CASE STUDY

Improvement in a Child with Transient Tachypnea of Newborn Following Chiropractic Care to Reduce Vertebral Subluxation: A Case Report

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Abstract

Objective: To report a dramatic improvement in respiratory rate and Apgar score in a newborn suffering from Transient Tachypnea of Newborn (TTN) following a reduction of vertebral subluxation.

Clinical Features: A newborn male presented with a respiratory rate of 93 breaths/min and an Apgar score of 6 at 1 and 5 minutes. Symptoms included inability to cry out loud, nasal flaring, and grunting. He was given the diagnosis of Transient Tachypnea of Newborn.

Interventions and Outcomes: A chiropractic examination of the baby’s upper cervical spine revealed vertebral subluxation at the atlanto-occipital region. An infant toggle recoil adjustment was given to reduce the subluxation. Within minutes of the adjustment the respiratory rate decreased to 80 breaths/min and Apgar score improved to a 9. At 5 hours after birth the respiratory rate was 70 breaths/min and at 12 hours after birth was 60 breaths/min.

Conclusions: The case of a newborn diagnosed with Transient Tachypnea of Newborn is presented. Respiratory rate, Apgar score, and other signs of TTN improved following an upper cervical adjustment to reduce vertebral subluxation. Further research on respiratory disorders in newborns and the efficacy of chiropractic is warranted.

Keywords: Transient Tachypnea of Newborn (TTN), vertebral subluxation, respiratory distress, atlas, adjustment, chiropractic, pediatrics, newborn

Introduction

Transient tachypnea of newborns (TTN) is a benign, self-limiting respiratory disorder presenting in the first 1-2 hours after delivery and usually resolving within 2 to 5 days of age.¹ ² It is suggested that it is a parenchymal lung disorder characterized by pulmonary edema resulting from delayed fetal lung fluid clearance and resorption.¹ TTN shows the following clinical signs: respiratory rate exceeding 60 breaths/min, nasal flaring, grunting, retractions, cyanosis, poor feeding.² The following other morbidities are ruled out before making the diagnosis of TTN: perinatal infection, persistent pulmonary hypertension, and meconium aspiration. While there is still limited information on its etiology and effective treatments, studies have suggested that cesarean delivery, low gestational age, and male gender are highly predictive factors of TTN.³

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It is labeled transient because most newborns recover on their own in an average of 48 hours. One study has shown that peak respiratory rates >90/min in the first 36 hours after birth are correlated with a 7.04-fold increase in prolonged tachypnea. Common treatments include antibiotics to prevent possible infection and respiratory support when needed, although most treatment is supportive due to the transient nature of the disorder.

Chiropractic treatment for TTN has not been researched. However, there have been multiple studies on chiropractic care and other respiratory problems. While chiropractic care has not been shown to be a treatment for any visceral problems directly, reports have shown a positive response between reduction of vertebral subluxation and improvement in visceral complaints, especially in children. This study reports one such case in which respiratory rate and Apgar scores improved shortly following chiropractic adjustments to the upper cervical spine, cranium, and sacrum on a baby with TTN.

**Case Report**

**History**

The subject is a newborn male weighing 8.1 lbs and measuring 21 3/8" at birth. Labor and delivery were performed as a homebirth. A Certified Practicing Midwife (CPM) was used for all prenatal, labor, delivery, and postnatal care. The nulliparous mother was in good health with no previous medical conditions or complications throughout pregnancy or labor. The birth occurred at 39 weeks + 2 days. The child was born vaginally with no medical interventions or surgical procedures. At delivery the patient presented as head-down, left occiput anterior with a right nuchal arm (right arm next to head). Immediately after delivery heart rate was recorded at 150 beats per minutes (normal range is >100 bpm). Apgar scores were taken at 1, 5, and 10 minutes. Apgar score at 1 minute was recorded at a 6 due to weak respiratory effort, bluish color, and grimacing reflex stimulation.

Respiratory rate at 1 minute was 93 breaths/min (normal for newborn is 40-60). A fetal stethoscope was used to listen to all quadrants of the lungs and it was confirmed that all lobes were filling with air. At two and a half minutes the baby was showing obvious signs of distress and presented with grunting, flaring nostrils, and gurgling sounds. Bulb suction was then used to clear obstructions in the mouth and throat.

Placenta and umbilical cord were left attached during this time to allow for complete transfer of cord blood. Apgar score at 5 minutes remained at 6 with no improvement from previous score. The newborn was still unable to cry explicitly and respiratory rate remained at 93 breaths/min. A Doctor of Chiropractic, who was also the Doula present during birth, was asked to examine the baby for possible vertebral subluxation in the upper cervical spine.

**Chiropractic Examination**

At approximately 5 minutes after birth static and motion palpation were performed on the upper cervical spine of the newborn. Static palpation was done with very light manual touch in the occipital and cervical region feeling for asymmetry and muscle tone. Taut muscle fibers were found at the right atlanto-occipital junction along with edema. Gentle motion palpation in rotation and lateral flexion found restriction at the right atlanto-occipital junction. Due to the umbilical cord and placenta being attached and the exam being performed at a home, further instrumentation or imaging was unavailable. A diagnosis of vertebral subluxation of the atlas was given following examination.

**Intervention**

Initial adjustment was made using Infant Toggle Recoil Technique. Contact was made with the tip of the chiropractor’s 5th digit onto the right atlas transverse process of the patient. Very light force was applied to the contact and sustained for approximately 5 seconds in a lateral to medial direction. After the adjustment was given, palpation was repeated to confirm reduction of taut muscle fibers and restoration of motion.

Toggle recoil is an upper cervical specific technique that normally utilizes radiography listings, instrumentation, and supine leg checks. Infant care is slightly modified and may include static and motion palpation of the upper cervical region to determine atlas laterality and rotation. This technique suggests that compression and distortion of the upper cervical spinal cord by misalignments at the atlas-axis vertebra can cause interference to the nervous system (vertebral subluxation).

In the case of infant toggle recoil, adjustment is usually made by a double-thumb contact on the atlas transverse process in a specific line of drive determined by radiology listing. The infant is usually side-lying and only sustained pressure is used. In this case, care had to be modified to accommodate for being out-of-office, the umbilical cord still attached, and the presentation of the patient.

**Outcomes**

Six minutes following the initial adjustment, the umbilical cord was cut and the mother and baby moved to a nearby bed. The CPM performed another examination on the baby. Apgar score at 10 minutes had improved to a 9 and respiratory rate had reduced to 80 breaths/min. The child also began to cough up more fluid and cry out loud. At this time, the CPM gave two puffs of oxygen from an oxygen tank to continue to facilitate respiratory improvement.

Respiratory rate was taken again at 1 hour and recorded at 74 breaths/min. At this time the baby was taking deeper breaths and crying more frequently. Five hours after birth the child’s respiratory rate had reduced to 70 breaths/min and he was able to cry at full strength. The following morning another examination was performed by the CPM. At 12 hours after birth the respiratory rate was at 60 breaths/min and all other findings were within normal range. The examination revealed no further complications with respiratory function and continued monitoring was the only treatment suggested.
Discussion

Transient Tachypnea of Newborn

While there is limited research on Transient Tachypnea of Newborn, it is known to be a benign condition that self-resolves in an average of 48 hours. Most sources have accepted that the pathophysiology of this condition is the delayed resorption of fluid in fetal lung following delivery. The most predictive factors for TTN are suggested to be low gestational age and cesarean section deliveries. Kasap et al. found that having peak respiratory rates above 90 breaths/min was found to be 7.04-fold suggestive for prolonged tachypnea. In that study, infants with prolonged tachypnea showed significantly higher hospitalization durations and antibiotic intervention. TTN has been shown to become a more serious situation in rare cases causing hypoxia, respiratory distress, pulmonary air leak syndromes, and persistent pulmonary hypertension.

It is interesting to note that in this particular case, the infant had neither low gestational age nor a cesarean delivery. Takaya et al. suggested that further risk factors for TTN could be nulliparity and Apgar scores below 7 at 1 minute. The patient in this case did fit both of these criteria.

Another interesting note in this particular case was that the patient’s peak respiratory rate was 93 breaths/min. Kasap et al. showed that this high of a peak respiratory rate (>90) in the first 36 hours was highly suggestive of prolonged TTN and worse prognosis. However, the patient in this case showed improvement within minutes and had fully recovered within 12 hours. With the average recovery rate for TTN being 48 hours, this case shows a much faster recovery.

Chiropractic Care

There was no research found on chiropractic care and the effects on transient tachypnea of newborns. There were, however, studies found on chiropractic care and children suffering from other respiratory problems such as asthma, respiratory syncytial virus, bronchitis, and cystic fibrosis.

A review of literature done by Prax on upper cervical chiropractic care and pediatric patients showed 25 studies suggesting positive outcomes for children under chiropractic care. Among these were cases of bronchitis and asthma. In a very recent study done by Whittle-Davis and Czegus, a 23-month-old patient showed improvement in asthma, sinus problems, and frequency of colds after chiropractic care.

Kachinsky and Kachinsky reported improvement of exacerbations of asthma and rescue inhaler usage in a 3-year-old after one month of chiropractic care. Warhurst, Warhurst, and Gabai reported a decrease in respiratory distress and recurrent infection in an 8-year-old with cystic fibrosis. Marino and Butt reported a retrospective case of a twenty-one-month-old child diagnosed with respiratory syncytial virus (RSV). After three months of chiropractic care the child no longer needed nebulizer treatments for RSV and had experienced no further RSV symptoms by the age of 4.

Many hypotheses exist on how upper cervical vertebral subluxations effect respiratory and autonomic functions. The respiratory centers are located in the medulla oblongata of the brainstem. The lower end of the medulla passes through the foramen magnum and into the upper cervical spine. When pressure is applied to the medulla, it could affect functions performed by cardiovascular and respiratory systems. In a study of 695 infants between the ages of 1 and 12 months, Koch et al. showed that mild mechanical irritation of the high cervical spinal cord caused changes in heart rate and respiratory rate. Kessinger studied respiratory function (using spirometry) in 55 patients before and after receiving chiropractic care for the correction of upper cervical vertebral subluxation. That study found significant improvement in respiratory functions fairly rapidly following upper cervical adjustments.

Limitations of this study include the fact that this is only one particular case and no other similar cases have been reported. Also, objective findings of vertebral subluxation and reduction of vertebral subluxation such as instrumentation and radiography were unavailable due to the given settings. Regardless, this case suggests the fact that further research should be done in infants with TTN and other respiratory disorders and the effects of chiropractic care to reduce vertebral subluxation.

Conclusion

The case of a newborn diagnosed with Transient Tachypnea of Newborn is presented. Respiratory rate, Apgar score, and other signs of TTN improved dramatically following an upper cervical adjustment to reduce vertebral subluxation. Further research on respiratory disorders in newborns and the efficacy of chiropractic is warranted.

References


