Olav Skille

# VARIATIONS IN BLOOD PRESSURE AND PULSE DURING VIBROACOUSTIC TREATMENT. PILOT STUDY.

**SUMMARY**

**In TRILAX Centre, Steinkjer, routine measurements of Blood Pressure (BP) and Pulse (P) are done to evaluate the effect of treatment on the clients. A sample of 82 measurements show a marked, but varying effect on the measured functions. The medium values were : Syst. BP -4,34. Diast. BP -5,35. Pulse - 4,49.**
**Rising values were found in about 25 % of the cases.**
**The measured values are checked initially (A), after 5 min rest (B) and at termination of treatment (C). The variation of values A-B, B-C, and A-C are described.**
**The necessity for further studies in order to increase the predictability for a reduction of BP is emphasized.**

## TRILAX CENTRE, STEINKJER.

TRILAX Centre, Steinkjer, is a private centre to which clients are coming to receive VibroAcoustic therapy. The centre is not offering any other kind of treatment.

## THE BASIS FOR THE STUDY.

In TRILAX Centre, Steinkjer, one has included measurement of Blood Pressure and Pulse in the standard procedure of client reception. Systolic blood pressure(SPB) and Diastolic blood pressure (DBP) and Pulse (P) are measured.
The study includes 82 randomly chosen measurements of patients coming for treatment during fall 1988. The all-over distribution of patients show 30% men and 70% women.
20-29 years : 6%. 30-39 years : 17%. 40-49 years : 16%..
50-59 years : 18%. 60-69 years : 20%. 70-79 years : 14%
80-89 years : 3%
A Digital Electronic Blood Pressure Monitor from Select a/s was used as measuring instrument.

## THE THERAPY

VibroAcoustic Therapy gives the client whole-body excitation from sinusoidal, regularly pulsating, sound-pressure waves in the VibroAoustical area (30 Hz - 120 Hz). The frequencies are chosen according to the purpose of the treatment. The sound-pressure waves are mixed with music to soften the effect of pure machine-sound. The therapy has been developed by the author of this article.
The client is exposed to the therapeutic sound system sitting in a VibroAcoustic chair or lying in a VibroAcoustic bed in which sound-vibration impulse givers are built in covering the main exposure areas : Shoulder/Neck, Low Back, Thighs and Calves.

The equipment in use has been a MultiVib Chair VA 115 or a TRILAX Bed VB 555 and signal unit SU 225 from **VibroAcoustics a/s**. The therapy programs are made by **VibroSoft a/s** and are supplied on
ready-made C-60 cassette tapes. The music which is used to mask the low frequency signals is supplied by the composers Otto Romanowski, Finland and Svein Sjøholt, Norway. For research purposes other musical bases have also been used.
A therapy session normally lasts between 20 and 29 minutes.

RESULTS

Basic values :

SBP at arrival : m = 138,09 sd = 14,37
DBP at arrival : m = 86,72 sd = 7,69
P at arrival : m = 76,54 sd = 16,01

SBP after 5 minutes rest : m = 127,54 sd = 18,08
DBP after 5 minutes rest : m = 79,84 sd = 15,49
P after 5 minutes rest : m = 72,44 sd = 13,95

SBP after therapy session : m = 124,15 sd = 16,90
DBP after therapy session : m = 77,05 sd = 11,41
P after therapy session : m = 67,77 sd = 11,60

**B-C (After 5 min. rest and at end of therapy session)**

**Effect on Systolic Blood Pressure (ASBP)**
From N= 82 there was observed a SBP rise in 24 clients (29,3%) and a SBP fall in 57 clients (69,5%). Unchanged values in 1 client. In the whole group one found middle value (m) = -4,34 with standard deviation (sd) = 9,44.
Looking at the N=24 where a rising SPB was observed one observes m= +8,86 and sd= 10,58.
In the N= 57 where SBP was lowered, one finds m= -9,98 and sd= 7,65.

**Effect on Diastolic Blood Pressure (ADBP)**
A rise in DBP was observed in 22 clients (26,8%) and a DBP fall in 58 clients (70,7%). Unchanged values in 2 clients.
From N= 82 one found m= -5,35 and sd=7,69.
In the N= 22 where a DBP rise was observed one finds m= +8,86 and sd= 10,58.
In the N= 57 where DBP was lowered one finds m= -9,09 and sd = 7,66.

**Effect on pulse (AP)**
A rise in P was observed in 18 clients (22,0%), and a falling P in 56 clients (68,3%). Unchanged in 8 clients.
From N= 82 the effect was m= -4,49 and sd 7,20.

In the N=18 where a P rise was observed one finds m= +4,78 and
sd = 4,16.
In the N= 56 where P was lowered one finds m= -8,43 and sd = 5,08.

**A - B. (At arrival and after 5 min rest)**

In order to - in any case, partially - eliminate the effect of pure rest, the clients in step B - C were examined after 5 min rest. To demonstrate the effect of pure rest one has measured the effect of this rest by comparing SBP, DBP and P measured at arrival and after 5 min rest. The client was placed in the chair/bed and the initial measures were taken. After 5 min the measuring process was repeated, and the therapy procedure started.

**FINDINGS**

**Effect on systolic Blood Pressure (BSBP)**
In the whole group one found that SBP rose in 16 clients (19,5%),
fell in 62 clients (75,6%) and was unchanged in 4 clients.
In the whole group N=82 one found m= -4,29 and sd = 9,44.
In the N= 16 where rising SBP was observed m= +7,06 and sd = 3,51.
In the N= 62 where a falling SBP was observed m= -12,74 and sd = 8,94.

**Effect on Diastolic Blood Pressure (BDBP)**
In the whole group one found that DBP rose in 22 clients (26,8%), Fell in 55 clients (67,1%) and was unchanged in 5 clients.
In the whole group N= 82 one found m= -4,23 and sd = 10,67
In the N= 22 where rising DBP was observed m= +7,41 and sd = 7,73.
In the N= 55 where a falling DBP was observed m= -8,51 and sd = 9,92.

**Effect on Pulse** (BP)
P rose in 19 clients (23,2%), fell in 51 clients (62,2%) and was unchanged in 12 clients.
In the whole group N= 82 one found m= - 3,16 and sd = 7,18.
In the N= 19 where rising P was observed m= +5,32 and sd = 5,69
In the N= 51 where falling P was observed m= -7,14 and sd = 5,06

**A - C (At arrival and at end of therapy session)**

In order to - if possible - obtain data which can give a clearer explanation of the specific effect of VibroAcoustical therapy, one has included the extreme values - without compensating for the effect of 5 min rest, as done in table B - C.

**Effect on Systolic Blood Pressure (CSBP)**

SBP values rose in 12 clients (14,6%), fell in 67 clients (81,2%) and was unchanged in 3 clients.
In the whole group N= 82 m= -12,20 and sd = 12,94.
In the N= 12 where SBP rose, m= +8,33 and sd = 6.09.
In the N= 67 where SBP fell, m= -16,75 and sd = 9,35.

Effect on Diastolic Blood Pressure (CDBP)
DBP values rose in 14 clients (17,1%), sank in 63 clients (76,8%) and was unchanged in 5 clients.
In the whole group N= 82 m= -7,98 and sd = 11,23.
In the N= 14 where DBP rose, m= +6,00 and sd = 7,69.
In the N= 63 where DBP fell, m= -11,38 and sd = 10,03.

Effect on Pulse (CP)
P values rose in 13 patients (15,9%), fell in 67 clients (81,2%)
and were unchanged in 2 clients.
In the whole group N= 82 m=-7,40 and sd = 8,25
In the N= 13 where P rose, m= +5,46 and sd 5,84.
In the N= 67 where P fell, m= -9,87 med sd 5,54.

## DISCUSSION

The statistical data the article is based upon are few, but many enough to give an indication of what effects one can expect on SBP,DBP and P as a consequence of exposition to VibroAcoustical Therapy.
The results cannot be directly compared with other studies dealing with the effect of rest on SBP,DBP and P, as all persons were exposed to VibroAcoustic stimuli in the rest period.

It is difficult to predict the described effects in a patient.
Patients who react to the therapy with a rise in the measured parameters have the same subjective feeling of stress-reduction, muscular relaxation and well-being after end of therapy session as patients in whom the same values are falling. The rise in values therefore have no correlation with physical discomfort.

It is a ca. 75% probability for a fall in SBP,DBP and P values in a patient who is exposed to VibroAcoustic Therapy. A patient cannot be expected to show the same direction of effect during repeated treatments. The mean values of the above mentioned parameters are respectively -4,34 and -5,35 mm Hg and -4,49 beats/sec.

The effects of VibroAcoustic Therapy on the vegetative nervous system is demonstrated, but the inter- and intrapersonal variations observed are too unstable to justify the use of VibroAcoustic therapy as a specific therapy for anomalies in SBP, DBP and P.

## Further research

This pilot study has not taken into consideration the effect of the various software tapes which were used. In the next phase of the research project around the effect of VibroAcoustic therapy
on Blood Pressure and Pulse, one should try to find if there are certain software tapes which induce changes in the measured values in one or the other direction more than other tapes. Positive identification of such software will make it possible to produce therapy programs which will have an increased degree of predictable effects on SBP, DBP and P compared with the programs used in this study.

TABLE OVER CHANGE IN BLOOD PRESSURE VALUES

Group A = values measured after 5 min rest and at end of session
Group B = values measured at arrival and after 5 min rest
Group C = values measured at arrival and at end of session

| Group | Un-changed | N = | Rise m = | Rise sd= | Whole group m = | Whole group sd = | N = | Fall m = | Fall sd = |
|---|---|---|---|---|---|---|---|---|---|
| ASBP | 1 | 24 | 8,92 | 9,94 | - 4,34 | 9,44 | 57 | - 9,98 | 7,65 |
| ADBP | 3 | 22 | 8,86 | 10,58 | - 5,35 | 7,69 | 58 | - 9,09 | 7,66 |
| AP | 8 | 18 | 4,78 | 4,16 | - 4,49 | 7,20 | 56 | - 8,43 | 5,08 |
| BSBP | 4 | 16 | 7,06 | 3,51 | - 4,29 | 9,44 | 62 | -12,74 | 8,94 |
| BDBP | 5 | 22 | 7,41 | 7,73 | - 4,23 | 10,67 | 55 | - 8,51 | 9,92 |
| BP | 12 | 19 | 5,32 | 5,69 | - 3,16 | 7,18 | 51 | - 7,14 | 5,06 |
| CSBP | 3 | 12 | 8,33 | 6,09 | -12,20 | 12,94 | 67 | -16,75 | 9,35 |
| CDBP | 5 | 14 | 6,00 | 7,69 | - 7,98 | 11,23 | 63 | -11,38 | 10,03 |
| CP | 2 | 13 | 5,40 | 5,84 | - 7,40 | 8,25 | 67 | - 9,86 | 5,54 |

Table 4: Effect of Vibroacoustic therapy on systolic and diastolic blood pressure and pulse ( Skille, 1989)

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In respect to the sedative effects and decontracturing effects of the VibroAcoustic armchair emphasized in the technical book, we have used it for 40 patients who were suffering from lumbar regional pains with antalgic limitation of flexion movements and with paravertebral lumbar muscle contracture in different degrees.

> The pains were not accompanied by irradiation to the legs. Osteo-tendoneous reflexes have been normal.

The symptoms appeared in 75 % of the patients from big and long physical efforts, and in the remaining 25 % of the patients they appeared after cold exposure. From 40 patients, 25 were male (62,5 %) and 15 women (37,5 %).

The patients' age was between 25 and 59 years, as it follows:

| | | |
|---|---|---|
| 25 - 35 years | 8 patients | 20 % |
| 35 - 45 years | 24 patients | 60 % |
| 45 - 55 years | 6 patients | 15 % |
| > 55 years | 2 patients | 5 % |

For these patients we have used the frequency tape 69 - 46 - 52 Hz during 10 minutes in 6 subsequent sessions. During the whole treatment period we monitored the blood pressure, the decrease of muscle contractures and the decrease of pain intensity. Before starting the treatment the patients were referred to a cardiologist. None of them had arterial hypertension.

Following the treatment, the blood pressure could decrease by over 5 mm Hg with an average of 3 mm Hg.

In approximately 85 % of the patients the muscle contracture disappeared. In 5 % we have got significant improvements and in only 10 % the contracture was not influenced.

Concerning the pain, in 75 % of the patients it was completely relieved, in 15 % of the patients it decreased significantly and in 10 % of the patients the result was less satisfactory.

In 10 patients treated we combined VA treatment with dyadynamic currents in the formula $PL_4$ $DF_2$ applied before the VA treatment. Here we had very good result even after 4 sessions.

Looking back on our experience, our opinion of VA treatment is : The VibroAcoustic therapy gives very good results in the field of muscle contracture. For the future our aim is to use the VA armchair in different patients groups, to study the results, and to send the results to you.

DR. VIORIL PAVALOAIE (sign)
Head of physiotherapy service

(This report is included by courtesy of VibroAcoustics a/s)
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Excerpts from ENGLISH SUMMARY of 1st Vibroacoustic symposium 1987.
by TONY WIGRAM and LYN WEEKES

REPORT ON A TWO-DAY CONFERENCE AT LEVANGER (TRONDHEIM) NORWAY
13th - 15th March 1987

FIRST PAPER - Øystein Lund (Teacher of Music, Special ed Teacher)

Lund reported on work he has been evaluating to quadriplegi cerebral palsied children. He identified the cause of spasms as follows:

1. Physical - reaction to movement.

2. Pain - causing the same reaction.

3. Psychic causes.

4. General uneasiness, stress, expectation of "what's going to happen now", general anxiety towards pain.

Spasm can be a defense mechanism against external stimuli. One of the consequences of the spasms is pain, and it can be caused by too much lactic acid in the muscle. The way to avoid pain is to work with the client more and pump out metabolic waste products from the muscles. However, pain leads to more spasms which leads to more pain, creating a vicious circle. The circle can only be broken by diminishing or loosing the spasms.

General approach:

Lund is developing a team approach involving music therapy, audiology and physiotherapy. He believes in using the music bath in conjunction with a programme of movement. He uses traditional music and begins by preparing the patient orally for what is to happen. He starts

with the music coming out of the speaker and gradually moves it into the "music bed" in which the patient is lying.

Generally speaking he was using movements much along the lines described in the paper "Music and Movement" (Wigram and Weekes 1983). He is also using music and the Vibro-Acoustic system in a behavioural approach - i.e. stopping hand to mouth movements. Although he found he could stop hand to mouth movements through withdrawing and the stimuli, he felt it was necessary to put something in their place.

Generally speaking, the clients he works with had this therapy twice a week. He has found that the effect last longer that the session itself.

THE MUSIC CONTENT.

Lund has found that using rhythmical, very basic music has a negative and a stressful effect. He found that the emotional context of the music was very important and the music should be of a calm nature. He also felt that the safety and security of the children was dependent on being able to recognise music, and that one should use music they are used to hearing without too much rhythm and with no surprises in it, i.e. bangs or crashes. Music with too complicated a sound pattern should be avoided. When the rhythm is too strict the therapist cannot be flexible. Music should be of an easy,rhythmic pattern to allow half-speed, ordinary speed or double speed handling techniques.

Lund has been using sinusoidal tones (low frequencies) in harmony with the music. He is using amplitude variation at a rate of three to seven seconds between the peaks. He has found that:

If the peaks are too fast, they will interfere with the music. If the peaks are too far apart, there will be no positive effect. He has been working mostly at the 40 Hz level and has found it has such a weak tonality that it can blend with almost anything. The relevance of the music bed gives at least two dimensions to stimulation hearing and touching. In so far as he is reducing pain, Lund has found that the massive tactile stimulus of the "music bed" going into the brain can reduce or block the pain stimulus.

Bio Feedback.

Lund has been measuring pulse and muscle tone through a simple pulsometer and an EMG monitor. He uses the digital pulse meter and has found that the pulse rate was raised and became erratic at first, but was gradually stabilised over the period of time.

EMG

Lund has not been using bio feedback yet and the EMG readouts have shown an initial peaking and then a marked decreasing of the muscle tone.

**SECOND PAPER - Unni Bilden - Physiotherapist.**

Bilden has been using a Music Bed since August of 1986. She works half time in a Health Centre, and half time in a new special school for cerebral palsied children. She has had no previous experience of using music in treatment.

First Client.

Thirteen years old, very retarded, spastic in extremities, self stimulating, has reduced hearing and it is frequently difficult to tell whether he is in spasm or involuntary stretching. Bilden was concerned to identify whether Vibro-Acoustic therapy could help to develop functional movements. She used a cassette with changing sinusoidal tones - 40-60-80-60-40 Hz. The client seemed to predominantly enjoy the experience on the music bed, but on one or two occasions he said he did not like it. He has improved a lot over the last year, and particularly has developed more eye contact and awareness. Of particular significance is that Bilden has found it much easier to do movements with the client on the bed because muscle tone has decreased. As with Lund, she is combining the use of the bed with movement and activity. She is intending to continue using Vibro-Acoustic therapy with this client and will more properly be able to evaluate its effect after further treatment.

Second client.

7 year old boy in a wheelchair. Lacks stability (Athetoid). Good at rolling, enjoys movements. They use sign language with him because he is hearing impaired. Audiologist wanted him to experience vibrations because of his auditory problems. They intend to develop physiowork on M.B.

Third client.

6 years old, flexor pattern in upper trunk and body. Extensor spasms in the legs. Both hips in locked flexed position making abduction difficult.
Again Bilden has combined music, Vibro-Acoustic therapy and movement. She also feels it is important to find music that the clients like and that the client can become more spastic when music is used with which they are not familiar.
Specific results from work with this client have been as follows:

1. The beneficial effect is longer than the school day.
2. The client is more physically active than before.

WORK WITH STROKE PATIENTS

Bilden was concerned here to investigate the reduction of spasms and to evaluate how Vibro-Acoustic therapy could facilitate ordinary physiotherapy work with these clients.

She followed the theory that low frequencies reduce spasms and with aphasia patients she has combined Vibro-Acoustic treatment with movement.

Client 1 - 40 year old man paralysed in both legs, hemiplegia due to a spinal lesion. The client was aggressive and impatient when he first came for treatment in the Physiotherapy Department. Vibro-Acoustic therapy has been effective in enabling Bilden to work with him and to break the spasticity when he is on the music bed. Now he has calmed and very rarely becomes aggressive.

Client No. 2 - 40 year old man, fit, total paralysis of right side also aphasia. He had a very stiff right arm and legs, a combination of dysarthria and aphasia and could only nod or whisper.

Bilden used 68 Hz sinusoidal tones. She achieved distal movements in the music bed which the client could not get spontaneously. He was able to stretch his fingers in the music bed which was impossible on the ordinary bench. There was a break for Christmas vacation, and when he returned he was much worse - overgripping with his right arm. She used 40 Hz to try and get the fingers moving again. After only 5 to 10 minutes she was able to stretch his fingers.

Bilden feels it is very beneficial for this patient to be using the music bed. One possible side issue was that after using the music bed he was able to produce sounds, and began to produce them all way through the vocal range.

Rheumatic patients.

Bilden was working with four clients age range 20 to 25 years.

Patient 1 Painful hips and knees. He was unable to go to work, but after some treatment on the music bed he returned to work.

Patient No.2 23 years old. all joints very painful and on considerable medication. The music bed was influential at first, and they were able to decrease medication. They were using the mid range frequency, 68 Hz.
Unfortunately due to problems of attending hospital (being taken to and from the unit) he relapsed.

Patient No. 3 This patient reported he could identify where the pain was coming from after using the music bed, instead of a general experience of pain everywhere. The sound and the music induced relaxation. The music was unknown to the client, and the pain was reduced during treatment every time except one. This client also noticed that headaches he had been experiencing disappeared during the low frequency sound therapy.
His hunger feelings disappeared, and he became more flexible. (Using Romanowsky's music with a 68 Hz sinusoidal tone)

Patient No. 4 This patient experienced pain in the muscles after the first treatment. This was evaluated and they decided they had to make sure the frequencies were affecting the head and neck area (top of the spine) rather than lower down.

Treatment technique:

Bilden treats her patients for 20 to 30 minutes, and then reduces the sound levels slowly. She then allows them to lie there for two to three minutes at the end of the treatment. She raised queries on how many treatments should be given and for how long. Also in order to evaluate the work, whether to have a period of treatment followed by a gap, followed by a further period of treatment to evaluate the actual effect of the M.B.

Emphysema and Poly-arthritic Patients.

Bilden has also reported on using the music bed on these types of clients. They are chronic patients who have had long-standing treatment. They are using 52 Hz sinus tones as a supplement to physio treatment.

She found that the poly-arthritic patients had relief of pain in the small joints.

With emphysema patients she found that is was easier to excrete sputum - the technique being to give the patient postural drainage first which would bring up as much of the sputum as they can in that position, following which they had a period on the music bed which they found enabled the patient to produce more sputum. These patients felt better for the whole of the rest of the day, which indicates that the relief last longer than with ordinary treatment.

Conclusion:

Bilden felt there were lots of positive results from the use of the music bed and they will continue with their programmes using it.

The use of the bed is contra indicated in cases of acute inflammation, for example during the acute phase of rheumatoid arthritis and other inflammatory conditions such as tendonitis.

She felt it was particularly useful in remission periods for relief of pain. Bilden has also been using the music bed for cystic fibrosis clients, to good effect.

**THIRD PAPER - Margaret Daniell (Music Therapist - Berlin Federal Republic of Germany)**

Mrs. Daniell gave a report on her work with psychotic children and autistic children, and some of her work with adults. She also defined an assessment information chart which she has developed in evaluating the effect of the music bed.

One or two instances she had reported to the Seminar were:

1. A 25 year old male who has fairly lengthy sessions in low frequency sound therapy during which time he will sleep for some period. She reported that he is more attentive after this period.

2. She noted one client she sees who has constipation problems and misses sessions fortnightly for enemas. In this case the client's constipation problems had decreased since the treatment began on the music bed, and enemas were less frequent.

FIFTH PAPER - ARILD HØIE - SYKEPLEIESJEF (Chief Community Nurse) Kåfjord.

Høie admitted initially he had been sceptical of the use of low frequency sound therapy. It had been effective in helping his wife's back problems so he instituted using it with a variety of clients.
Høie was not so much interested in using music, as opposed to just using the sinusoidal tones (Low frequency sounds). He was particularly concerned on their impact on certain illnesses:

Clients

Shoulder pain 68 Hz. He uses treatment for anything between 3 and 4 minutes up to 15 minutes. He lies his clients on the music bed and uses no movements. He believes the clients should move and find the point on the bed which is most comfortable for them to lie on.

Arthritis Group:

Arthritics' patients - pains in the joints, muscle pains of other origins (Mb. Bechterew), tense muscles.
He was dealing with people who had had this ailment for many years, and they are the group who have been using low frequency sound therapy for the longest time. His results are based on the patients' own assessment of their problems. Generally their mobility has improved, the pain has reduced, muscles are softer and they use less analgesics. They have found that the effect of one treatment can last for up to a week.

Tense Muscle Group

Høie has achieved good results in this area, particularly with stretched or twisted muscles. He also noted some contraindications:

1. He stopped treatment when he found clients had inflammation conditions.

2. He also found that using loud volumes with low frequency sound caused choking sensations with one very small client. Treatment using less

volume was beneficial.

## CONCLUSION

Mr. Wigram and Mrs. Weekes were impressed with the two-day Conference, and the professionalism and diversity in approach of the delegates. They have developed a variety of different approaches in using low frequency sound therapy, and were particularly concerned in evaluating effectively its long-term and short-term results. The delegates were from a variety of different backgrounds and areas of Norway, and included for example, one of the top physiotherapists in the country who heads a physio department in one of the main Oslo-hospitals - specialising in head injuries. She is using the music bed in her location with noticeably good results.

The general conclusion is that this is a powerful and unexplored (outside Norway) treatment method, that can be widely applied to various different problems.

Further comments by Mrs. Weekes

I was impressed by the professional development of the Vibro Acoustic equipment in Norway. I made contact with two physiotherapists who are using the "music bed" with a wide range of patients - Unni Bilden, who treats C.P., respiratory problems, arthritic problems, stroke patients. She finds it easier to treat her patients on a music bed because it reduces spasm and pain.
Sigrun Wetterhus, is one of the leading physiotherapists in Norway. She runs the head injuries unit in Oslo and has twenty years experience in the neurological field. She is finding the "music bed" beneficial for her patients.

I would like patients in the mental handicap unit to benefit from the use of vibro acoustic therapy and to research the physiological effects.

A.L. Wigram - Head III Music Therapist, Harperbury Hospital
L.R. Weekes - Senior I Physiotherapist, Harperbury Hospital

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Harperbury Hospital

**Music Therapy Department** **Physiotherapy Department**
REPORT ON THE EARLY STAGE OF THE VIBRO-ACOUSTIC THERAPY PROGRAMME.

20th November 1987

Following the construction and siting of low frequency sound therapy equipment in the C.P.U., Harperbury Hospital, Radlett, Hertfordshire, England, a Seminar week was held at the beginning of October, and Professor Olav Skille from Norway visited to conduct workshops. The workshops were received with great interest in the hospital, and from related professionals in other hospitals locally and from further afield, and the concept of use in low frequency sound in the treatment of certain conditions was accepted as a technique that should be pursued with many mentally handicapped clients at Harperbury. The early results of this work have been exiting in their short term effect of this type of therapy. Evaluations are going to be done on some of the clients specified below, and further considerations given to the frequency of sessions for different conditions, and how long lasting the effect is. Some referrals were made by the staff, and these also highlighted some very interesting results, and enabled us to evaluate more carefully the effect as the staff concerned were able to describe their experience both in terms of immediate outcome and the middle to long term effect.

The following clients are being treated:

| Name | Age | Nature of problem | No of treatments | Tape/ freq. |
|---|---|---|---|---|
| Orly | 29 | High tone CP (Fixed flexion deformities- hips, knees shoulders, elbows, wrists) | 9 49 | 11B 66,56,62, |
| Francis60 | | High tone CP & arthritis | 3 | 11B |
| Rini | 49 | High tone CP with severe deformities : hip & knee flexion, hip abduction with crossed legs. | 3 50,42,66, 42,48,62, | 20A 48 |
| Roland61 | | Circulation deficiency causing purple/black right leg flaking of the skin, indurated areas & a cold, stiff limb. | 4 | 23A 40 |
| Jesse | 78 | Circulation deficiency causing chronic oedema in both legs below knee. | 2 | 23A 40 |
| Vera | 61 | Circulation deficiency causing chronic oedema of right | 2 | 23A 40 |

arm.

| | | | | | | |
|---|---|---|---|---|---|---|
| Emily | 74 | Chronic rheumatoid arthritis | 3 | 3A | | 42,60 |
| Louisa | 50 | Osteo-arthritis, severe back pain. | 2 | 3A | | |
| Robert | 37 | Quadrupledic CP with fixed flexion deformities | 1 | 11A | | 54.48.54 |
| Mark Ryan | 25 | Quadrupledic CP | 1 | 21A | | 68,62,54, 42 |
| Angela | 39 | Athetoid movements | 1 | 37A | | 68,50,76, 68,56 |
| David | 30 | Quadrupledic CP, scoliosis fixed flexion deformity | 1 | 20A | | 50,42,66, 42,48,62, 48 |

STAFF

| | | | | | | |
|---|---|---|---|---|---|---|
| Sue | 40's | Chronic low back pain | 6 | 11A | | 54,48,54 |
| Alison | 20's | Sacro-iliac pain | 4 | 11A | | 54,48,54 |
| Janet | 40's | Stiff neck | 2 | 36B | | 78 |
| Lyn | Late 40's | Stiff neck | 1 | 33A | | 71 |
| Jean | 40's | Headache, sore throat loss of voice | 2 | 36B 78 | 37B | 78,58,70, 68,71,58 |

RESPONSE TO TREATMENT

1. Orly
   In the 6 treatments Orly has received there has been a general reduction in muscle spasm, the worried, frowning expression on her face has disappeared and she smiles during sessions and her shoulders are now relaxed and her chest movements have increased. The treatment has been particularly beneficial for this patient and she has started to spontaneous movements as a result of the reduction in muscle spasm and self motivation. She has also begun vocalising in the sessions and the extent of her relaxation is that she accommodates to the flat surface that she is lying on and rests her head for long periods of time. She began to flex and extend her legs where previously they were locked in spasm, and initiates spontaneous movements with her arms. We intend to continue treatment with this patient, scheduling at least two sessions per week on a regular basis.

2. Francis
   There has been a specific reduction in muscle spasm in the neck, arm,, trunk and leg. After the treatment session she initiated spontaneous movement and after three treatments her respiration had improved and she was laughing during treatment. We intend to continue treatment with this patient on a twice a week basis.

3. Rini
   Due to her gross physical deformities she invariably has a worried frown on her face and becomes very anxious when being moved. She has been considered for a possible operation to release the soft tissues in her legs which are at present crossed due to her abductor spasm. During the course of her treatment, there has again been general reduction in muscle spasm with this patient and we intend to continue the treatment in the hope that an operation may be avoided. She has gross scoliosis which causes rapid breathing, and breathing became easier during the course of the treatment. On one occasion, due to physical distress, the therapist laid her prone and within ten minutes the physical distress had obviously eased and she was smiling.

4. Roland
   During the first treatment, this client's purple right leg improved to a red colour, and he was able to move his ankles a little, and the skin became wrinkled rather than stretched. We consider that the effect of this treatment was sustained as at the patient's subsequent sessions his leg was never the same purple colour.

5. Jess
   We took careful measurements on this patient's legs at given points below the knee and he has now had three treatments and there has been very little change. However, we intend to continue treatment as this is a chronic condition and will probably take time to show any noticeable improvement.

6. Vera
   This lady had oedema of the left arm and at first treatment we elevated the arm and gave her VibroAcoustic therapy with very little effect. Subsequently we treated her with the left arm on the bed and again no noticeable difference occurred. We have stopped treating this patient.

7. Emily
   This rheumatoid lady has very painful joints - both her hands are in splints. It is very difficult to seat her comfortably and she was apprehensive about being lifted on to the bed. We made her as comfortable as we could using several pillows filled with polystyrene beads and after ten minutes she said she was floating up to the ceiling. After twenty minutes her shoulders relaxed and she was able to touch her own nose and she was smiling. After three treatments we found it easier to put her back in her chair. We could bend her hips to 90 degrees and she was altogether more comfortable.

8. Louisa
   This ataxic lady with typical increased lumbar lordosis and rigidity of her spine has arthritic changes in spine and knees. We treated her with a pillow under her head and one under her knees in an attempt to make her comfortable on the bed. After ten minutes of VibroAcoustic therapy she was smiling. When she came down for her second treatment she was very keen to go on the bed again and smiled throughout the whole session. She was treated in the early morning and at 6 p.m. in the evening and she was still pain-free and smiling. Louisa coughed during her treatment and we attributed this to the vibration effect loosening secretions in her lungs. We intend to continue treatment on a twice weekly basis.

9. Robert
   Robert had one treatment only during the week of workshops. He has severe spasticity and the usual worried expression that one associates with the problem. He did not complain during the treatment which for him is a good sign.

10. Mark
    Mark is a heavy, stiff, spastic boy who still retains a Moro reflex. After initial apprehension he showed obvious enjoyment. We have not continued treating him but we feel that it would be beneficial to do so in the future.

11. Angela

Angela is a severe athetoid CP patient. We tried her on the acoustic bed on a day when she had declined to stand in her standing-frame. She was having a bad day and was generally stroppy. During the VibroAcoustic therapy she smiled and patted the top of the speakers indicating to us that she could feel the vibration. She was happy throughout the session and afterwards willingly stood in her flexistand. We have no plan or treatment in future but may use it on occasions to assist her normal physiotherapy treatment.

12. David

David has a severe scoliosis and flexor spasm of one arm. He has a persistent habit of masturbating and we tried him on the VibroAcoustic bed to see if it would reduce the masturbation. During the treatment he showed obvious enjoyment of the treatment and masturbating was reduced although not eliminated. We feel it would be worth while to continue treating him.

STAFF TREATED

1. SUE

Sue had a back problem with sciatic nerve complications and was off work for five months having tried various sorts of treatments. She is now better but left with niggly pains in the sciatic area. We measured her forward flexion before treatment and after and we measured her straight leg raising, left and right leg, before treatment and after and there has been a significant improvement in the mobility of her back and most important of all to Sue, she is now pain free.

2. JANET

Came to work one day with a stiff neck and we tried her on the VibroAcoustic bed. She found some relief immediately but found the maximum benefit some five hours after treatment. We gave her a second treatment the next day and she is absolutely fine and has not been back to us.

3. ALISON

She has a history of sacro-iliac strain. She does a heavy job lifting in the classroom and has occasional niggles but more recently has had an acute spell of pain. She has found great benefit from her VibroAcoustic therapy. She is now more mobile and pain free.

4. JEAN

Jean was given VibroAcoustic therapy for a headache. She actually went to sleep during the VibroAcoustic treatment and was awakened by a noisy patient outside in the corridor but then went straight off back to sleep again. When she awoke there was no headache and she had a great feeling of weightlessness. She was treated a second time for a sore throat and was

surprised to find that she felt the vibrations exactly in the area of the throat and that "scratchy" feeling disappeared.

5. LYN
Lyn sustained a neck injury carrying jerky movement and came to work with very stiff neck. After twenty minutes Vibroacoustic therapy the pain was relieved. Movements were improved but not full. Some five hours later there was no pain and full movement.

6. NANCY
Nancy was given two treatments for pain in the supra-scapular region of the left shoulder and the then opted to return to the Physio Department.

SUMMARY

These results are encouraging, and point the way to a need for more detailed evaluation of the effects of different frequencies and different types of music on specific conditions. The present method of treating involves physical measurement and observed physical responses, and we are concerned in the future to evaluate through autonomic response systems in order to qualify what short and long term effect the treatment is having. We are concerned that it should be possible to specifically identify the level of frequency and style of music that can be "prescribed" for pathological problems. The result will be achieved by some lengthy and detailed research with many different clinical groups.

Tony Wigram Lyn Weekes
Head III Music Therapist Senior I Physiotherapist

.....

Petri Lehikoinen:

**VIBRO-ACOUSTIC TREATMENT TO REDUCE STRESS**

**WHAT IS VIBRO-ACOUSTICS**

The Vibro-acoustic method and equipment were developed and patented in Norway by Olav Skille in the 70's and 80's. The equipment consists of a vibration unit, and audio unit and soft-ware. In this experiment the vibration unit was a bed model. Chair model is also available. As an audio unit we used a set of ear phones.
The soft-ware was produced by Vibro-Soft a/s Inc. This consisted of several types of compositions combined with low sinus tone frequencies varying from 40 Hz to 86 Hz. The effect of pure sinus tone and low frequencies has been known for thousands of years. In several primitive cultures methods and instruments have been developed to treat different psychosomatic disorders or develop an optimum balance between soma and psyche. For

example in the singing technique of Tuvas the effect of the sinus tones in human voice was known. In the shamanistic music the physical vibrations were commonly used. In the past five years several projects in Finland and in Norway have been carried out to survey the possibilities of electronic sinus tones and equipment to produce the same effects, which were known in shamanistic tradition. Now we already know that Vibro-acoustic treatment has been effective in the treatment of stress, insomnia, muscle pains and tensions, rheumatic pains, menstrual pains, reduced blood circulation and neck, shoulder and back pains. Medical research on new application and the control of the counter indications is continued.

**THE IDEA OF THIS PROJECT**

This experiment was varied out in one of the large insurance companies in Helsinki "Kansa Ltd". We had found that there are certain factors, which increase stress among office workers and that this stress can be reduced by organizing the work in a new and better way and by giving a proper educational support to develop a better professional identity. In this experiment we wanted to compare if Vibro-acoustic treatment would also be an effective method to decrease stress in working life.

**THE RESEARCH GROUP**

The project group consisted of three persons. Raimo Vainio was director of the educational department of the Kansa Group and represented the company. Hannu Naukkarinen as specialized psychiatrist represented the Psychiatric clinic of the Helsinki University. He was responsible for the stress and hormonal tests. Petri Lehikoinen as a clinical psychologist and music therapist was responsible for the practical realization of the Vibro-acoustic treatment and educational applications. All directors, health officers and the trade union people in the company were thoroughly informed about all the details before the start of the project.

**THE DESIGN OF THE EXPERIMENT.**

32 volunteer office workers were selected for the project so that it was possible to divide them into two comparable groups according to their age and type of work.
Group one was called an educational group. They attended once a week a training session. In these sessions they received information about the psychological factors on the professional identity and tried to improve their skills in human communication and emotional control. The sessions lasted 60 minutes.
Group two was called a relaxation group. They received Vibro-acoustic treatment twice a week for 25 - 30 minutes at a time. Both programs continued for three months ( 15.2. - 15.5. - 87 ).

The following methods were used to evaluate the results:

1. The normal physical examination
2. Psychiatric interview
3. Spielberger scale

4. Hamilton index
5. Stresshormone analysis (adrenaline, nor-adrenaline, cortisol)

The test subjects were tested both in the beginning and at the end of the research period. The stress hormone changes were measured only from four test subjects because of the cost of this kind of test. The research group was able to get the test results from 13 (out of 15) test subjects in the educational group and from 15 (out of 17) in the relaxation group.

**THE RESULTS OF THE PROJECT**

The hypothesis in this project was as follows:

1. Certain type of education is able to help the workers to stand the stress situations and strengthen the professional identity.
2. Certain type of physical relaxation treatment is able to reduce the situational stress.

The results support both the parts of the research hypothesis.
In the educational group the stress level was reduced on the average of 5,54 points. The level of anxiety was reduced 3,38 points, depression by 2,38, Hamilton anxiety 13,346 and panics 6,36 points per a person.

In the relaxation group the same figures were:
Stress level decreased by 5,07, anxiety 2,53, depression increased by 1,47, Hamilton anxiety decreased 6,87 and the panic anxiety decreased 2,93. The decreasing detail in almost all the tests is obvious. The interesting detail in the very slight increase of the depression in the relaxation group. This probably is occasional, but if it appears to be a constant phenomenon it possibly could be interpreted so that Vibro-acoustic treatment as a fairly mechanical relaxation method is not very effective to change the constructive features of life situation.

The results of the stress hormone analysis show that also the endocrinological functions follow the vibration stimulation. The tests were- however - too few to lead to further conclusions. More measurements are needed.

The primary interest was in the psychological factors, but in the interviews of several persons reported also about the somatic results. Two test persons had a chronic headache which disappeared during the research period. Several persons reported about the decrease of back and shoulder pains. All the test subjects in the relaxation group were satisfied with the treatment and hoped to be able to take part in a new project as soon as possible.

The test subjects in the educational group reported, that the training had helped them in the four following areas:

1. Knowledge and understanding of own work - to some extent.

2. Understanding of the colleagues - too some extent.

3. Improvement of the working skills - to some extent

4. Knowing and controlling stress factors at work - to remarkable extent.

All the participants in the educational group reported their willingness to also receive the Vibro-acoustic treatment.

**ASSESSMENT OF THE RESULTS OF INDIVIDUAL TEST SUBJECTS**

In this chapter the changes in each test subject during the project are analyzed individually. On the following tables points are given in measured factors to each test subject before and after the project. Estimates were made by Hannu Naukkarinen, Licentiate in Medicine, and they follow the international standards. The measured factors were stress, anxiety, Hamilton-anxiety (psychosomatic), and depression. The increase, decrease and stability of a factor and the range of change were estimated.

**CONCLUSIONS MADE THROUGH THE OBSERVATIONS OF INDIVIDUAL TEST SUBJECTS.**

According to the results it seems that in both groups a positive progress was made, but consistently the relaxation group achieved better results. If this trend is also shown in further research projects, it would be reasonable to develop the Vibro-acoustic method to utilize it in working life to reduce stress. In this research the results are not absolutely reliable because of the small number of subjects. Anyhow, the results are promising and encouraging for further research.

CHANGES IN STRESS FACTORS OF EACH TEST SUBJECT.

| Test subject | Relaxation group | Educational group |
|---|---|---|
| 1 | 8 - 8 | 6 - 8 |
| 2 | 4 - 2 | 8 - 5 |
| 3 | 4 - 2 | 7 - 6 |
| 4 | 7 - 9 | 8 - 9 |
| 5 | 8 - 7 | - - 8 |
| 6 | 7 - 4 | 7 - 7 |
| 7 | 8 - 8 | 3 - 2 |
| 8 | 4 - 4 | 7 - 3 |
| 9 | 5 - 8 | 3 - 6 |
| 10 | 5 - 3 | 5 - 8 |
| 11 | 7 - 6 | 5 - 4 |
| 12 | 5 - 5 | 3 - 6 |
| 13 | 2 - 1 | 4 - 3 |
| 14 | 6 - 3 | 8 - 5 |
| 15 | 4 - 6 | - - 6 |
| Unchanged | 27% | 8 % |

**VibroAcoustic Therapy. Reports.**

| | | |
|---|---|---|
| Increased | 20% mean 2,3 | 46% mean 2,2 |
| Decreased | 53% mean 1,9 | 46% mean 2,0 |

In decreasing stress factor the difference between relaxation group and educational group is not big, but noticeable ( in relaxation group 53% - in educational group 46% ). But if the number of test subjects reporting unchanged or decreased stress level are added up in both groups and then compared. the difference is remarkable ( in relaxation group 80% - in educational group 54% ).

**ESTIMATING THE PROJECT**

In the project relaxation and education were found useful. some problems and pressure were caused by the times. sometimes it was impossible for a test subject to withdraw from work, especially the educational group had problems because of the group work and because the program they had was meant to be fixed and systematically advancing. In the relaxation group there was more chances for flexibility because the times were fixed individually. But still all test subjects in this group missed a couple of treatments. In the future we aim at such a system, in which workers could arrange the times by themselves. The equipment should also be near enough so no too much time would be wasted on the way. Besides the bed model there is a chair model which can be placed in any ordinary office. This chair model is also quite soundproof so it could be used without disturbing other workers. Still the Vibro-acoustic treatment should be in medical control to ease research work and because treatment without control might not be regular. It would be a good idea to develop both the Vibro-acoustic method and the education and utilize them together. The results might be considerably better.

**CANGES IN THE ANXIETY FACTOR OF EACH TEST SUBJECT**

| Test subject | Relaxation group | Educational group |
|---|---|---|
| 1 | 0 - 0 | 1 - 3 |
| 2 | 4 - 0 | 9 - 3 |
| 3 | 4 - 2 | 4 - 4 |
| 4 | 4 - 8 | 8 - 7 |
| 5 | 0 - 4 | - - 7 |
| 6 | 6 - 4 | 7 - 5 |
| 7 | 8 - 3 | 2 - 1 |
| 8 | 1 - 1 | 4 - 2 |
| 9 | 3 - 8 | 2 - 1 |
| 10 | 0 - 0 | 2 - 5 |
| 11 | 7 - 4 | 2 - 1 |
| 12 | 0 - 0 | 2 - 6 |
| 13 | 2 - 0 | 4 - 3 |
| 14 | 1 - 0 | 0 - 0 |
| 15 | 4 - 5 | - - 5 |

### VibroAcoustic Therapy. Reports.

| | | |
|---|---|---|
| Unchanged | 33% | 15% |
| Increased | 20% mean 3,0 | 23% mean 2,0 |
| Decreased | 47% mean 2,7 | 62% mean 1,8 |

The anxiety level decreased in both groups. 62% of test subjects in the educational group felt decrease of anxiety, which is much more than in the relaxation group. But if the test subjects reporting unchanged or decreased levels of anxiety are added up in both groups, the result is 80% in the relaxation group and 77% in the educational group. So education seems to have at lest as much effect as the Vibro-acoustic method.

**HAMILTON - INDEX OF ANXIETY**

| Test subject | Relaxation group | Educational group |
|---|---|---|
| 1 | 9 - 2 | 7 - 9 |
| 2 | 9 - 6 | 26 - 9 |
| 3 | 8 - 1 | 22 -20 |
| 4 | 22 -21 | 20 -12 |
| 5 | 10 -11 | - -18 |
| 6 | 9 - 7 | 12 -16 |
| 7 | 8 - 4 | 1 - 5 |
| 8 | 5 - 7 | 16 -11 |
| 9 | 18 -15 | 23 - 9 |
| 10 | 1 - 1 | 12 -18 |
| 11 | 6 - 8 | 30 -22 |
| 12 | 9 - 9 | 5 -19 |
| 13 | 5 - 0 | 22 -17 |
| 14 | 15 - 4 | 14 - 7 |
| 15 | 7 - 7 | - - 5 |

| | | |
|---|---|---|
| Unchanged | 20% | 00% |
| Increased | 13% mean 2,0 | 38% mean 6,0 (4,0) |
| Decreased | 67% mean 5,4 | 62% mean 8,3 |

The difference in decrease is not so clear ( in relaxation group 67% of test subjects while in educational group 62% ). But in the educational group there were quite many reports of

increase ( 38% ). The percentage of test subjects reporting unchanged or decreased values were 87% in the relaxation group and 62% in the educational group.

**CHANGES IN THE DEPRESSION FACTOR OF EACH TEST SUBJECT**

| Test subject | Relaxation group | Educational group |
|---|---|---|
| 1 | 3 - 3 | 2 - 0 |
| 2 | 0 - 0 | 9 - 3 |
| 3 | 0 - 0 | 2 - 2 |
| 4 | 4 - 7 | 3 - 2 |
| 5 | 0 - 0 | - - 6 |
| 6 | 4 - 4 | 7 - 3 |
| 7 | 0 - 0 | 1 - 1 |
| 8 | 0 - 2 | 3 - 1 |
| 9 | 0 - 0 | 4 - 0 |
| 10 | 0 - 0 | 2 - 4 |
| 11 | 6 - 4 | 4 - 8 |
| 12 | 0 - 0 | 2 - 2 |
| 13 | 0 - 0 | 4 - 3 |
| 14 | 1 - 0 | 4 - 2 |
| 15 | 3 - 2 | 4 - 2 |

| | | |
|---|---|---|
| Unchanged | 67% | 23% |
| Increased | 13% mean 2,5 | 15% mean 3,0 |
| Decreased | 20% mean 5,4 | 46% mean 2,5 |

When this table is studied, attention is drawn to many zeroes in the starting values of test subjects in the relaxation group. It could just be a whim of chance, but can also be explained so that the test subjects in relaxation group expected something new and unique and because of that they had a positive attitude. Many in the educational group thought that they were going to take part in conventional in-service training, which is given by the company otherwise and were therefore disappointed. It is worth noticing the decrease of depression factor also in this group.

(Remark by Olav Skille: Using the same additions as in the preceding tables, we find 87% of the test subjects in the relaxation group when unchanged or decreased are added up, while in the education group the corresponding value is 69%)

**DISCUSSION**

This experiment was a first attempt to apply the Vibro-acoustic method in working life. It is quite obvious that there are very many uncontrolled factors in this kind of applied research. Working people cannot take part in project carried out in laboratory conditions. In a business organization like the Kansa-Group, this kind of experiment is also unique. The experiences were primarily positive and the company is ready to continue to develop the method for to

better fulfil the expectations of the organization. There is also much to do to find the best follow-up systems. The hormone tests are a fairly expensive and complicated method for everyday use, but for collecting data for basic research they are necessary. For everyday use the measuring of pulse, blood pressure and EMG should be sufficient. From the acoustical-physical point of view one maybe important finding was made. When we went through the sinus tone frequencies, which test subjects felt most positive and pleasant, we noticed that they fairly often were related to the overtone series of the Index of Schumann. This is the pulsation of the electromagnetic field of Earth ( 8 Hz ). Some examples of these positive frequencies : 40 Hz = 5 x 8 Hz, 7 x 8 Hz = 56 Hz, 9 x 8 Hz = 72 Hz etc.

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Olav Skille

HORMONAL REACTIONS AND VIBROACOUSTIC THERAPY

Glucocorticosteroides like ACTH and cortisol also have an important function as "stress-hormones". One of the effects of cortisol which may be of importance in stress-situations, is the fast mobilization of fat and amino acids and use these as building materials for substances needed by the body - or for energy production. Another explanation for the importance of cortisol is that the presence of glucocorticosteroids seems to be necessary for the optimum effect of adrenaline and noradrenaline on the heart and blood vessels in stress-situations.

Cortisol also has a considerable anti-inflammatory effect. This hormone can prevent an inflammation reaction, and enhance the termination of an ongoing inflammation. The effect is made possible because cortisol has an inhibiting effect on macrofages and white blood corpuscles, thus preventing that these stimulate substances which are active in the inflammation reaction. The permeability of the capillaries is reduced, and the loss of plasma to tissue will be considerably reduced, and is making it more difficult for the white blood corpuscles to penetrate the capillary wall. Cortisol also has a fever-reducing effect.

The anti-inflammatory effect of glucocorticosteroids has great clinical importance, and glucocorticosteroids are today used extensively to reduce inflammation reactions in the body - especially for auto-immune diseases (rheumatic problems f.ex). In these cases we find un-necessary or exaggerated immune reactions from the body, and one has little to lose by reducing the inflammation.[1]

In 1987 there were done some hormone tests in connection with VibroAcoustic therapy at Sportkrankenhaus Hellersen in Lüdenscheid, Germany. The report from this project say that "there is a distinct rise in the stress-hormone level (Cortisol, Beta-endorphine, ACTH) during the treatment".[2]

CONTROLLED RESEARCH - ESTONIA.

An Estonian research team[3] has studied 40 neurotic patients and have come to the conclusion that 10 treatment sessions seem to be the most effective number of treatments. The

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[1] Jacob, Francone & Lossow: Structure and Function in Man. (Norwegian edition). Universitetsforlaget. 1989. p. 318

[2] Droh, Roland & Spintge, Ralph : Letter to T.H. Johansen 15.07.87 : Klinische Erprobung Vibroacoustic-System.

[3] Saluveer,E, Tamm, S., Ojaperv. I.: The use of VibroAcoustic Therapy on 40 Psychiatric patients in the Dept. of Medicine, Tallinn Pedagogical Institute, USSR Estonia.
Paper read at 2nd International seminar on the use of VibroAcoustic Therapy, Steinkjer, 14.-16.4. 1989.

informations have been processed by computer and are within the required statistical probability levels.

The patients were first consulted by various physicians, - therapist, neurologist and cardiologist, and the patients with diagnosis hypertension were treated by the VA-team. Another group of patients were selected by the psychiatrist from the dept. of neurosis in the Psychiatric Hospital of Tallinn.

Patients treated

N= 25. 72% female, 28% male.Age: 21-60 years.

Professions: Leaders of social and industrial enterprises and employees of the same enterprises.

Complaints: Depression, asthenia, hypochondria, hypertension.

Subjective symptom reports: Cry often, Headache, Tachycardia,
Lack of concentration, Restless dreams, Constipation, Indigestion, Easily stirred up, Stomach troubles, Poor appetite, Sweating, Trembling of hands, Apathy.

An analysis of the changes in blood pressure shows the progress of BP changes during the 5 weeks of the described project:

BP syst before treatment, Week 1: >130 44,6% diast >80: 56,0%
after treatment , Week 1: >130 32,0% diast >80: 52.0%
BP syst before treatment, Week 5: >130 47,6% diast >80: 38,2%
after treatment, Week 5: >130 38,2% diast >80: 48,8%

The Estonian research team is summing up their findings by describing the results this way:

1. The treatment of elderly patients was more effective.
2. Women are more easily cured than men (They became less tired, less headache, less distressed, less trembling of hands)
3. During the course of treatment the blood circulation was improved.
   a) acro-cyanosis is diminishing. Temperature of limbs rises.
   b) systolic and diastolic blood pressure drop
   c) Headache and nausea vanish. Improvement of cerebral blood circulation
4. ECG - no remarkable improvement after one procedure, the studies go on in this field.
5. EEG - large individual differences, and it still needs more research.

The effect of treatment is as follows: Rise of self confidence, less stomach troubles, less head-aches, less depression and asthenia. The patients feel better in the job situation.

The Estonian team say that the VA-methods can play a considerable part in the treatment of neurotic patients and patients with hypertension. Good results have already been achieved.