

# Active Ear Acupuncture Points in Neonates: Initial Results in a New Research Field

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## ABSTRACT

**Background:** Little is known about active ear acupuncture points (EAP) in neonates. Previous unblinded studies by Stähler van Amerongen et al. showed that neonates have detectable active EAP, and that sick neonates could have more EAP relative to healthy neonates. EAP was investigated in an unblinded trial involving neonates with neonatal abstinence syndrome (NAS). Furthermore, a blinded, controlled observational trial was conducted to compare active EAP present in healthy neonates with EAP of sick neonates.

**Materials and Methods:** An electrical point search device (PS3, Silberbauer, Vienna, Austria) was used to detect EAP. Active EAP were detected with an integrated optical and acoustical signal, and readings were transferred to a standardized ear map. A Mann–Whitney-*U* test and Spearman’s correlation were used for statistical analysis.

**Results:** A total of 94 neonates were enrolled across both trials. EAP were detectable in all healthy and sick neonates. In the blinded trial, sick neonates had a significantly higher number of active EAP than did healthy neonates.

**Conclusions:** A notable difference in the number of active EAP was detected between healthy and sick neonates. More trials with larger sample sizes are needed to confirm the diagnostic power of EAP in neonates.

**Keywords:** neonates, active ear acupuncture points, term, preterm, neonatal abstinence syndrome

## INTRODUCTION

**A**URICULOTHERAPY IS WELL-CHARACTERIZED in adults. In healthy adults, there are no irritated ear reflex zones and therefore no so-called “active” ear acupuncture points (EAP) are detectable. However, in sick adults, active EAP are detectable and can be used diagnostically and therapeutically.<sup>1,2</sup>

Studies concerning EAP in neonates first appeared in 2003, when Kristen Stähler van Amerongen, MD, a Swiss gynecologist, and colleagues, demonstrated the presence of active EAP in twins and their mothers.<sup>3</sup> In 2007, a study describing an investigation of triplets—1 healthy girl and 2 boys with feto-fetal transfusion syndrome—showed that the healthy

girl had the fewest EAP and between the 2 boys, the donor, and thus the sicker of the two, had the most active EAP.<sup>4</sup> Furthermore, in an unblinded study conducted in 2008, Stähler van Amerongen et al. demonstrated that more than 66% of the investigated healthy neonates had no detectable EAP, providing the hypothesis that there is a correlation between health state and the number of identified EAP.<sup>5</sup>

The aim in the current was to identify and locate active (somatic and/or functional) EAP in neonates. This article summarizes the current authors’ recent research results in 2 trials concerning EAP in healthy and sick neonates.

Trial 1 was an unblinded study involving neonates with neonatal abstinence syndrome (NAS) and was conducted as a part of the study: “Laser Acupuncture for Neonatal

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*Trial 1 was an unblinded observational study (registry #: DRKS00004302) and Trial 2 was a blinded, controlled observational study (registry #: DRKS00004857).*

Abstinence Syndrome: A Randomized Controlled Trial.”<sup>6,7</sup> Trial 2 was conducted as a blinded, controlled observational trial to compare EAP between healthy and sick neonates.

## MATERIALS AND METHODS

### Design

The trials were conducted at the Division of Neonatology, Department of Paediatrics and Adolescent Medicine, of the Medical University of Graz, a tertiary neonatal intensive care unit (NICU) in Graz, Austria. The study protocol was approved by the Ethical Committee Medical University of Graz. Trial 1 was an unblinded observational study (registry number: DRKS00004302) and Trial 2 was a blinded, controlled observational study (registry number: DRKS00004857).

### Participant Enrollment

In Trial 1, all neonates born to mothers undergoing opioid substitution treatment, and with the potential to develop NAS and admitted to the NICU were eligible.

In Trial 2, healthy and formerly sick neonates born beyond the 34th gestational week were enrolled. All formerly sick neonates were in stable condition and free of obvious medical treatment for the investigation.

The parents of the neonates in both studies were informed comprehensively about the trial and each gave informed consent before study enrollment.

### Examination

The examination of each infant was carried out, using an electrical point search device (PS 3<sup>©</sup> Silberbauer, Vienna, Austria) in both studies. With this device, an integrated optical and acoustical signal detected the ear points, which were then assigned to a standardized ear map for each participant.

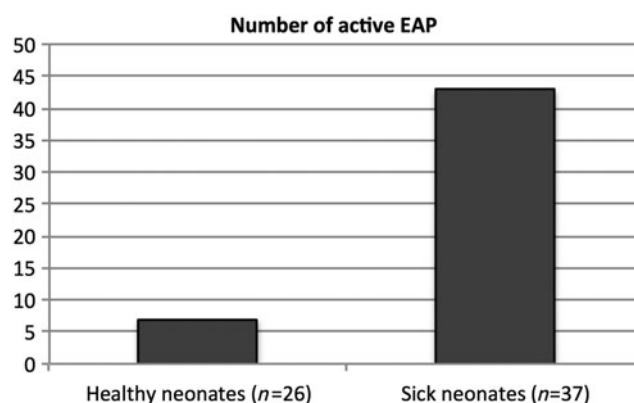
In Trial 1, neonates with NAS underwent an unblinded examination during their hospital stays. In Trial 2, the neonates were taken to a separate room by a study assistant. To guarantee blinding, the investigator was blinded to all information on the participants that had been gathered during EAP identification.

### Statistical Analysis

Statistical analysis was performed, using SPSS (Statistical Package for the Social Sciences; IBM, SPSS Statistics, Chicago, IL). Data were analyzed using a Mann–Whitney-*U* test and Spearman’s correlation.

## RESULTS

A total of 94 neonates were included across both studies, with 31 in Trial 1 and 63 (45 term and 18 late-preterm) in



**FIG. 1.** Number of active ear acupuncture points (EAP) in healthy and sick neonates in Trial 2.

Trial 2. Of the 63 neonates in Trial 2, 26 were healthy and 37 were sick. In Trial 1, active EAP were found in all neonates with NAS (which equated to sick neonates). In particular, psychic and somatic EAP were detectable.

In Trial 2, formerly sick neonates had a significantly higher number of EAP than healthy neonates ( $P=0.000$ ) and this difference was independent of gestational age (Fig. 1). Baseline characteristics are shown in Table 1.

The psychovegetative rim was the most common active somatic area in all neonates in both Trial 1 and Trial 2, and several somatic EAP were the second most frequent. In Trial 1, the most frequently active psychic EAP were the frustration point and the R point.

## DISCUSSION

Neonates were long thought not to have developed EAP. In the blinded Trial 2 of this study, the current authors demonstrated that there are more active EAP in formerly sick neonates than in healthy neonates. Preliminary trials in neonates also showed that active EAP are detectable in sick neonates. Thus, there could also be a correlation between diseases of the inner organs and the corresponding EAP in

TABLE 1. BASELINE CHARACTERISTICS OF STUDY PARTICIPANTS IN TRIAL 2

Characteristics	All (N=63)	Sick (n=37)	Healthy (n=26)
Weeks' gestation (mean)	38 + 4	37 + 6	39 + 2
Birth weight (in g) (mean ± SD)	3055.6 ± 689.7	2840.8 ± 733.8	3270.5 ± 645.6
Male/female	33/30	19/18	14/12

SD, standard deviation.

neonates, based on evidence gathered for adults, wherein the affected organ systems in sick adults are detectable as active EAP and can, therefore, be used for diagnostic and therapeutic applications in auriculotherapy.<sup>1,2,8</sup>

In a study by Stähler van Amerongen et al., the most common active somatic area was the psychovegetative rim, although no psychic EAP were detectable.<sup>5</sup> Some previous unblinded case-series in 2010 involving neonates with NAS also demonstrated detectable active EAP, highlighting, for the first time, that active psychic EAP could be found.<sup>9,10</sup> In the 2 current trials, the psychovegetative rim was the most common active somatic area in all neonates and active psychic EAP were also demonstrated.

The psychovegetative rim is an area lateral to the scaphoid fossa below the helical flange. The term “vegetative rim,” mainly used by German-speaking authors, was introduced in 1971 by Günter Lange, MD, who supposed that the line of points located on the scaphoid groove, very close to the internal border of the helix, was essential for regulating the functions of a disturbed segment of the body according to Paul Nogier, MD’s principle of alignment.<sup>11</sup> This alignment principle provided the hypothesis that this part of the auricle could represent the intermediolateral nuclei of the lateral horn, the cells of which give rise to preganglionic sympathetic outflow.<sup>12–14</sup> However, Paul Nogier never referred to this line of points as the “vegetative” rim or groove. Moreover, Chinese authors never included this term in their standardized auricular map produced between 1993 and 2008.<sup>15</sup>

In the unblinded Trial 1 involving neonates with NAS, active somatic and psychic EAP were identified. Withdrawal itself can be interpreted as a disorder composed of somatic and psychic symptoms. Furthermore, the current authors speculate that the activity of psychic EAP may be specific for neonates with NAS. The detailed results of this study were previously published.<sup>7</sup>

## Limitations

One limitation of the current study is that all enrolled neonates were examined only once and not repetitively. Furthermore, no data are available for repeat examinations, and data that describe interobserver differences using the same electrical point search device were also not collected. Another limitation is the so-called acupuncture-point detector itself.<sup>16</sup> These limitations should be considered when interpreting these results.

## CONCLUSIONS

A notable difference in the number of active EAP was detected between healthy and sick neonates, wherein sick neonates had significantly more EAP than did healthy neonates. Based on these and other preliminary studies, more data should be acquired to generate evidence for EAP in

neonates to create diagnostic and therapeutic approaches that involve EAP.

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## AUTHOR DISCLOSURE STATEMENT

No competing financial interests exist.

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