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OVR EIEPERISHCES IN THS TREATMENT OP PATIENTS SUFFERING FROM EXTREMITIS3
ARTERIAL INSUFFICIENCY WITH THS VACUSAC APPARATUS • -

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Abstract

A total of 172 patients have been treated by the application of the Vacusac therapy at the Gaazigradska Banja Institute for Rehabilitation. The treatment had been carried out on a total of 1825 occasions. All the patients in the group had already been treated and clinically assessed in one of a number of residential health institutions and suffered from chronic tissue ischaemia caused by vascular insufficiency. The patients were categorised into four groups according to the disease type and stage as well as to the therapy applied. The examination procedure was the same for all the patients. A complete survey of the patients* biochemical and haematological condition was carried out, they were then subjected to a complete cardiological examination (Electrocardiogram, pulse and blood pressure), oscillometric findings were recorded, occlusive venal plethysmography was carried out, so was the Doppler sonography, auscultative measurements of partial oxygen pressures were taken with the help of transoxodes at foot level and clouding intervals were measured on the treadmill track.

2 The results were then processed statistically by applying the T-test and the X -test and they proved to be statistically highly significant in the group of patients who were treated by the Vacusac therapy only.

Introduction

It is known that the incidence of vascular diseases has been on the increase from year to year both in our country and all over the world. It is quite understandable that the interest in the treatments of these pathological conditions has also been on the increase. Few branches of medicine have acquired so much new knowledge in the field of etiopathogenesis and diagnostics as well as treatment as angiology. Regrettably in spite of all this, we cannot be satisfied with the results of the treatment of chronic tissues ischaeroia caused by vascular insufficiency. Significant results have been achieved in the field of vascular surgery, but only app. 15-20 % of patients can get this type of treatment. Consequently the majority suffer to be treated by one of the conservative methods. The aim of our paper is to evaluate the results of the treatment of peripheral arterial insufficiency with the help of the Vacusac apparatus and to carry out a comparative analysis of these results in relation to the results from the treatment of the same pathological conditions by other methods.

The material and the Methods

A total of 172 patients were treated by the Vacusac therapy during the period from 20th December 1983 to 1st September 1986 with 1825 applications. We tested four groups of patients altogether :

- I. Patients who were treated by the vacuum therapy exclusively using the Vacusac . There were 25 patients in this group.
- II. The second group was the Placebo group, numbering 8 patients.
- III. The patients who were treated by both the Vacusac therapy and some other procedures (hydro-, thermo-, electro- or kinesis therapy).
- IV. Patients who were treated by physical procedures only without the application of the Vacusac therapy.

The majority of patients in the group treated by the Vacusac therapy only (15 patients) suffered from a verified obliterating arteriosclerotic endarteritis, there were then 2 patients suffering from thromboangiitis obliterans, 7 patients with angiopathia diabetica and 1 patient suffering from Raynaud's disease. The patients in all the other groups were treated for the same pathological conditions, but their respective numbers were different.

All the patients were subjected to an identical protocol of examinations before the treatment, after 10 applications and after the end of the treatment. The protocol involved a complete record of the patient's biochemical and haematological condition, cardiological examinations, oscillometry, occlusive -venous plethysmography. Doppler's sonography, auscultative measurements of partial oxygen pressures taken with the help of transoxodes at foot level and measurements of claudication intervals with the patients walking on a treadmill track set at the speed of 5,2 km/h at a slope of 12,5 degrees. All the patients were categorised into the four groups according to Fontain's classification which takes into account the clinical stage of their respective diseases.

The results

In all the cases the same parameters were checked before and after the treatment. As far as the variations in the laboratory analyses were concerned it has been noted that the patients on the Vacusac therapy had a reduced urine specific gravity value recorded. The results of other laboratory analyses had not produced any variations in the patients' either biochemical or haematological condition. The only exception were the glycaemia results for patients suffering from diabetic angiopathies. But no significant variations were recorded for these patients either if they had been taking oral anti-diabetic agents, while the patients dependent on regular intake of insulin had a slight increase in the glycaemia values recorded, but these returned to the initial values after the end of the treatment without any additional quantities of insulin. By comparing the values of the systolic and diastolic blood pressure and the heart beat frequency values during and immediately following the Vacusac application we noted a slight drop in the values of these parameters at the very beginning of the application, but these values would return to the initial levels after five minutes of treatment. By comparative oscillography we recorded a slight rise in the arterial oscillations amplitudes at below the knee and foot level. These variations amounted to an average of 1-2 mm.

On the basis of the results derived from the application of the occlusive venous plethysmography the conclusion can be drawn, that the perfusion of the distal arteries of the lower extremities had improved with almost all the patients. The relative hyperaemia following a 5 minutes ischaemia produced results which were significant.

By comparing the values derived from the measuring of the Doppler index following the applications of the Vacusac therapy we noted an increase in the index value in all the patients, and this after a comparatively short period, i. e. after only a few applications of the Vacusac therapy. This increase was significant in the foot arteries of the patients on Vacusac treatment, which pointed to the presence of spare vascular capacities in this region even with patients suffering from occlusive endarteritis.

The patients on Vacusac therapy had the values of partial oxygen pressure recorded by the auscultative method involving the application of transoxodes (Clark's polarographic electrodes). We tested 11 patients by this method before and after treatment. Analysing the results we came to the conclusion that one can draw the conclusion that the beneficial effects of the vacuum therapy were evident with patients suffering from diabetic angiopathies, particularly if the evolution of the diabetes had not been a protracted one. The same results were recorded with the patients suffering from thromboangiitis obliterans. But these effects were minimal with patients suffering from arteriosclerotic endarteritis, particularly with patients in the advanced age group, because the variations in the partial oxygen pressure are minimal, we also noticed that with patients suffering from Raynaud's disease the values of the partial oxygen pressure were considerably higher, which justifies the application of that particular therapy for patients suffering from this pathological condition 90 % of the patients in the group treated by the Vacusac therapy alone reported that they felt significantly better. This improvement had been reflected in a considerably increased skin temperature, reduced pain and considerably longer claudication intervals. Almost all the patients recorded a considerably longer claudication interval measured on the treadmill track before and after the treatment.

The assessment of the results of the tests on all the above-mentioned parameter; was carried out in accordance with the statistical methods called the T-test and the 2 X²-test. The results recorded revealed that the values had been statistically significant and in favour of the patients on Vacusac therapy only. It is interesting to note that the parameter values recorded in the group of patients who were treated by both the Vacusac therapy and other methods, had also been significant, but that the beneficial effects appeared slightly later than with the patients who were treated by the Vacusac therapy only !

Discussion

Various etiological factors contribute to the incidence of the peripheral vascular diseases. But by far the most frequent cause is arteriosclerosis. With the majority of patients the various degrees of ischaemia in the tissues do not appear as a consequence of changes in the main blood vessels, but also as a consequence of deteriorations at the microcirculatory levels. We have already pointed out that only 20% of patients suffering from these diseases can be treated by surgery, which means that the great majority had to rely on the more conservative types of therapies. That is the reason why a great number of pharmaceutical firms have been fervently competing in manufacturing various preparations whose therapeutic effects are far from identical to those printed in their accompanying literature. The preparations most widely used in clinical practice are, without any doubt, the so-called vaso-dilators. Opinions are divided as to their action and effects in cases of peripheral vascular insufficiency. A certain number of authors believe that they have no positive effect for patients with organic lesions on their blood vessels. On the other hand the general dilatation of the blood vessel system reduces the blood pressure, but this in turn has a paradoxical effect via the

socalled "still phenomenon", because the greatest part of the volume of the circulating blood flows through the healthy regions and the ischaemic zone gets less blood. That is why the search continues for a more suitable method of treating of patients suffering from chronic tissue ischaemia caused by vascular insufficiency. One of the results has been the invention of the VACUSAC apparatus. *The Vacusac therapy is based on the principle of exposing a certain area or the whole human body to variations in pressure (increased pressure-decreased pressure) over a short period of time, which improves the tissue perfusion and eliminates the metabolites from the ischaemic tissues.*

By analysing the results we achieved in treating our patients by the Vacusac therapy and by comparing them to the results of the treatment by other methods, we came to the conclusion that the introduction of this method into clinical practice is absolutely justified. Comparisons with the results achieved by the conservative methods of treatment and by the application of various physical measures, point to the fact that the Vacusac therapy has palpable advantages. On the basis of our 5-year experiences and on the basis of the mechanics involved, one is able to draw the conclusion that the indications for the application of this method are fairly wide. There is no doubt that the widest indication is the peripheral arterial insufficiency, whatever its cause, and this has not yet reached its chronic stage.

- These diseases of the lymphatic and venal system, particularly the post-thrombotic syndromes and the lymphoedema, are a very serious problem for every physician. We have come to the conclusion that the Vacusac therapy can also be used for the treatment of these pathological conditions. Degenerative rheumatics, gout, injuries sustained during sporting activities are additional regions of indications for the Vacusac therapy.

The administration of the Vacusac therapy is fairly simple from the technical point of view. On the basis of our experiences we can say that there are no unwanted side-effects neither in the course nor after the treatment. This is exceptionally significant if one bears in mind that the majority of the patients are in a fairly serious condition and that nearly all of them suffer, apart from the peripheral arterial insufficiency, from another accompanying disease and that there are also numerous risk factors involved.

Conclusion

The Vacusac therapy is a useful and effective method of treatment capable of improving the circulation in ischaemic tissues.

The indications for the application of this method in the clinical practice are wide.

There are no unwanted side-effects in the course of the application.

Compared to the other conservative methods of treatments of the peripheral vascular insufficiency the results achieved by this method are better and statistically significant. It is true to say that our results were recorded immediately after the treatment and that our paper does not refer to any long-term effects of the treatment. Better results are achieved if the therapy is applied during the initial stages of the disease, but once the disease had reached its terminal phase the method has no effect whatsoever.

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