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Acupuncture with shockwaves

A new method for the stimulation of acupuncture points

Abstract

Background Acupressure and acupuncture are very old medical techniques which use pressure sensitive points on the surface of the body in order to achieve an effect on the whole organism. Shockwave-therapy is a new technology, which was initially introduced in medicine to destroy kidney-stones. For several years now, a milder form of shockwaves (ballistic shockwaves) has been in use in orthopaedic pain therapy. Evolved from five years of empirical study, a new method to stimulate pressure sensitive acupuncture points with pneumatically generated pressure pulses (EPAT=Extracorporeal Pulse Activation Therapy) was developed.

Objective The aim was to determine whether the stimulation of acupuncture points with mild ballistic shockwaves is similarly effective or better than acupuncture with needles and which precautions and side effects have to be considered.

Methods In two uncontrolled pilot-studies the effect of EPAT on pain and mobility of joints in gonarthritits and coxarthritits was observed.

Results Even three months after the end of the treatment 72,8% of the gonarthritits-patients still had less pain. The mobility of the knee-joint had improved by an average of 19,1 degrees. The mobility of the hip-joint had also improved. 16 out of 20 patients with coxarthritits were nearly without pain after 4 weeks

of treatment. In both studies the younger patients (under 65 years of age) achieved better results than the older patients.

Conclusion The stimulation of acupuncture points with extracorporal generated pulsating shockwaves (EPAT) seems to be an effective addition to our spectrum of treatment options in acupuncture.

Key words

Acupuncture, extracorporal shockwaves, ballistic shockwaves, pressure waves, gonarthritits, coxarthritits, asthma.

Introduction: Until now, needles, moxa or laser were used to stimulate acupuncture points.

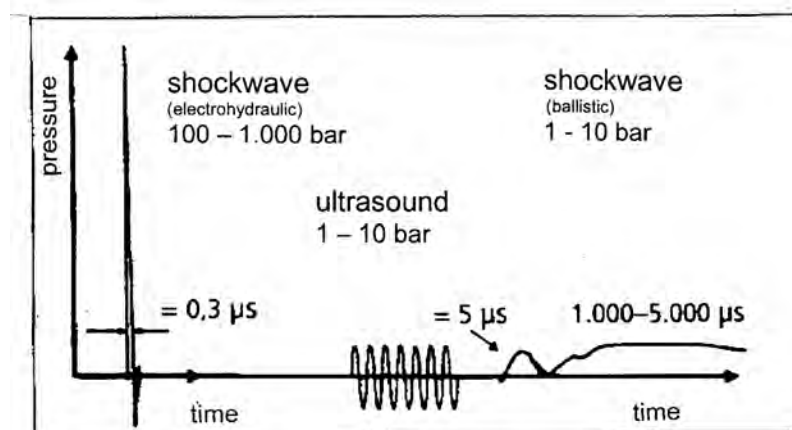
30 years ago a new method, extracorporally generated shockwaves, was introduced for medical therapy. In the beginning these waves were only used to disintegrate kidney stones. Some years later, when smaller devices to generate shockwaves were invented, they could also be used for the treatment of tendons and ligaments or trigger-points and some other orthopaedic diseases. By now this type of treatment is used very successfully, also in veterinary medicine.

The application of extracorporal shockwaves to acupuncture points is a new method of stimulation. I called it EPAT (Extracorporal Pulse Activation Therapy) because it uses mild and short pulses of extracorporal shockwaves to stimulate pressure receptors in the skin, muscles, tendons and vessels to generate reactions that are similar to needles but much more effective in certain cases.

Method:

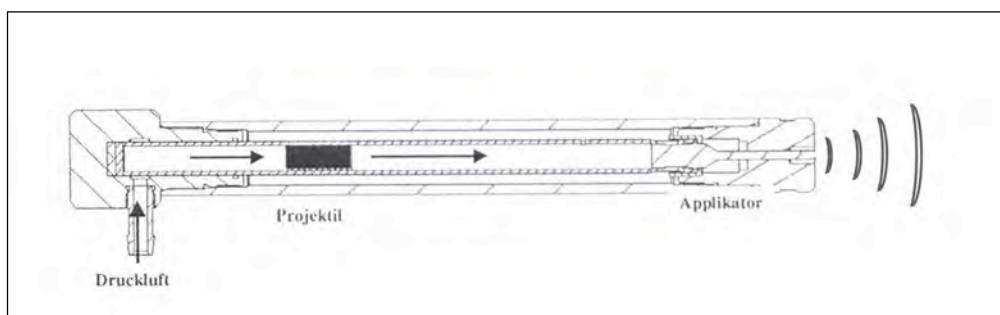
Shockaves are acoustic waves which we know for example from thunderstorms or bangs of an explosion or the bang that occurs when a supersonic aircraft hits the sound barrier. Their energy

can cover long distances. Solid material and water are excellent conductors for this type of waves, whereas wave propagation is severely inhibited in air. In this they have some similarity to ultrasound waves but their power is 100 to 1000 times stronger. There are two different types of shockwaves that are used in medical treatment: Electrohydraulic shockwaves and ballistic shockwaves. (3,6,7)



Electrohydraulic shockwaves are generated by an electric spark. If the spark discharge occurs in water, the pulses thus generated can be focussed and directed at kidney stones, for example. They penetrate the skin without causing any lesions. The devices used for these applications are very big and the energy output is very high.

Ballistic shockwaves are generated by a projectile which is shot against the rear side of a small metal plate. This plate, i.e. the applicator, applies the pulses to the target. Ballistic shockwaves are milder than electrohydraulic shockwaves. The devices to generate these waves are much smaller and easy to handle on the skin. That was the reason why I decided to use them for the stimulation of acupuncture points.



The device with which the following studies were carried out was a MASTERPULS 100 of the STORZ MEDICAL COMPANY of Switzerland on which the applicator was adapted to the use on acupuncture points. The tip of this special applicator had a diameter of only 6 mm.

Initial studies and applications

Gonarthrititis

Since 2001 first observations have been made on the treatment of different cases of painful joint affections with the new technique.

In the time from October 2003 to May 2004 my first uncontrolled study took place. 22 patients who suffered more than 6 months of gonarthrititis, which had been confirmed via arthroscopy and radiology, were admitted. The patients were between 30 and 88 (average 64,5) years of age (12 male, 10 female).

Patients with an acute inflammation of the knee were not included.

It was investigated whether the stimulation of acupuncture points using ballistic shockwaves achieved results as good as those comparable to needle acupuncture.

The selection of points for the application of shockwaves was the same as with classical acupuncture.

The typical combination of points was: BI40, Gb34, St36, Sp6 Sp9 and three local points around the patella.

Every point was stimulated three times with shockwaves for 5 to 10 seconds, which means that 30 to 60 impulses were directed at every point. The pressure was high enough to produce a feeling of vibration in the area. The stimulation was stopped when the patient felt any pain. The treatment was repeated every second or third day. Most of the patients had 12 treatments or less.

They were 12 men and 10 women, who were diagnosed by their orthopaedist as chronic arthritis of the knee-joint.

They were asked for pain when moving and pain at rest. Pain was evaluated with the aid of a questionnaire on a scale from one to ten before the treatment and after the 6th and after the 12th treatment. The range of movement of the knee-joint was measured by the “normal-zero-method” before and after the treatment. It was also asked about the distance which the patients could walk before and after the treatment.

3 months after the end of treatments the patients were asked again for the long time results.

Results:

In the beginning 10 of the 22 patients had pain even without moving the knee. After 4 weeks only 2 patients had complaints of pain in rest.

Pain while moving the knee was reported by all the patients on a scale from 1 to 10 at an average of 6.5 .

Two weeks later the severity of pain was reduced to 2.8 and after 4 weeks it was reduced to 1.8.

8 Patients of the 22 were completely without pain after 12 treatments. The youngest patient, a man of 30 years, had no pain any more after only two treatments. Two patients reported some aggravation of pain after two or four treatments and stopped their cooperation.

The range of mobility of the knee joint, which was measured by the Normal-Zero-Method at the beginning and at the end of the treatment, had improved on an average of 19.1 degrees. The younger the patients were, the better was the effect.

Also the walking-distance seemed to improve, but measuring this parameter was too uncertain under the circumstances of this study to take it into account.

After three months 16 patients (72,8%) still reported good results.

The results were better than my results with needle acupuncture alone. The speed of improvement, the extent of pain reduction

and the relief of contractions was very good especially in younger (under 65 years of age) patients.

The complete study was published in the German Journal of Acupuncture in 2/2005. The statistics can also be found on my home page.

Coxarthrititis

Encouraged by the results of my study on gonarthrititis, I started a second uncontrolled study on the treatment of coxarthrititis. 20 patients with chronic pain in the hip joint were admitted to the study. It was investigated whether the sole stimulation of acupuncture points using ballistic shockwaves was able to reduce pain and improve mobility of the hip joint. The selection of points was based on the Chinese syndrome-diagnosis. Usually the following points were selected: BI23, BI25, Gb30, Gb29, Gb31, and Gb34. Depending on the modalities of the disease, some personal points could be added. Altogether no more than 12 points were selected. The treatment was repeated every second or third day over two weeks. After 6 treatments most of the patients had significantly improved. In some cases up to 12 treatments had to be done.

Results of EPAT-Treatment for Coxarthrititis:

Patients younger than 65

Patient Nr.	Age/sex	affected side	treatments	results
1	62/ fem	left	12	no pain
2	62/ fem	left	10	no pain
3	65/ male	left	5	no pain
4	57/ fem	left	8	no pain
5	50/ male	left	11	better
6	62/ fem	both	12	better
7	50/ fem	left	4	no pain
8	55/ fem	left	4	no pain
9	55/ fem	left	12	no pain
10	60/ fem	left	6	no pain
11	60/ fem	left	7	no pain
12	60/ male	both	12	no pain
13	65/ fem	left	9	no pain
14	62/ fem	left	4	no pain
15	40/ male	right	6	no pain
16	60/ fem	right	4	no pain

Patients older than 70

Patient Nr	Age/sex	affected side	treatments	results
17	80/ fem	both	12	no effect
18	80/ fem	both	6	no pain
19	70/ fem	both	12	no effect
20	85/ male	left	5	no effect

The complete study was published in the German Journal "Erfahrungsheilkunde" in 2005.

The results altogether were even better than with gonarthrosis. 16 out of 20 patients were nearly without any pain after 4 weeks. Only 6 patients needed 10 treatments or more. The patients with the better results were younger than 70 years. This means that older patients who suffer of prolonged coxarthrosis with destruction of great parts of the joint will still need an endoprosthesis. Nevertheless it seems to be worth trying an EPAT-treatment before the patient has to undergo an operation.

Side effects

So far over 1000 EPAT procedures were performed without any clinically relevant side effects, provided that the intensity of the pressure pulses was selected correctly. Areas located directly above bones (e.g. skull) were avoided because of the sensibility of the periosteum. Areas above the lung or large blood vessels were avoided because earlier experiments with the very hard electrohydraulic shockwaves had caused some ruptures of vesicles in the lungs of animals and there was some theoretical danger of mobilizing plaques or thrombs in the larger vessels. The stimulation of an inflamed area could lead to increasing pain and therefore should be avoided. In very few cases small haematomas at the treated acupuncture point could be observed especially when patients were under anticoagulants.

Discussion

There are some different theories about the anatomical and histological correlate of acupuncture points. And there are different theories about the mechanism of action that is provoked by inserting a needle into a point. Pothmann (5) suggests that acupuncture points are composed of a great number of different receptors (pain, temperature, pressure receptors). In the case of ballistic shockwaves especially the pressure receptors are stimulated.

From my point of view the reason why mild ballistic shockwaves had an advantage over the acupuncture with needles was that they reach a greater number of pressure receptors in the tissue with higher pressure than needles and that these pressure receptors are stimulated by their adequate stimulus. They "understand" the message better. Additionally many of the main acupuncture-points for the treatment of pain and stiffness of the hip and knee are either quite big in diameter as for example Gb30, or points with the same indication are located very close together as for example the points Liver8, Spleen9 and Kidney10. The pressure impulses reach all the pressure receptors in the area simultaneously.

In the case of gonarthrosis and coxarthrosis the stiffness of the joints that is caused by the constriction of muscles and tendons is the main reason for pain. The destruction of cartilage is a further step in the process. (4)

Ballistic shockwaves, which are aimed to the most sensible accumulations of pressure receptors that are connected to the joints (the acupuncture points) can cause a reflex that is able to widen the contracted capsule of the joint. This mechanism could explain why the treatment was more successful in younger than in older patients.

Conclusion

The results show that pain and the reduction of mobility in arthritis of big joints principally can be treated by mild ballistic extracoporal shockwaves (EPAT) that are directed to acupuncture points.

But pressure receptors are not only located in tendons and muscles, but also in the skin and connective tissue and many other areas of the body. Pressure pulses allow a variety of body reactions to be controlled: Muscular tension, dilatation or constriction of blood vessels, bronchial dilatation or constriction, intestinal activity, bladder activity and so on.

Consequently, the list of indications for this type of therapy is very long. Until now I have collected data on the treatment of the following diseases:

- Arthritis of large joints
- Bronchial asthma
- Cervical syndrome
- Foot reflex zone therapy
- Incontinence
- Carpal tunnel syndrome
- Lumbago
- Tension headache
- Tennis arm
- Calcaneal spur
- Tinnitus
- Wound healing disorders

The principles for the selection of the points to be treated with EPAT are the same as those followed in classical acupuncture. Similarly to classical acupuncture, EPAT also allows the intensity of stimulation of an individual point (stimulating or sedative) to be controlled by using either weak pulses that have stimulating effect or strong pulses with a sedative effect. Moreover, the new

therapy method can be easily used in combination with classical needle acupuncture and all other therapy methods.

The question if this way to stimulate acupuncture points is really more effective (as it was my impression from my own observations comparing needle-acupuncture to EPAT) must be answered by further controlled studies.

Summary

Extracorporeal Pulse Activation Therapy in acupuncture is a new procedure for the stimulation of acupuncture points. EPAT complements traditional methods such as moxibustion, acupressure, laser acupuncture and electro-acupuncture and thus extends the spectrum of therapy options that are available today for the treatment of acupuncture points. Further studies will be necessary to identify the diseases for which EPAT may complement classical needle acupuncture and to determine additional applications in acupuncture that are opened up by this new therapy method.

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