

# A RETROSPECTIVE STUDY OF CHIROPRACTIC TREATMENT OF 276 DANISH INFANTS WITH INFANTILE COLIC

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## ABSTRACT

**Objectives:** The aim of this study was to investigate if the outcome of excessively crying infants treated with chiropractic manipulation (1) was associated with age and/or (2), at least partially, can be explained by age according to the natural decline in crying.

**Methods:** This was a retrospective evaluation of clinical records of 749 infants from a private Danish chiropractic practice. All of the infants were healthy, thriving infants born to term within the age of 0 to 3 months who fulfilled the diagnostic criteria for excessively crying infants (infantile colic), whose parents sought chiropractic treatment. The infants were treated using chiropractic management as decided by the treating doctor of chiropractic, and changes in crying based upon the parents' report were noted as improved, uncertain, or nonrecovered. Age predictor groups were cross-tabulated against the outcome variables, and difference between classification groups was tested with  $\chi^2$  tables and confidence intervals.

**Results:** Slightly older age was found to be linked to excessively crying infants who experienced clinical improvement. However, no apparent link between the clinical effect of chiropractic treatment and a natural decline in crying was found for this group of infants.

**Conclusion:** The findings of this study do not support the assumption that effect of chiropractic treatment of infantile colic is a reflection of the normal cessation of this disorder. (*J Manipulative Physiol Ther* 2010;33:536-541)

**Key Indexing Terms:** *Chiropractic; Infant; Crying; Treatment Outcome; Colic; Retrospective Studies*

Most excessive crying behavior typically begins at the age of 2 weeks and resolves by 3 months of age. However, current knowledge suggests that excessive crying that persists beyond 3 months may be a substantial problem.<sup>1,2</sup> It may be that crying remits, but adaptive behaviors persist, with evidence of long-term negative sequelae related to the incidence of infantile colic. Such sequelae may include dysfunctional parental interaction as the infants become less competent in interacting with its parents, resulting in a negative parent-child relationship.<sup>3,4</sup> Also, the serious nature of this condition sometimes may provoke parents to fatal abuse (ie, smothering, slapping, or shaking) to stop their infant's crying.<sup>5</sup> Barr et al<sup>6</sup> indirectly tested the hypothesis that crying is a trigger for shaken baby syndrome.

Unexplained and uncontrollable crying in healthy, thriving babies from 0 to 3 months of age, more than 3

hours a day and more than 3 days a week for 3 weeks or more, usually in the afternoon and evening hours (Wessel's criterion from 1954)<sup>7</sup> is still the most accepted definition of an excessively crying infant. The definition is often used regardless of the duration in weeks, given that parents of crying infants often seek help before the criterion of 3 weeks duration is fulfilled.<sup>8</sup>

Based on Wessel's criterion, the occurrence of excessively crying infants varies from 10% to 40% in Western studies and from 10% to 20% in Denmark.<sup>9</sup> This difference may be explained by different modifications of Wessel's criterion and different measurements of crying and fussing in retrospective and prospective studies.<sup>9</sup>

Despite several investigations, the etiology of excessively crying infants remains unknown. It has been suggested that it has a multifactorial etiology.<sup>9</sup> However, the pattern of the normal crying curve (Fig 1), which has been described as typical of normal developing infants with regard to early neurophysiologic function and the response to physiologic needs, that is, hunger and discomfort,<sup>10</sup> could be another explanation of excessively crying infants. Therefore, according to the normal crying curve, infants from the age of 6 weeks and older (when the curve declines) can be expected to recover from their condition with or without chiropractic treatment. The hypothesis that the early-peak crying pattern is maturational and related to

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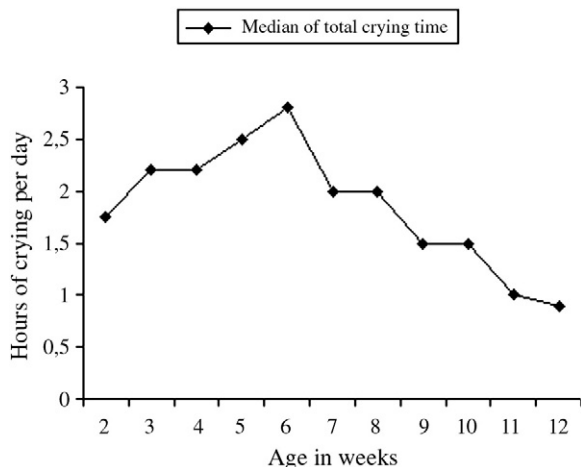
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**Fig 1.** Summary of the total crying time of the 80 infants studied. (Reproduced with permission from Brazelton T. *Crying in infancy.* *Pediatrics* 29:579-88, copyright © 1962 by AAP.)

normal human infancy is supported by Barr et al,<sup>11</sup> who found a similar crying pattern in preterm infants relating the peak of crying to gestational rather than chronological age.

Some chiropractic physicians in private practice offer chiropractic treatment for these excessively crying infants because in their clinical experience they have seen improvements in infant crying. Two randomized controlled clinical trials (RCTs) with different results have been published on chiropractic treatment for excessively crying infants. In a Danish study<sup>12</sup> where the parents knew which treatment was given to their infant, chiropractic had the best outcome compared to placebo. However, in a subsequent Norwegian study<sup>13</sup> where the parents were blinded, there was no difference between placebo and chiropractic treatment. This obviously evokes the suspicion that the treatment effect in the Danish study can be explained by respondent bias and/or placebo.

Other possible explanations include a dose response phenomenon in the Norwegian study, which used a consensus treatment protocol of 3 treatments instead of the treating doctor of chiropractic's clinical judgement.<sup>14</sup> In the Norwegian study, the treatment used was a modified fingertip mobilization rather than manipulation.<sup>15</sup> After treatment in the Norwegian study, average crying was 3.1 h/d, still fulfilling the duration criterion of excessively crying infants (minimum 3 h/d). In the Danish study, average crying was 3.9 h/d before and 1.2 h/d after treatment. According to the Danish study, chiropractic treatment may have an effect, but weaknesses in study design mean that it is uncertain if there is a respondent bias and/or placebo effect. Neither of the 2 RCTs on excessively crying infants has considered the normal crying curve as an explaining or confounding factor.

It would therefore be relevant to investigate if improvement from the condition after chiropractic treatment can, at

least partially, be explained by a natural change in crying pattern. This could be done by comparing the outcome of the younger with the older excessively crying infants who received chiropractic treatment. Our hypothesis was that older infants have a better prognosis because they are closer to the natural "end point" for their condition. Therefore, we also compared age and outcome of excessively crying infants younger and older than 6 weeks, respectively, with the course of the normal crying curve that shows that the duration of crying increases from 2 to 6 weeks and thereafter declines until the age of 12 weeks.

The aim of this study was to investigate if the outcome of excessively crying infants treated with chiropractic manipulation was associated with age, and/or, at least partially, can be explained by age according to the natural decline in crying.

## METHOD

### Design, Setting, Intervention, and Study Subjects

The study was designed as a retrospective inspection of standardized infant examination records from the past 11 years (1997-2007). All infant records were from one Danish chiropractic practice with a special interest in the treatment for excessively crying infants. To compare the outcomes with the natural crying cessation, only crying infants within 0 to 3 months of age at the time of the first visit, who were born to term (>3 weeks before due date was considered premature birth) and fulfilled the definition of excessively crying infants, were included in the study. Chiropractic management, as decided by the treating doctor of chiropractic, had already been performed. It normally consisted of 2 to 5 visits for a period rarely exceeding 8 to 10 days. Besides chiropractic manipulation, the parents were given advice about carrying and handling their infant to avoid undue stress on the infant's spine.

The definition of excessively crying infant was that

- parents consult the doctor of chiropractic complaining that their infant had a minimum of 3 hours of violent spells of crying per day;
- during spells of crying the infant shows "typical" excessively crying behavior (ie, motor unrest; often flexing knees against the abdomen; or extending the trunk, neck, and extremities);
- during attacks, the infant cannot (or only temporarily) be comforted by being picked up, walked, or cradled; having a change of diaper; or being offered a pacifier;
- apart from the attacks of excessively crying behavior, the infant shows normal behavior and development without symptoms that could be a sign of any other disease; and
- the infant does not have any known past or present disease or injury.

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