

The use of chiropractic care among 6-week-old babies in Bergen, Norway: a cross-sectional survey

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ABSTRACT

Objectives: This study investigates the prevalence of six week-old babies in Bergen, Norway who present to a chiropractor, describes their demographics and documents their presenting complaints and referral patterns. **Methods:** This was an observational cross-sectional survey. Questionnaires were distributed by the health care visitor/midwife to the parents/guardians of infants attending the six-week control (health check up) in nine health care centres in Bergen, Norway. After collection, each form was coded with a number and data entered into the Statistical Package for the Social Sciences (SPSS). **Results:** In all, 123 surveys were collected. Among these, 12 (10%) had seen a chiropractor. Assisted deliveries were more frequent among the infants who had presented to a chiropractor versus the general population. The most common presenting complaints were colic and fussy baby (each reported by 6 participants). The most common mode of referral was by friends/family (N=5). **Conclusion:** The prevalence of six week-old babies in Bergen who have seen a chiropractor was 10%. This is the first study to have investigated the prevalence of all six week-old babies in the general population presented to a chiropractor at a snapshot in time. However, due to the small sample size, these results must be viewed with caution, and further, larger studies are warranted.

Keywords: prevalence, pediatrics, chiropractic

Introduction

The majority of published research within chiropractic care refers to the adult patient population. To date, there is little published research that describes and defines chiropractic pediatric patients and their most common conditions. However, as many as 90.4% of chiropractors around the world report treating pediatric patients,¹ and this leaves an open gap for a scientific platform upon which to base the management of such patients.

What is clear about chiropractic pediatric practice is that infants are the most highly represented age group. Allen-Unhammer et al² investigated the use of chiropractic care by pediatric patients in Norway (N=137). Similar to other studies,^{3,4} they found that the majority (39%) of the pediatric patients (under 18 years of age) were 0-3 months old. In the most comprehensive study by Hestbaek et al,³ 40% of all patients (0-18 years old) were less than 1 year of age (N=318), and among these, 74% were less than 4 months old, with a slight over-representation of male babies (54%) (N=725). The most common presenting complaint in infants was excessive crying/infantile colic.^{1,2,4}

Referral practices to chiropractors have been found to vary

depending on age of the patient. The overall use of CAM is often strongly influenced by the experience of the family physician and friends. There are indications that parents who themselves have had chiropractic care are more likely to take their children to the chiropractor.⁵ The proportion of children whose parents were also chiropractic patients has been found lowest among babies: 62% versus 80-84% for other age groups. This corresponds well with the higher referral rates from other health care providers for the youngest age group.^{3,4} Twenty-six percent of children were referred by people other than family and friends. Among these, health visitors referred most of the babies (20%) and GPs referred the majority of the teenagers.³ Similarly, Allen-Unhammer et al² found that 33% of pediatric patients were referred by people other than family and friends, including GPs and health visitors. In the study by Doyle,¹ only 7% of pediatric patients were referred by other health care providers, including chiropractors and medical practitioners.

Mapping of chiropractic pediatric patients and their characteristics can help identify areas where there is a particular need for research, increased public awareness and interdisciplinary understanding. This research was designed to find out how many of infants in Norway were presented to

chiropractors for care, along with their demographic profile, presenting complaints and referral patterns.

Study Design and Methods

The study was an observational cross-sectional survey. A paper-based questionnaire containing primarily closed questions was used for the data collection. No validated, standardized questionnaire was found during the literature search, which could give answers to the research questions in this study. Consequently, a questionnaire was constructed. The questions chosen were based on the aims and objectives of this research project, previous studies covering similar topics, in addition to inclusion of some questions from the general Paediatric Intake Survey used at the Anglo European College of Chiropractic.⁶ The latter was chosen because it was suitable for the age group that formed the basis of this study.

The questionnaire was handed to the population of mothers and/or guardians of babies attending the 6-week control at health care centers in Bergen, Norway. The 6-week control is part of the recommended health plan for infants advocated by Norwegian authorities. It is not mandatory and it is free of charge. Traditionally, it is widely used and attended. Approximately 5,000 babies are born every year in the hospital in Bergen.⁷ However, this is a regional hospital so this estimate covers counties surrounding Bergen as well. The inclusion criterion in this study was all attendees at the 6-week control, who could read Norwegian or English.

Prior to commencing distribution of the questionnaires, a pilot study was conducted involving the mothers/guardians of eight, six-week-old babies attending the clinic. Seven of the participants were Norwegian speaking and one mother was English speaking. The feedback required a rephrase to be made in question number four in the Norwegian questionnaire. None of the results from the pilot study were included in the main study.

Initially, a telephone call was made to the person in charge of each health care center, and a description of the study was presented. The Health Department in Bergen had already informed the person in charge for each health care station about this study. Only one region refused to participate due to work overload as a result of people on sick leave, thus nine out of 10 health care centers participated. Those who agreed to participate received an e-mail presenting the study with the questionnaires attached, and an appointment for initiation of the survey was made.

The author visited the participating health care centers and delivered the questionnaires by hand. A total of 350 questionnaires, of which 300 were in Norwegian and 50 were

in English, were delivered among the nine participating health care centers. The denominator was estimated from the number of births in the relevant health care centres in 2015.⁷ The midwife or nurse in charge of each health care center instructed his or her colleagues performing the 6-week control of their preferred procedure to conduct the survey. It had been emphasized that the author's preference was that the participants were to be asked to complete the questionnaire before commencing, or during the 6-week control. However, each health care center carried out its own procedure when implementing the survey, according to what was practically feasible.

Completed questionnaires were placed in a closed box in the office or at reception. Initially, the author collected the questionnaires on a weekly basis to obtain an indication of the response rate, and to make sure there were no misunderstandings or questions unanswered. Once collected, each questionnaire was given a number in order to easier control the data analysis procedure. All questionnaires were eligible for inclusion, and there were no reports of individuals refusing to participate. The Statistical Package for the Social Sciences (SPSS) program was used to analyze the data. The data was mainly categorical and the variables were analyzed using descriptive statistics. The data collection period lasted from February 29, 2016 to May 06, 2016.

An independent ethics approval committee approved the study. Additionally, the Health Department in the county of Bergen had given permission to involve their employees in the data collection process. There was no direct contact between respondents and researchers, and questionnaires were answered anonymously.

Results

In all, there were 123 parents who completed the survey for their infant. Three hundred and fifty surveys were distributed, giving a response rate of 35%. There were no reports of participation refusals. Of the participants, 46% (N=57) were male and 54% (N=66) were female. The mean birth weight of the babies was 3,516 grams. The mean duration of pregnancy was 39.5 weeks, (10 participants had left this question blank). Previously completed pregnancies showed a mean of 0.86 (three participants did not answer this question). The majority (94%) (N=115) presented head first, whereas 3% (N=4) displayed breech position, 2% (N=3) had face presentation whereas 1% (N=1) presented with hand or foot first.

Normal vaginal delivery was the most common type of birth (N=83), followed by induced birth (N=23) and then ventouse (vacuum extraction) delivery (N=11). Ten participants reported very rapid birth, and five had forceps delivery. Emergency caesarean was noted in five participants,

whereas four reported planned caesarean. Participants could “tick appropriate boxes” in this section, thus the total number (N=141) exceeds that of the number of participating subjects (N=123). One subject left this section open.

Among the total of 123 subjects, 12 (10%) had seen a chiropractor, of whom five were boys and seven were girls. Mean birth weight of subjects who had seen a chiropractor was 3,488 grams. The mean duration of pregnancy was 38.7 weeks. One infant was first-born, and the mean from previous pregnancies was 1.0. One participant left the two latter parameters unanswered, thus those numbers are based upon 11 subjects. Demographic data of the infants who had seen a chiropractor is summarized in Table 1. All subjects’ position at birth was with head first, except one planned caesarean. The latter left this question blank. Normal vaginal delivery was the most common birth presentation (N=7), followed by induced birth (N=3). One participant reported ventouse delivery and one reported a planned caesarian.

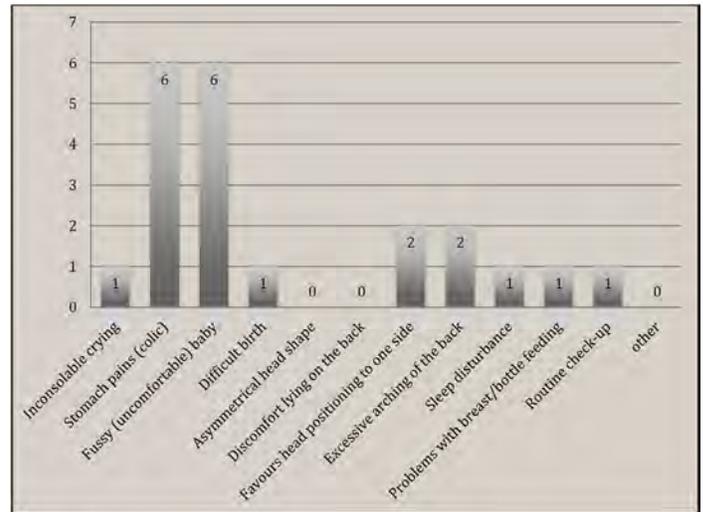
Table 1. Demographic data of the infants presented at six-week control in Health care centres in Bergen, Norway who had seen a chiropractor

| Demographic data | Number of responses (N) | Left blank (N) | Mean | Standard deviation |
|----------------------------------|-------------------------|----------------|------------|--------------------|
| Birth weight | 12 | - | 3488 grams | 814 grams |
| Duration of pregnancy | 11 | 1 | 38.7 weeks | 2.1 weeks |
| Previously completed pregnancies | 11 | 1 | 1.0 | 0.8 |
| Assisted birth | 5 | | n/a | n/a |
| Non-assisted birth | 7 | | n/a | n/a |

In the presenting complaints section, subjects could tick as many boxes as wanted. The most common presenting complaints were colic and fussy (uncomfortable) baby, reported by six. Among these, three chose both the colic and fussy baby categories. The second most common presenting complaints were favored head positioning to one side and excessive arching of the back, both reported by two respondents. Inconsolable crying, sleep disturbance and feeding problems were all reported once. Similarly, difficult birth and routine check-up were both ticked once each. No subjects were reported to have asymmetry of the head, discomfort lying on the back or other complaints. The presenting complaints are summarised in Figure 1.

The most common mode of referral was by friends and/or family (N=5), followed by health care visitor and themselves (N=3). Two participants reported referrals from another chiropractor, similar to other recommendations (N=2). One subject was referred by a pediatrician, and one by a midwife. Participants could tick appropriate boxes.

Figure 1. Presenting complaints of infants presented at six-week control in health care centers in Bergen, Norway (N=12) who had seen a chiropractor



Discussion

This survey aimed to determine how many six-week-old babies had presented to a chiropractor in Bergen, Norway, to describe their demographics, to identify their presenting complaints and to outline who referred them to the chiropractor. Because of the small sample, any trends observed may not be representative of the general population. No other study has addressed the prevalence of all six-week-old babies in the general population who have seen a chiropractor at a snapshot in time.

Assisted deliveries were more common among the chiropractic subjects in this study versus the general population. This has been the case in several other studies of chiropractic infant patients.⁸ Infants with induced birth or intervention birth have a higher proportion of minor birth trauma,⁹⁻¹⁴ with the potential consequence of musculoskeletal problems.¹⁵ Furthermore, Zwart and colleagues¹⁶ found that the highest association of infant colic was related to birth trauma. The influence of intra-uterine pressures and/or excessive compressive and tractional forces at birth has potential to have long-term effects on the infant, although this has not yet been established. According to Stellwagen et al¹⁷ pelvic obliquity, rib cage moulding, hip dysplasia, torticollis, postural scoliosis and asymmetry, and plagiocephaly are regularly encountered in the new-born. The long-term effect of leaving these conditions untreated is unknown, although it is known that young children have headaches and pain in far larger numbers than previously thought.¹⁵ Considering the high possibility of infants developing musculoskeletal problems, or developmental delay syndromes, as a result from assisted births or interventional births, is there sufficient attention being paid towards taking preventive

measures, or at minimum, examination for musculoskeletal dysfunctions at birth?

In the present study sample, most of presenting complaints were related to colic and fussy baby, and the respondents had ticked several boxes relating to excessive crying/colic/discomfort. This finding corroborates many other studies.¹⁻⁴ Interestingly, specialist neurologists, orthopedic surgeons and physiotherapists have implicated the musculoskeletal system as a cause of excessive infant crying.¹⁸⁻²¹ Are we heading towards an inter-professional understanding of the importance of the musculoskeletal system in the fussy infants? Inconsolable infants may have huge socioeconomic impacts. Extreme infant crying has, in fact, been associated with organic and psychosocial risks, including high rates of prenatal stress and anxiety, maternal psychopathology, child abuse and partnership conflicts.¹⁸

Infants in the current study were most commonly referred to a chiropractor by friends and/or family. This is consistent with findings from the study by Doyle.¹ One-fourth were referred by a health care visitor, which corresponds to the findings from Hestbaek et al.³ Another fourth made the decision themselves that they should take their infant to a chiropractor. The fact that no subjects were referred by a GP or physiotherapist, reflects the authors own clinical experience. Firstly, a plausible explanation may be that treatment by physiotherapist or manual therapist is free of charge for children under the age of 12 years in Norway. Secondly, GPs by tradition refer to physiotherapy. Nevertheless, it is encouraging that one infant was referred by a pediatrician, which is an important indication of the acceptance of chiropractic competency. In a recent study from Canada,²² referrals from the medical profession were highest to chiropractors with a known musculoskeletal practice. It is thus likely that the number of referrals to chiropractors varies among different regions and different health care stations depending on whether there is an established chiropractic clinic with pediatric competence in the area or not. However, this was beyond the scope of this study.

This study is unique in that it was designed to cover all six-week-old babies in a medium-sized city in Norway at a snapshot in time. This study has severe limitations. The low number of participants means the findings cannot be generalised. Every year, approximately 5,000 babies are born in the Bergen hospital. However, this number includes infants living in surrounding counties as well. Considering that the data collection period lasted for 10 weeks, the estimated number of six-week controls in the participating health care centers was 350, even though this period included the Easter holiday. With only 123 returned questionnaires, the results of this study are based on a response rate of 35%. Minimizing non-response bias was considered as one of the

main challenges during this study. Since the data collection relied on the enthusiasm from the midwives working in the different health care centers, there was no guarantee that the questionnaires were distributed to all potential participants. Additionally, since the author was not present during the process where the sample population was invited to participate, it is likely that the participants felt less encouraged to engage in the survey. These two reasons are the most likely explanations for why there were only 123 respondents. Furthermore, recall bias was likely to influence the answers since many of the respondents are in a situation with little sleep and some degree of post partum exhaustion, and the focus is on the actual six-week control. There is also a possibility that the infant was fussy during the consultation, and that the parents thus would not want to spend excessive time at the center, and thereby declining to answer the questionnaire, or not thinking the answers through. This study aimed at eliminating selection and sampling bias by including all six week-old babies. Since there is no follow-up in this study, there were no dropouts. Bias from misclassification in the questionnaire was hopefully avoided by completion of a pilot study.

Perhaps the number of infants seen by a chiropractor would be higher if the survey had included older babies. However, since symptoms often occur between two to four weeks of age,^{23,24} six-week-olds were considered a convenient age group for this survey. This is supported by the findings of Marillier and colleagues,²⁵ who reported that the average age at the first visit to a chiropractor is five weeks. It is most likely that speciality practices get much younger infants.²⁶

Since there is little published research in the field of manual therapies for pediatric patients combined with an increasing use of pediatric chiropractic care, the profession has an obligation to provide up-to-date evidence for the justification of the management provided. Inherent to this statement is that a profound rationale for, and understanding of, etiologies and diagnoses is established. Mapping and identification of pediatric patients is fundamental to developing diagnostic criteria and treatment protocols. Documenting referral patterns in chiropractic care of the pediatric patient will also add important information regarding other health professions use of chiropractic care and support interdisciplinary engagement. Similarly, it may give indications of which other health professions could benefit from more information about chiropractic pediatric care in general.

All of these parameters of health care for this patient group require significantly more research. There is little published research that describes and defines pediatric patients and their most common musculoskeletal conditions, and treatment strategies basically rely upon clinical experience. In relation to the potential long-term consequences concern-

ing the musculoskeletal system and the behavioral developmental challenges implicated, a musculoskeletal screening program for infants is suggested.

Conclusion

This study found that 10% of six-week-old infants in Bergen, Norway have seen a chiropractor. The most common presenting patients were colic and fussy babies. Assisted

deliveries were more frequent among the infants who had seen a chiropractor versus the general population. The infants were referred by friends and family, health care visitors, and parents making the decision themselves. This study was too small to determine more than trends and more research is required to establish when and for what reasons parents in the general population present their infant to a chiropractor.

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