SCIENCE OR PSEUDO-SCIENCE?

Review of published article

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The German medical journal Therapiewoche (publisher Verlag G. Braun, Karlsruhe), one which lays claim to credibility, published an editorial in its issue No. 39, 49 (1989) under a heading which read: 'Low-power lasers: Humbug or therapeutic light?' The contents of this article were meant to be an epitaph to LLLT medicine. There was someone who would have that laser light biostimulation does not exist. The intention was to ridicule laser therapy. Various assumptions, presumptions and speculations were said to constitute the true and proper science. Graduate engineer Claus Schwing of Frankfurt, West Germany, is the author of this compendium on laser therapy. The scientific problem appears simple, summarized by him as: Laser therapy is humbug! From a question mark in the heading, the text of the article advances to a statement of fact!

In the following the major passages of Mr Schwing's article are summarized (in translation by the author DK) together with my reply, which unfortunately was not printed in Therapiewoche. I leave it to the reader of Laser Therapy to draw their own conclusions.

Inspired by the method-revolutionizing march of triumph of laser technology, clever manufacturers have conceived laser machines for 'gentle' healing. Accompanied by a flood of 'scientific' publications and beset by an expectant clientele, many a doctor has converted from orthodox medicine to paramedicine, has joined the ranks of the army of 'alternative' healers and has let his patients partake of the miracle drug, laser. But the advertised successes have not materialized.

The 'soft laser'

This 'gentle', 'soft' medical laser, so named by an ingenious manufacturer presumably in imitation of creamy soft ice cream and so established in the (German) language, promised to revolutionize medicine. Inspired by the impressive march of triumph of the surgical laser beam, its offspring wanted to share in the triumph as well. And the womb was fertile, the magic word laser after all electrifying wide circles, this technology of the future giving rise to euphoria. Representatives of 'alternative' medicine eagerly pounced on the new method.

Thus 'scientifically' legitimized by a flood of dubious publications and beset by an expectant clientele, many an upright doctor converted from orthodox medicine to paramedicine and let his patients partake of the miracle drug laser.

Then came the long-awaited hour of the manufacturers. A good four dozen laser suppliers, among them any number of hastily formed garage companies, pressed into the expanding market. From the scantly encased laser tube costing DM 3500 to the chrome-gleaming laser cannon weighed down with sparkling fittings for DM 35 000, the market offered a hodge-podge of apparatus.

Accompanying the inflation in different versions, the low-power laser (helium-neon laser in the red visible range of the spectrum) was joined by a middle-power laser (gallium arsenide laser, close to the infrared range). The laser apostles outdid each other with ever more adventuruous successes of treatment. Far removed from all biophysical principles, crazy ideas of the effect of the reaction of laser light in biological substrate made the rounds.

The KBV (federal association of panel doctors in Germany) could have saved itself all the haggle. And many a doctor could have been spared costly misguided investment. Because instead of demanding clinical studies from the laser protagonists, the supreme board of panel doctors gave itself content with mere reports of experience and case examples, 'We were not in possession of any scientific work which might have rendered the therapeutic effect of low- or middle-power lasers in question', went the justification afterwards.

For all that a call to Berlin would have sufficed. 'To date the protagonists have not succeeded in putting together double-blind studies', assert the two laser experts of the Berlin 'Laser Medicine Center', engineer Professor Gerhard Müller and physician Professor Hans-Peter Berlien. 'What has been presented to us as double-blind studies just weren't'. As before, they lacked clinically sound documented proof of action for applied laser biostimulation.
Placebo forte: the illusion of laser treatment alleviated tendopathic distress

‘One constantly stumbles over them, there’s a lot that’s hard to swallow’, is the way Munich laser surgeon Dr Werner Siebert describes the shrill tidings of laser healing. For want of scientifically grounded studies, Siebert and his work colleague, Dr Niclas Seichert of Grosshadern Medical Center, took the offensive. They wanted to get to the bottom of matters and launched a clinically controlled study, a double-blind experiment. The result of the investigation on two groups of patients, all suffering from tendopathic diseases, was that about a third of those treated with low-power laser reported distinct alleviation of pain persisting for several weeks. Proof of efficacy? Not at all!

Among the placebo group, who were exposed merely to the illusion of laser treatment by the flickering pilot lamps of the laser gun, this itself being switched off, the success rate was entirely identical. The alleviation of distress attained, as summarized by Siebert, ‘has no causal connection with laser irradiation’, which ‘has no effect of any kind’, whereas ‘the placebo effect must be rated high’. It was the ‘suggestive component’ that made the difference.

Suggestion may be suspected of playing a part also when the Munich working group attended to patients suffering from non-articular rheumatism. The result of the double-blind study undertaken by the group with low-power lasers, this time with additional crossover between the test groups so that all patients received both actual and simulated treatment, was: ‘An action of the infrared laser that goes beyond the placebo effect’, as Seichert stressed, ‘is not recognizable, not even in tendency’.

The test procedure and the design of the test in any number of so-called double-blind studies made in the low-power laser field were inadmissible, Berlien also criticized. He considered crossover comparison within a double-blind study running over an extended period, as conducted by Gartner, to be ‘not meaningful’. In such a case the results for the groups mingled into a worthless brew.

‘Unfortunately’, states Berlien, all allegedly positive double-blind studies on the problems of irradiation lasers submitted to him to date were not that at all: ‘We were unable to duplicate the results’.

Whereas Professor Michael Landthaler, dermatologist at the Munich Dermatology Clinic and a participant in the study, applies ‘no clinical relevance’ to the results of animal experiments, Hungarian radiologist Dr Adam R. Mester views the laser-induced regeneration of vessels as the long-desired rehabilitation of the discredited irradiation laser: ‘That must surely influence the colleagues who as yet do not believe in the laser’.

Mester at least is already a believer. ‘All kinds of inflammatory processes’ could now be overcome.

‘We probably generate a membrane signal’, the doctor from Budapest fantasizes, thus ‘triggering cell functions’ with the low-power laser. Mester, who holds the rank of a high priest among low-power laser apostles, is called a ‘dreamer’ by orthodox physicians.

Dr Diether Haina, a physician at GSF, has penetrated beyond the stage of the cellular plane into the complex organism. Admittedly there are no statistically supported results as yet. But with careful selection of the power density and output energy, a ‘distinct wound cleansing effect’ with laser light in treatment of leg ulcers was to be observed on every other patient.

It was however necessary for the wounds to be carefully bandaged again and again. Very difficult but not hopeless is how Haina defines the use of the athermic laser for accelerated and thus increased formation of granulation tissue for wound closing. Animal experiments which he conducted together with the Munich Dermatology Clinic appear to confirm his assumption.

Landthaler contradicts Haina’s optimistic assumptions. ‘We have experimented a lot’ and what emerged from that ‘has (contributed) nothing substantial’ to the therapy of leg ulcers. And since all experiments were ‘never properly reproducible’, he had finally abandoned the use of laser light of low power density in his specialty because of its blatant ineffectiveness.

In sum: The costliest placebo in medicine

Also abandoned was a long-term project of GSF, ‘biostimulation through light’, under the direction of Professor Wilhelm Waidelich. Whether acne, the most frequently announced indication for lasers, leg ulcers or sebaceous glands, sperm or bacterial cultures were exposed to the cuddly soft laser light, the effect was always the same: nothing.

And a study made by the Grosshadern working group on patients following surgery to the knee and hip joints could confirm neither accelerated wound healing nor a favourable effect on scar formation under low-power laser treatment.

‘Prescription of a placebo is often better than medical advice’, is the way psychotherapist Dr Josef Wagensommer stands up for the hoodwinking ally of the ‘doctor drug’. ‘The deliberate prescribing of a placebo’, as Wagensommer expounded in a professional journal, ‘can be appropriate in some respects’.

Critical review of the article ‘Low-power lasers — humbug or therapeutic light?’

Despite a certain knowledge of laser medicine, its development, and the international laser scene, I
was surprised at the superficiality pervading your article. In contrast to the practical, clinical and therapeutic results, the scientific study of the interaction of low-power laser light and tissue is certainly incomplete. The reason is the complexities affecting evaluation, which is based for the greatest (and worst) part on interviewing patients about improvement or worsening of their subjective distress. In the case of low-power lasers this is demonstrably not precisely conclusive, since general influences of the biostimulation effect (if such exists) are also presumed.

I have now been working for more than a decade with power lasers (Nd:YAG, CO₂, dye, argon) at my laser department in Nürnberg and from the outset I was sceptical towards laser biostimulation. Even so I made a practice of responding only with impartiality to the estimable efforts of colleagues working with low-power lasers, who endeavoured with objectivity and scientific dedication to explain the action of these lasers.

Progress in basic research into the biostimulation effect has advanced far in vitro, but also on animals, mainly rodents. The problems consist in applying the results of this research to sick humans and assessing the possible results. These difficulties are no justification for the colleagues mentioned in your article (who are not known as low-power laser specialists) to magnify suspicions into emotions and to search for humbug in the darkness of the unknown and uncertain. Not even the Laser Center in Berlin, the institution I know and respect and the colleagues who work there, can as yet give any sure answer to the effectiveness or ineffectiveness of biostimulation. To that extent, this question cannot be clarified by a 'simple call' as suggested in your article. The Berlin Laser Center is also actively involved in organizing the world congresses on low-power laser therapy taking place in 1990 at Tokyo and Okinawa. The assertions (attributed to Professor Landthaler) that the increased vascularization following low-power laser irradiation observed and reported by Landthaler and Haina also does not have any clinical relevance are unusual. We must ask what criteria are summoned when an animal experiment of this kind is classed as not clinically relevant and why such animal experiments are instituted if no foundation exists for clinical relevance.

In 1987/88 I also conducted a double-blind randomized study on 40 patients in order to clarify whether the subjective assessment of patients who had been treated with low-power laser (490 sessions) was utilizable for scientific analysis. I also obtained chaotic results in the placebo-laser and actual-laser groups and vice versa (a general biostimulative effect extending to the whole body?). The results were presented in Arlington, U.S.A. And yet: That does not entitle me to wantonly state that biostimulation is humbug.

Not least of all, West Germany has never been the place where biostimulation was practiced intensively. Let us recall that this laser method is applied very extensively in the Soviet Union and in Japan (and elsewhere in Asia). The names of Atsumi and Ohshiro (Japan) in a country where laser medicine is practiced much more intensively or the name of Mester in Hungary communicate to us other signals than characterizing biostimulation as humbug. Moreover, as long as all major national and international congresses, including the U.S.A., Britain, France, Japan, etc., have a department of biostimulation where it is discussed at every meeting, we cannot simply brush aside the subject of biostimulation. It is better to keep researching on and on.

Let us retain our objectivity and keep our eyes open. The oldest principle of the effect of light on tissue is the absorption, transmission and generation of photochemical processes. To these effects we owe the existence of life on earth. With that, the therapeutic effect of the laser light beam must not necessarily belong to the realm of science fiction.