From laser research

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LASER WATCH – SIMULTANEOUS LASER ACUPUNCTURE AND LASER BLOOD IRRADIATION AT THE WRIST

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Summary

Laser medicine in general has experienced enormous progress over the last years. The latest innovation is a so called laser watch, a system only slightly larger than a wrist watch. The laser watch is applied to the wrist, where simultaneous and continuous acupuncture point or blood irradiation using laser light can be performed This results in new and promising therapeutic approaches for different diseases. This article introduces and briefly discusses the first pilot measurements with regard to the laser watch. However, in the authors' opinion, further research is absolutely necessary before the laser watch is widely used.

Keywords

Laser, watch, laser acupuncture, laser blood irradiation

Introduction

In the field of medicine, it has always been attempted to combine different methods and procedures for the benefit of patients in order to achieve improvements with regard to their diagnostic and therapeutic possibilities. The miniaturisation and practicability of individual systems and system components therefore also plays a large role. An extremely good example of this is the new laser watch, which on the one hand implements laser acupuncture [1] and laser blood irradiation [1] in the area of the wrist in parallel, and on the other hand, represents a piece of practicable and appropriately-dimensioned equipment.

We should mention now that there are currently a variety of different "LASER watch" systems available which are mainly produced in the Asian region. However, according to the current state of knowledge of the authors, the quantifiable effects of the stimulation methods (laser acupuncture and laser blood irradiation) have never been recorded.

Within the scope of this paper, an innovative laser watch which is produced in China and available in Germany from "Weber medical" is presented for the first time in context with initial scientific data.

Methods, technical aspects and possible indications

The technical data for the laser watch is listed below. The laser comprises of a GaA/As semiconductor and operates with a wavelength of 650 nm. The laser installed in the watch comprises of 10 individual laser beams for the wrist and an additional adapter for nasal stimulation. The power at the output is 5 mW, but can be adjusted. The device operates at an ambient temperature of -20°C – +40°C and a relative humidity of ≤85%. The atmospheric pressure should be between 86 - 106 kPa. The laser watch can be used with a variable irradiation period of 10 to 60 minutes (Fig.1) [2,3].

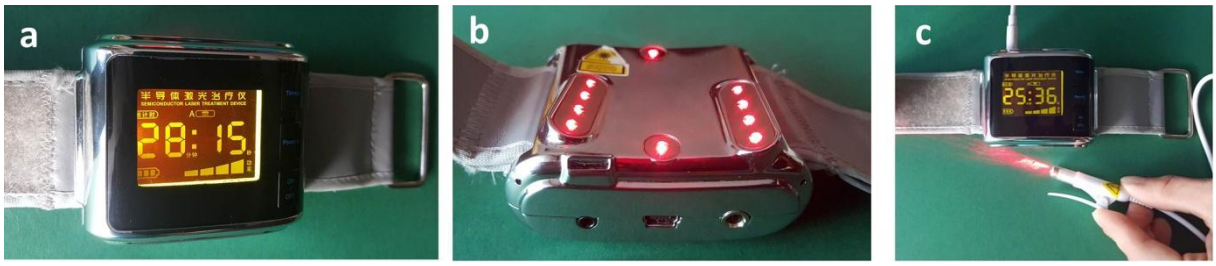

Fig. 1: Laser watch for laser acupuncture and laser blood irradiation (front (a), rear (b) and view with nasal adapter (c)).

The features of the device are described as follows: Energy-saving, processed in light-weight carbon, environmentally-friendly and easy-to-use operation. Furthermore, the low energy consumption and long-lasting performance of the device is praised. The device has a colour LCD. The small size and therefore low weight are positive features, meaning that the device can also be easily transported [2,3].

According to a website which advertises this product, the laser watch is not suitable for cancer patients, pregnant women or people with haemorrhagic diseases. Children should only use the watch under the supervision of an adult. It is recommended that elderly and

sensitive people perform the therapy at low power and for a short period at first. The strength and duration can then be individually increased or extended according to the reaction of the body [2,3].

According to the quoted sources, the laser watch is, amongst other things, suitable in case of hypertension and diabetes mellitus. Furthermore, the laser watch should serve the treatment of cerebral thromboses and strokes, and for the prevention of sudden cardiac arrest. The laser watch should also be used in the field of pain medicine. As a result, general pain conditions as well as sports injuries, wounds, broken bones, arthritis and joint pain should be treated using the laser watch. In addition to this, according to the stated sources, the laser watch can be used with the nasal stimulator (see Fig. 1c) for different forms of rhinitis (allergic rhinitis, acute rhinitis, chronic rhinitis), and also for sinusitis or in case of nasal polyps. According to the manufacturer, hyperviscosity syndrome, hyperlipidemia, hypertension and various cardiovascular and cerebrovascular diseases are also valid further indications for use [2,3].

As already mentioned, the laser watch irradiates defined acupuncture points on the wrist. In this process, the laser penetrates the vessel walls with a wavelength of 650 nm. The tissue under the laser watch absorbs the energy of the laser in order to produce lipoprotein lipase. Subsequently, the microcirculation and the oxygen transportation capacity of the red blood cells are improved. As a result, the blood is cleaned, and the insulin secretion can, according to the manufacturer information, attain a normal level once more [2,3].

As already mentioned, the laser watch can also irradiate the inner area of the nose using the adapter included. The inner area of the nose comprises of a multitude of capillaries. The nerves in the nose are stimulated, the blood circulation in the skull is improved and in total the local microcirculation is thus improved. Furthermore, as a result of the stimulation, more oxygen should be made available in the brain [2,3].

The main function of the laser watch is the irradiation of the A. radialis, the A. ulnaris (Fig. 2), the Neiguan acupuncture points and further acupuncture points (Fig. 3). Therefore simultaneous irradiation of important regions of the body can be provided. The device includes an automatic switch-off function in order to ensure that the precise stimulation time is observed. It has been constructed in a shape especially adapted to the human wrist in order to guarantee a perfect fit. Several devices have two output modes (pulsating and continuous) [4].

However, the manufacturer [4] also states several warnings regarding handling of the laser watch. Looking directly into the laser beam is, of course, to be avoided. Likewise, handling the active laser watch without the corresponding protection equipment (glasses) is also hazardous. According to the manufacturer data, use of the laser watch is prohibited for patients with a cardiac pacemaker – for reasons unknown [4].

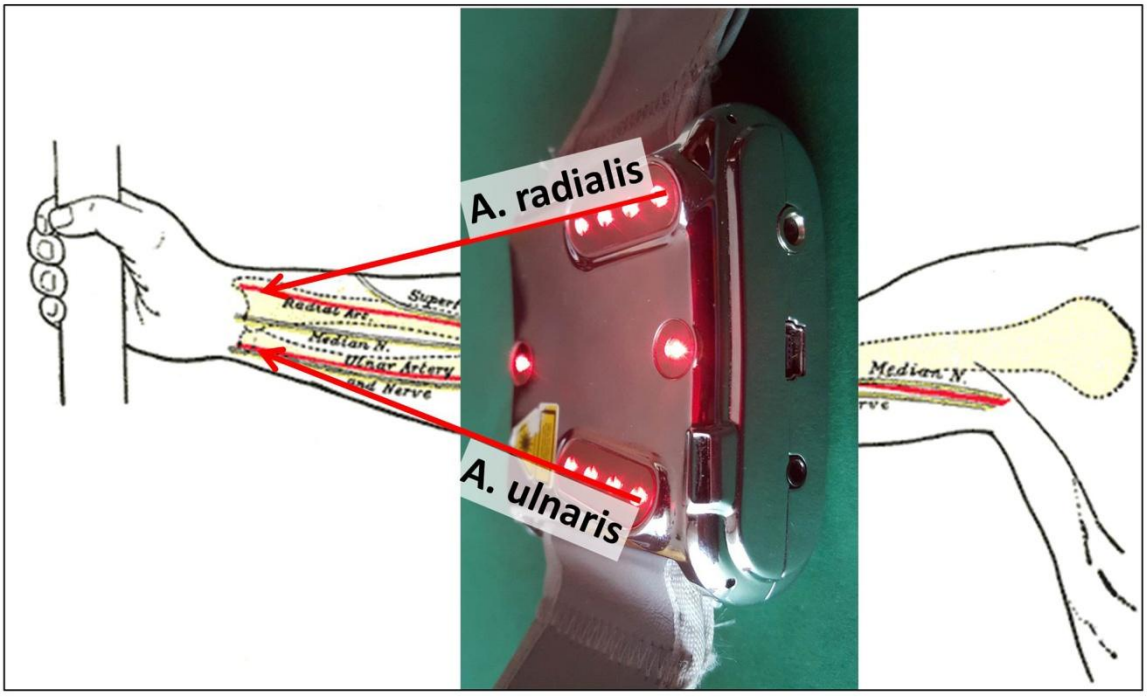

Fig. 2: Laser blood irradiation with the laser watch.

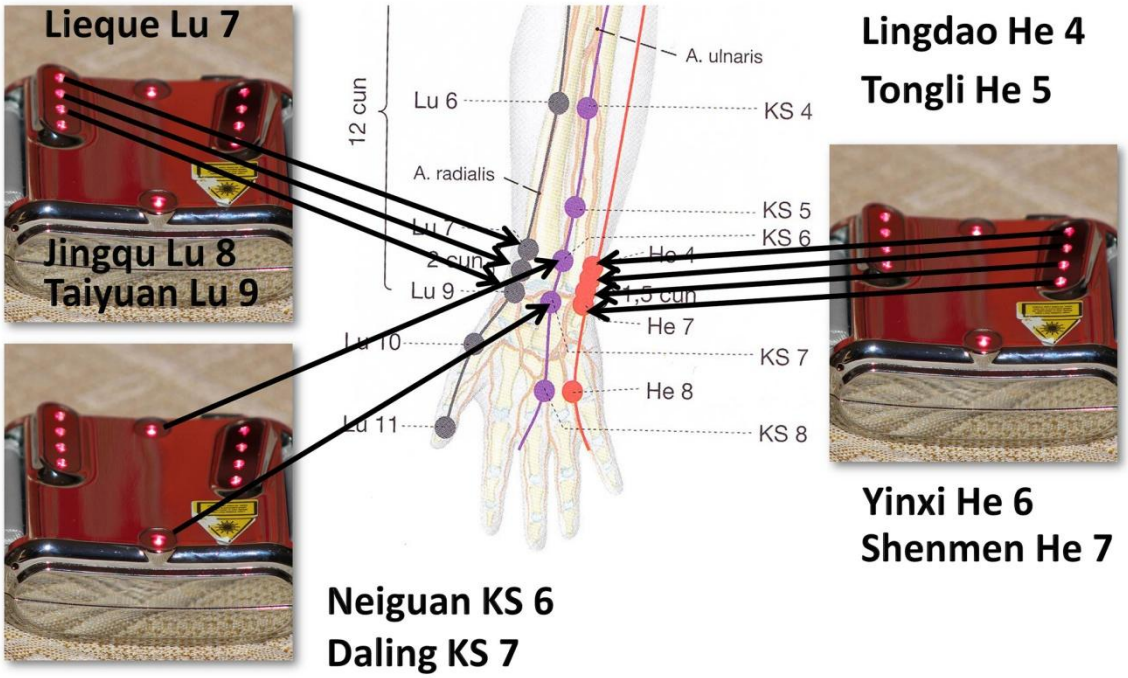

Fig. 3: Acupuncture points which are stimulated through the laser watch (mod. from [5]).

Current scientific research regarding the laser watch

Within the scope of pilot trials of our research group, it was proven that the absolute Heart Rate Variability (HRV) increases temporarily during stimulation with the laser watch in healthy test persons (see Fig. 4). However, after completion of the 20-minute stimulation, the HRV reduces again to the initial level.

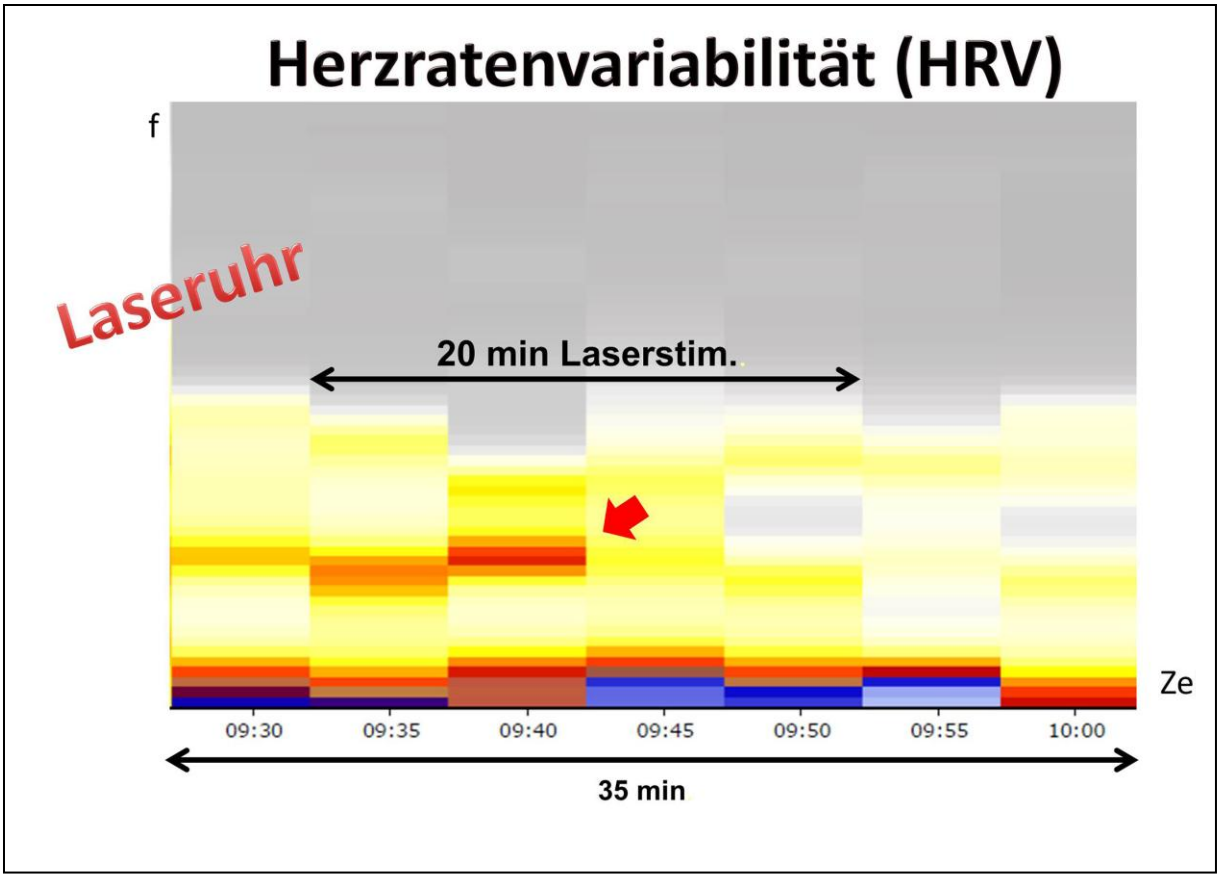

Diagram:
Heart Rate Variability (HRV)
Laser watch
20 minute laser stimulation
Time

Fig. 4: Heart Rate Variability during laser watch stimulation. An increase in the frequency band 0.05 – 0.15 Hz (arrow) can be observed, in which amongst other things, effects on the blood pressure check system manifest themselves during the optical stimulation. X-axis: Time, Y-axis: Frequency (f).

If the data of this study is compared to that of previous ones, in which red laser, amongst others, is also used in a similar wavelength range (658 nm) at the Neiguan point, then it should be mentioned that the HRV did not increase significantly under red laser stimulation in the initial study. The effect of the increase of the HRV during irradiation with the laser watch is possibly attributable to the simultaneous stimulation of both the Neiguan (and other points) as well as the A. radialis having a summation effect on the HRV [6].

According to the manufacturer, a further important point is the improved microcirculation which can be generated by the laser watch. Numerous publications already exist pertaining to this subject which describe [7] the verified improvement of microcirculation with use of yellow lasers, for example. Such fundamental research must, of course, also be performed with the laser watch which operates using red laser light. Initial indications of an improvement in microcirculation resulting from the laser watch have been documented (see Fig. 5.), but large-scale studies are still lacking.

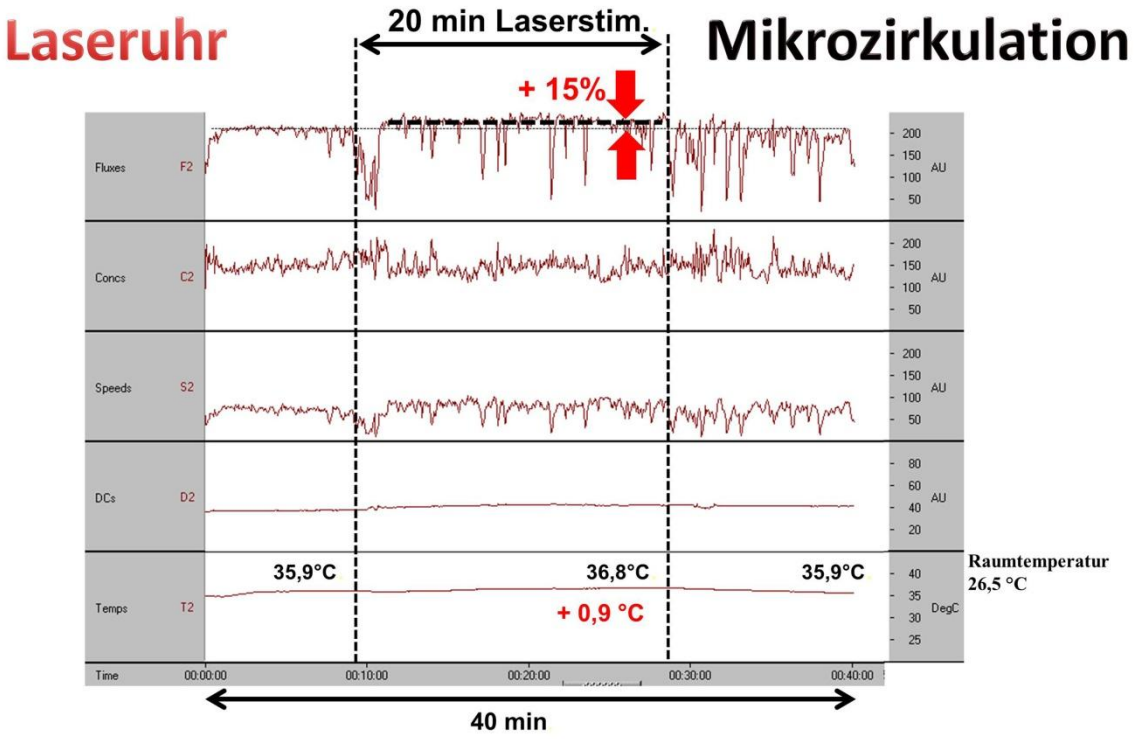

Diagram:
Laser watch 20 minute laser stimulation Microcirculation
Room temperature

Fig. 5: Improvement of the microcirculation (increase by 15 %) during a 20-minute laser stimulation through the laser watch. Simultaneously, a temperature increase in the area of the fingertip of the index finger can be observed.

Besides the optical irradiation of the popliteal area [8], through which Campbell and Murphy were initially able to determine a shift of biological rhythms via the body temperature and melatonin concentration [9], laser blood irradiation and laser acupuncture by means of a “watch” in the area of the wrist provides a non-invasive, practicable method. The professional use of the laser watch appears to generate physiological effects, the scientific verification of the method is currently being undertaken, but only in part, meaning that a significant need for research still exists.

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