

# **Chiropractic management of a 5-year-old boy with sleep disturbance and challenging behaviour: an evidence-based case report**

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## **Abstract**

Children with sleep problems are reported to have more behavioural problems. Common interventions to address this include behavioural routines to improve sleep and pharmacological approaches although a search of existing literature revealed a marked lack of evidence. This case report outlines the chiropractic management of sleep difficulties and challenging behaviour in a 5-year-old boy. The clinical presentation, assessment, and chiropractic management of the case is described. The outcome was a marked reduction in sleeping difficulty and a concurrent improvement in behaviour. This case report highlights the need for further study in the area of sleep disorders and associated behavioural issues in young children.

## **Background**

Children with sleep problems are reported to have more behavioural problems (1,2). Severe chronic sleep difficulties are frequently associated with neurodevelopmental disabilities including mental retardation, epilepsy, cerebral palsy, visual impairment, autism, attention deficit/hyperactivity disorder, foetal alcohol spectrum disorders and brain mal development (3). Sleep disturbance also has an impact on physical health such as deleterious effects on the cardiovascular, immune and various metabolic systems, as well as impaired coordination and an increase in accidental injuries. Family members of those with sleep disturbance also suffer with negative effects on daytime function and general well being; factors that may also contribute to increased levels of stress (2-4).

Despite these findings, there is little research for best therapy for sleep disturbance in the paediatric population. A wide array of medications available for children with sleep difficulties. Most of these are hypnotic agents which may cause significant adverse effects. There does not appear to be a clear body of evidence to support the use of hypnotic agents. Their usage seems to be largely based on clinical experience, empirical data derived from adults, and small case studies (3).

One of the motivating factors for parents seeking alternative and complementary medicine for the resolution of their child's sleep disorder is, perhaps, their concern about the off-label and unlicensed use of sleep medications (5).

The first line of treatment for all children with sleep difficulties would be to improve their sleep-related behaviours, although the reasons why these promote sleep are not well understood (3).

With this evidence in mind and with the wish to further contribute to evidence-based chiropractic, management of a 5-year-old boy with sleep disturbance and challenging behaviour is described.

### **Case Presentation**

A 5-year-old boy, Master J, presented to a chiropractic clinic with his mother and twin sister. His mother related that her son had difficulty sleeping and this had always been the case since he was born. Master J had difficulty getting to sleep and then also woke during the night for up to two hours at a time. This was in contrast to his twin sister who had no difficulty sleeping.

His mother described her son as a “troubled soul”. He would “wake up troubled” and seemed to have a lot on his mind. As a baby he would wake up screaming and, now at 5-years-old, he could wake for a couple of hours at a time during the night. When he was younger, he told his mother ‘there were monsters’. Master J had previously taken counsel with a paediatrician and a psychologist, however no treatment was advised. The sleep disturbances were having an effect on the quality of life of Master J and the entire family.

Master J’s mother reported that the family had tried a sleep routine, but it was unsuccessful. The family had also removed any stimulating factors before bedtime, i.e. he was not allowed to have fizzy drinks, eat close to bedtime nor have television close to bedtime. This also had no effect on Master J’s sleeping pattern. A food diary also revealed no link between daytime behaviour and types of food consumed. His twin sister, in contrast, slept well.

Although Master J was considered to be very bright, his teachers and mother felt that he did not concentrate well in class. His social skills were well developed and he was someone who got on well with his peers. In class he was considered “lively and a joker”. His mother stated that she thought he was very lively compared to his sister and peers and that at times he was uncontrollable.

The case history of Master J revealed that his birth was traumatic. He was delivered four weeks early by Caesarean section and was then placed in the Paediatric Intensive Care Unit (PICU). His mother also noted that in the early stages after birth, Master J did not bond well. His twin sister was not placed in PICU, nor were there any notable bonding issues.

During examination, it was noted that Master J was indeed “fully charged”. He did not take instruction well as he seemed distracted and had difficulty focusing his attention.

Neuromaturation/developmental screening was found to be age-appropriate, however during testing of visual and auditory sequencing he had difficulty focusing his attention.

## **Clinical Question**

In a child with sleeping difficulties and challenging behaviour, does chiropractic management improve sleep patterns and behaviour?

## **Literature search strategy**

To determine what evidence was available for manual therapy and sleep disturbance in a 5-year-old boy, the PubMed database was used (6). As little evidence was available, limits on the type of study design were not applied in the search. A number of papers were returned using the MeSH terms (Sleep Disorders [MeSH] AND Musculoskeletal Manipulations [MeSH]) (n = 79) and (Massage [MeSH] AND Sleep Disorders [MeSH]) (n= 51). However, these were not relevant as the interventions were either acupuncture or massage, or in some cases the patient groups were not relevant to the clinical question.

A search in PubMed of the phrase, “treatment of common paediatric sleep disorders” yielded 173 articles. Screening of titles indicated 21 potentially relevant studies, following exclusion of articles if they included children younger than 5, if a medical condition was co-existing (e.g. kidney, heart, cancer), or if they mentioned the specific disorders of sleep obstruction and sleep apnoea. These were examined in detail and their bibliographies checked for further relevant studies, however none were related to chiropractic and sleep disorders. The ICPA website (7) was searched and three articles were found (5,8,9). These reported positive results for chiropractic helping sleep disorders, however the subjects in each were 3-years-old and younger. One of these papers, a case study by Alcantara et al (5), included an evaluation of the literature on sleep disorders and chiropractic. However the author found that there was a lack of literature involving patients less than 18 years of age with sleep disorder complaints. From the bibliography (5), further articles of interest were found (10,11), giving a total of three studies. A Google (12) search using the terms as outlined in the PubMed search did not yield any further studies.

## **Summary of existing literature**

The study by Alcantara et al (5) reports the case of a 3-year-old male with sleep disordered breathing syndrome, managed with chiropractic care.

The only other study relating to chiropractic management of children with sleep difficulties (10) described a study of 59 infants with cows milk intolerance (CMI) and the effect of chiropractic management on the sleep disturbance caused by the CMI. The chiropractic management included the same method of adjusting as used in this case report. Management also included diet and parental counselling, together with the chiropractic treatment, resulting in a reported improvement in sleep disturbance in the children.

A further report by Jamison (11) was a tripartite pilot study to monitor sleep patterns of patients undergoing chiropractic care. While this study was not directly relevant to this case since it only included subjects who were older than 16, it is interesting to note that patients studied had a high

expectation that chiropractic would have an effect on their sleeping pattern. Chiropractors also had a positive expectation but somewhat less than the patient's. Participating chiropractors were encouraged to restrict their study sample to patients have maintenance care, which was defined as "patients who present for regular chiropractic care with or without the presence of symptoms." It was reported that in one third of the 154 patients who completed the semi-structured interview of the retrospective study, sleep patterns were changed immediately after their chiropractic adjustment. All but one of these 52 patients reported improvement. Positive effects demonstrated by chiropractic were transient and short-term. The self reported diaries filled in by the patients were subjective, highlighting a methodological difficulty in studying sleep difficulties. Jamison suggests that to overcome the limitations of this study, studying subjects in a sleep laboratory could be helpful. However, researchers studying the pharmacological management of insomnia in children and adolescents raised concerns with this approach (4). It was felt that children may not tolerate the multiple sensors employed during the studies and the findings may not provide a true reflection of the child's sleep behaviour. They suggested that actigraphy, a wristwatch-like device which monitors activity-based sleep, may be more appropriate. The device can be worn at home and can therefore provide a more natural view of the sleeping patient. The Jamison study (11) concluded that the pilot study failed "to produce convincing objective evidence that chiropractic care improves sleep behaviour." The author thought that the reduction of pain in acute patients may have been a mechanism for promoting better sleep, however this was not the case for the many maintenance cases included in this study.

In summary, the literature identified in relation to the clinical question was extremely limited and included only two studies evaluating the effect of chiropractic management on sleep difficulties in children. One case study reported beneficial effects in a 3-year-old boy (5), while a further study describing improvements was in a somewhat different patient group (infants with cows milk intolerance) (10). Methodological issues that may be encountered when conducting studies of sleep difficulties in children were also suggested (11).

### **Chiropractic examination and treatment**

Postural examination revealed the patient's head and neck laterally flexed to the right, whilst the pelvis, shoulders and lumbar spine were laterally flexed to the left. The patient was examined using NeuroImpulse protocol (NIP), a protocol that takes into consideration the kinesiopathology, neurological component as well as the compensatory pattern (13). Master J was given a gentle chiropractic adjustment involving holding sustained light pressure for 8-10 seconds followed by low-amplitude, high-acceleration thrust which is intended to produce a significant impulse effect on the nervous system (13).

### **Patient outcome**

Master J was seen a week after the first adjustment. At this time his sleep had improved a little. He no longer spoke about monsters, but did say that he was scared. At this visit, a food diary was given

to take home and complete. Master J was reassessed and again treated using the NIP technique. An appointment was made for one week.

At the next visit Master J's mother reported that his sleeping had been brilliant. The food diary did not reveal any consistent factors related to behaviour during the day or night. The patient was seen again two weeks later, reassessed and adjusted as appropriate using NIP. After this session when the patient was interviewed a week later Master J was sleeping through the night and his behaviour was markedly improved. Master J's Mother reported that his teacher now described him as boisterous rather than uncontrollable.

Master J's appointments were then spaced further apart to one-month intervals. Master J continued to sleep through the night and behave better during the day. His mother reported that he was "a different child". Master J's appointments were spaced increasingly further apart in time until the condition was stable and regression was no longer reported.

At one year since the first session of chiropractic, Master J is reported to sleep through the night, does not report any night terrors and his behaviour is now very calm and "normal" for a 7-year-old. His mother reported that it was difficult to tell that he ever had a sleep problem. Master J's concentration has improved although can lapse if not comfortable with the task he has been given. Master J's daytime behaviour was also reported to have improved at home and at school.

When his neurodevelopment was reassessed in the clinic, his concentration was age-appropriate and was able to listen and respond to instructions appropriately.

## **Discussion**

Although little evidence is available for using chiropractic on a 5-year-old with sleep disturbance and challenging behaviour, there is also little evidence for the use of pharmacological intervention. Most of the medications used in children for sleep disorders are prescribed off label with dosages being largely unknown (3, 5). The paediatric population are difficult to prescribe for due to different ages, sizes and weights in any given age group (4).

Whilst the mechanism for an effect of chiropractic management on sleep disorders is not fully understood, it could be hypothesized that because sleep is due to the action of the central nervous system the chiropractic adjustment has an effect on this.

The type of adjustment used on Master J is gentle and well tolerated; the pressure used is similar to that used in checking a ripe tomato. Given this, it might be well to consider this type of treatment in the case of young children with sleep disorders.

Behavioural routines have well been established as helping children to resume good sleep patterns. These are non-invasive and should be used within an integrated sleep management plan. Alongside

this, chiropractic management may be considered to be helpful especially when sleep routines fail. Non-invasive measures might be utilised before pharmacological intervention is considered (4).

## Conclusion

Although case reports are considered low in the hierarchy of evidence, they can provide valuable clinical information about an observation made in private practice. Sharing this information in the form of a case report can be useful to other clinicians who may observe similar clinical dilemmas and challenges in their own practice. Case reports are limited in the strength of evidence they provide and, therefore, suggestions for changes in interventions or prevention cannot be made (14). Case reports can, however, stimulate further research (5) and can have a valid role in evidence-based practice: “Evidence-based medicine (EBM) is the integration of best research evidence with clinical expertise and patient values” (15).

This case report has shown that chiropractic management was apparently helpful in a 5-year-old boy with sleep disturbance and challenging behaviour. This report has highlighted the need for further study in the area of sleep disorders and associated behavioural issues in young children and the effect chiropractic management may have.

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