

Laser acupuncture as an adjuvant therapy for a neonate with neonatal abstinence syndrome (NAS) due to maternal substitution therapy: additional value of acupuncture

Neonatal abstinence syndrome (NAS) is experienced by newborn infants who have been exposed to opioids *in utero*.¹ It is the subject of intensive study and, in 2013 alone, just over 70 new papers on the topic appeared in PubMed. Clinical assessment is carried out using a special scoring system which has become internationally established,¹ and the Finnegan score or other modified scores frequently used are diagnostically conclusive.¹ Treatment of NAS usually follows a multimodal regime based on drug therapy with an oral morphine solution, mostly in combination with a sedative, but this has repeatedly become a point of controversial scientific discussion.¹ There has been little research on non-pharmacological therapies for newborn infants with NAS. It has been shown that tight swaddling and non-nutritive sucking may be effective in decreasing the stress in the infant, resulting in fewer erratic, hypertonic and uncoordinated movements.²

Acupuncture in newborn infants is regarded as safe as long as it is applied under standardised conditions by well-trained acupuncturists.³ Within the area of non-insertion acupuncture of neonates with NAS,⁴ we think your readers will be interested in this first case report of the effect of laser acupuncture therapy in combination with a basic pharmacological treatment in a neonate with NAS.

MOTHER AND BABY

This baby girl was born vaginally as the first child of the family at 39

+3 weeks of gestation. The APGAR scores were 9, 10 and 10, respectively. The mother had smoked cigarettes (>10/day) and used heroin long before the pregnancy. For the last 5 years she had been treated with 360 mg/day slow release morphine sulphate (morphine pentahydrate; Substitol, Mundipharma). In addition, she was hepatitis C positive. The newborn infant's body weight was 3258 g (~50th percentile), length was 50 cm (~50th percentile) and head circumference was 33 cm (~10th percentile).

On the second day the newborn infant developed symptoms of NAS, including abdominal distention and irritability, myoclonic jerks and tremors. The Finnegan score¹ was calculated as 16, which is considered abnormal, and medical treatment was started according to our standardised treatment protocol with a morphine solution and a sedative. The sedative was finished on the 10th day and the morphine treatment was finished on the 24th day after tapering the doses according to the Finnegan score. The newborn infant was discharged to the mother on the 38th postnatal day.

ACUPUNCTURE TREATMENT

Laser acupuncture was carried out using a IIIb laser with a wavelength of 675 nm and a power of 10 mW (LABpen MED 10; Behounek, Graz, Austria). Laser acupuncture was applied daily in a calm state approximately 1 h after administration of the morphine solution.

The following ear acupuncture points according to the National Acupuncture Detoxification Association (NADA) protocol were used⁵: Sympathetic point (51); *Shenmen* (55); Kidney (95); Liver (97); Lung (101). The neonate additionally received body acupuncture at *Tai Chong* (LR3), *He Gu* (LI4), *Tai Xi* (KI3) and *Shenmen* (HT7).

The treatment time per ear point was 30 s and on the body the treatment time per acupuncture point was 60 s (figure 1).

SAFETY PRECAUTIONS DURING LASER ACUPUNCTURE

The acupuncturist wore specific protective glasses to avoid retinal damage and the eyes of the newborn infant were covered using an eye protector (Natus Biliband Eye Protector; Natus Med, San Carlos, USA), as previously described.⁶

The physician carrying out the acupuncture is a specialist in neonatology and intensive care medicine; he also has a diploma in acupuncture and a diploma in NADA acupuncture.

COMMENT

We believe this is the first case report of a neonate with NAS due to maternal substitution therapy on whom laser acupuncture therapy was carried out as an adjunct to drug therapy according to a standardised protocol.

The treatment setting in accordance with the NADA protocol uses ear acupuncture exclusively.⁵ In our protocol we combined auricular and body acupuncture to reduce withdrawal symptoms. Auricular acupuncture appears to modify the autonomic dysfunction by increasing parasympathetic activity,⁷ and a meta-analysis of acupuncture treatment for opiate addiction in adults reported that acupuncture combined with an opioid agonist significantly alleviated side effects.⁸

The development of laser acupuncture⁹ has opened a new door in the treatment of children offering a non-invasive therapeutic approach which, additionally, rules out any risks of infection.³ Furthermore, *in vitro* experiments have shown that irradiation with red laser light stimulates ATP release¹⁰ and increases mitochondrial calcium transport⁹ in human mast cells, similar to needle acupuncture. Based on recently published scientific studies dealing with peripheral and central changes,^{6 11} laser acupuncture in neonates appears to be safe.

In summary, the baby was reported to have improved feeding



Figure 1 Application of laser acupuncture at LR3.

following laser acupuncture resulting in a higher caloric intake. Finnegan scores showed a decrease on the day after laser acupuncture treatment. Furthermore, our records show that the newborn infant fell asleep, and the nurses' report described a more relaxed baby after the laser acupuncture. Similar results are reported in newborn infants with colic who had shorter periods of crying due to better relaxation after receiving acupuncture at LI4.^{3 12}

The child did not develop any clinically visible changes on the skin surface as a result of the laser acupuncture and there was no mention of patient distress or discomfort during laser acupuncture.

While no causal links can be determined from the result of this case report, it seems likely that laser acupuncture contributed to the resolution of the NAS symptoms. After the positive findings of this case and in order to increase the number of cases and thus obtain statistically more powerful results, this treatment protocol was registered in the German Clinical Trials Register to start a randomised clinical study (<http://www.drks.de/DRKS00004302>; and <http://apps.who.int/trialsearch/Trial.aspx?TrialID=DRKS00004302>).

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Contributors WR, BU: Conception and design of case report study.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; internally peer reviewed.

To cite Raith W, Urlesberger B. *Acupunct Med* Published Online First: [please include Day Month Year] doi:10.1136/acupmed-2014-010638

Received 23 July 2014

Accepted 29 September 2014

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Acupunct Med published online October 10, 2014

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