GPx activity in the BAL fluid as well as by the increase of GSH concentration in the lung tissue. At the same time, HIVAMAT® 200 did not affect generalized oxidative stress in the blood. HIVAMAT could be recommended for the treatment of acute lung inflammations of different origin in combination with conventional therapies.
LYMPHOEDEMA TREATMENT

Authors: Jar, S., Shoppe, B., Reischauer, A. (2008):

Study Title: Effect of treatment with low-intensity and extremely low frequency electrostatic fields (DEEP OSCILLATION®) on breast tissue and pain in patients with secondary breast Lymph edema.

Publication: J Rehab Med 40, 645-650.

Presented at The British Lymph logy Society Annual Conference, Belfast 2008

Results & Conclusions:

The results of the pilot study presented here show that DEEP SCILLATION® performed in addition to manual lymphatic drainage in patients with secondary lymph edema of the breast substantially improves outcome in terms of alleviation of pain, mobility, and lymphoedema volume reduction compared with manual lymphatic drainage alone. We therefore conclude that more attention should be paid to patients with breast lymphoedema and that treatment with low-intensity and extremely low-frequency electrostatic fields (Deep Oscillation®) could be a useful supplementary therapy in the management of patients with breast Lymphoedema.


Study Title: Evaluation of the effect of DEEP OSCILLATION® (HIVAMAT®) on tissue changes of the breast in patients with secondary breast Lymphedema.


Results & Conclusions:

HIVAMAT 200 therapy resulted in significant, clinically relevant, pain reduction. This effect was not observed in the control group. Swelling was subjectively assigned a score of 5.9 on the VAS by the patients at the initial examination. Patients in both groups reported significant reduction in swelling. The reduction of swelling was objectively confirmed by 3D measurement in both groups. The results of our pilot study suggest that additional HIVAMAT 200 therapy supplementary to manual lymphatic drainage can significantly improve outcome in terms of pain alleviation and volume reduction in patients with secondary breast lymphoedema compared to manual lymphatic drainage alone. HIVAMAT 200 therapy is a beneficial supplementary approach in treating breast lymphoedema.
LYMPHOEDEMA continued…2

Authors: Gasbarro V., Bartoletti R., Tsolaki E., Sileno S., Agnati M., Coen, M., Conti M., Bertaccini C. (2006):

Study Title Ruolo dell'oscillazione profonda (HIVAMAT® 200) nel trattamento fisico del linfedema degli arti.

Translation Role of HIVAMAT® 200 in the treatment for Lymphoedema of the limbs


Results & Conclusions:

HIVAMAT® 200 is a new instrumental physiotherapeutic method which employs intermittent electrostatic fields with DEEP OSCILLATION® in order to stimulate the transportation of interstitial liquids and their components and allow fibre and tissue layers to regain motility and flexibility. All these effects are achieved through minimal external pressure. On the basis on our experience, the optimum treatment for lymphoedema of the limbs can be achieved between two or three week cycles of Complex Decongestive Therapy (CDP). Thus through a combination of CDP and HIVAMAT® 200 methods which are able to stimulate transportation on interstitial fluids and their components we can ensure an improvement of the treatment quality, a reduction in treatment times with positive effects on the patient management costs and an improvement of the patients quality of life.


Article Title Adjuvante Therapie beim Lymphödem. Akt. Lymphol. 20, 25-29.

Combination of lymphatic drainage together with HIVAMAT® 200 significantly better results than without DEEP OSCILLATION®


The therapy method HIVAMAT® 200 in anti-oedema/de-blocking therapy
LYMPHOEDEMA– continued..3

Experiences with HIVAMAT® 200 in lymphatic drainage - investigative study

HIVAMAT® 200 as physiological adjuvant in lymphatic oedema and pain

POSTPARTUM RELATED PROBLEMS

Post pregnancy related problems: plugged milk ducts, pain, healing from Caesarian section, stretchmarks.

Results & Conclusions:

The author concludes that DEEP OSCILLATION® had significant and clinically relevant influence on swelling, indurations, spontaneous pain and tenderness. The therapy is safe and free of side effects. There is complete compliance after the first treatment and a high level of acceptance of the lying-in women.
**POST SURGICAL- HIP PROSTHESIS**


Study Title: Hochsignifikante Therapieerfolge mit DEEP OSCILLATION® in der orthopadischen

Publication: Rehabilitation. Orthopadische Praxis 44, 9, 448-453.

**Results & Conclusions:**

The addition of DEEP OSCILLATION® to standard rehabilitation programme in patients with hip prosthesis lead to high acceptance with the therapy, very good results in the domains pain, mobility and flexibility. It is an effective therapy option for the acute postoperative situation.

**CONSERVATIVE THERAPY FOR A CARCINOMA OF THE BREAST FOLLOWED BY EARLY TREATMENT WITH DEEP OSCILLATION® THERAPY**


Study Title: Nebenwirkungen nach brusterhaltender Therapie des Mammakarzinoms. Erste Ergebnisse mit HIVAMAT®.


**Results & Conclusions:**

The authors conclude that MLD assisted by DEEP OSCILLATION® has significant better results than MLD alone. As the therapy can be applied from the first day after surgery a prophylactic neofacilitation and neoformation of lymph pathways seems to be possible. This can have effects on the prevention of a secondary lymphoedema. A follow-up of the working group proved a lower rate of secondary lymphoedemas in the group treated with DEEP OSCILLATION®.
SPORTS INJURIES

Author
Aliyev, R. (2009):

Study Title
Klinische Wirksamkeit des Therapieverfahrens Tiefenoszillation bei Sportverletzungen.

Clinical effectiveness of DEEP OSCILLATION® in the treatment of sport injuries.

Publication
Sportverl Sportschad 2009; 23: 1–4

Results & Conclusions:

Subjective rating of the symptoms by VAS improved significant (p = 0.001) from 8.7 (baseline) to 2.1 points (post-treatment). Objective rating by the attending physician according to different clinically relevant parameters lead to “very good” or “good” results in 90% of the patients.

In conclusion it can be stated that therapy method deep oscillation is an easy to use and comparably cost effective adjuvant therapy Option. We already had good experience with it in other indications concerning reabsorption of oedema, reducing pain, anti-inflammatory effect, promotion of motoricity, promotion of wound healing, anti-fibrotic effect and improvement in trophicity and quality of the tissue. All these mentioned effects can be confirmed in the treatment of patients with acute sports injury and trauma. The soft mode of action is the reason that in contrast to other electric and mechanical therapies it is no contraindication in immediate therapy. In general we noted no side effects; patients were highly compliant and rated this therapy as very good.
WOUND HEALING

Author

Study Title
Using the HIVAMAT® 200 system in the treatment of wounds.

Publication:
Rehabilitacja w Praktyce 1, 28-33.

Results & Conclusions:
The use of the Hivamat 200 system, particularly based on the available research presented by the developers of this method, leads to considerable acceleration in the healing of damaged tissue, thus giving it great significance for physiotherapy. Above all, more rapid healing significantly improves the quality of cicatrization of tissue, allowing the quicker and more efficient introduction of other rehabilitation methods, especially kinesitherapy. This turn not only implies a more rapid return to normal tissue functioning, but also represents considerable improvement in quality. A special area for research on the usage of this system seems to be the field of sports traumatology, where quick but reasonable improvement is of considerable importance. Additionally, when conducting further research, more attention should be paid to the explanation of the mechanisms controlling the bacteriostatic activity of the system which are not fully recognized and in particular the restraining of excessive protease activity. In this latter case, an analysis should be made in particular of the polarity of protease particles.

Authors:

Study Title
Wound Healing Effects of DEEP OSCILLATION®.

Presented at
1st. International Conference on Skin and Environment, Moscow- St. Petersburg, 71.

Results & Conclusions:
DEEP OSCILLATION® has the following general effects concerning wound healing: improvement in wound healing (dynamic wound healing), anti-inflammatory effect, acts as an anti-oxidant, anti-inflammatory effect, decreases swelling, anti-edematous effect. DEEP OSCILLATION® positively affects wound healing in terms of systematic parameters and in the visible result.