

# CASE STUDY

## Resolution of Chronic, Recurrent Bilateral Ear Infections Following Chiropractic Care in a One-year-old Infant: A Case Report & Review of the Literature

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### Abstract

**Objective:** To describe the care of an infant with a chief complaint of recurrent ear infections and review the current literature.

**Clinical Features:** A one-year-old infant with a chief complaint of chronic, recurrent ear infections presented for chiropractic care. The child suffered four bilateral ear infections in a period of six months. Medical care consisted of prescribed antibiotics. The ear infections interfered with the child's sleep and caused extreme irritation in the child's attitude. A full spine examination revealed subluxations throughout.

**Intervention and Outcome:** The patient was cared for with toggle recoil/headpiece and Logan Basic. Care frequency was set at 1-2 times per week for 6 weeks and adjusted accordingly for the presence of spinal subluxation. The patient received a total of 9 adjustments over the 6-week period with resolution and non-recurrence of the child's OM.

**Conclusion:** This case report adds to the growing literature on the effectiveness of subluxation-based chiropractic care in children presenting with a history of medically diagnosed OM.

**Keywords:** *Pediatric, recurrent ear infections, toggle headpiece, Logan Basic, chiropractic, subluxation, otitis media*

### Introduction

Before the age of 3 years, 80% of children will experience at least one episode of otitis media (OM) and by the time they are 5 years of age, approximately 40% of children will experience multiple episodes of acute OM. Characterized as an infectious inflammatory process of the middle ear, OM can cause symptoms of otalgia, fever, headache, irritability and listlessness and if not addressed, may lead to hearing impairment or other problems that can adversely affect a child's quality of life (QoL) as well as that of their parents' and other family members.<sup>1,2</sup> Concerns by parents with their

child's pain, disturbed sleep and irritability combined with a "wait and see" medical approach has motivated parents to seek alternative healthcare for their child.<sup>3</sup> This may involve acupuncture, homeopathic remedies, herbal remedies, vitamin supplementation, probiotics and of interest in this case report, chiropractic.<sup>4</sup> Of the practitioner-based alternative therapies, chiropractic is the most popular and highly sought after by parents for their children.<sup>5,6</sup> Following the principles of evidence-informed practice, we describe the chiropractic care of an infant with recurrent ear infections.

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## Case Report

A one-year-old infant was presented by her parents for consultation and possible chiropractic care. The infant presented with a chief complaint of recurrent ear infections. The child had suffered 4 bilateral ear infections over the previous 5 months. She was diagnosed by her primary care physician with each ear infection and was prescribed antibiotics with each occurrence. After each antibiotic use, the child's symptoms would resolve but returned within one month of finishing the antibiotics. The ear infections were reportedly interfering with the child's sleep and causing extreme irritation in the child's attitude. Parents also reported the child had frequent colds, sinus congestion, and food allergies. Child was born at 37 weeks old via scheduled cesarean section due to pre-eclampsia in the mother. Medical history revealed no significant trauma and all developmental milestones were reached as expected.

The examination of the patient included a static bony palpation of the spine, motion palpation of the spine and muscle palpation along the paraspinal muscles in addition to prone leg checks. Static palpation of the spine revealed a more prominent C<sub>1</sub> on the right side compared to the left. Motion palpation revealed decreased right lateral flexion at the atlanto-occipital joint relative to left lateral flexion. Muscle palpation revealed hypertonic intertransversari muscles on the right side at the vertebral level of C<sub>1</sub> when compared to the left side. The patient also showed apprehension and tried to push the doctor's hand away when the right transverse process of the atlas was palpated. Prone leg checks revealed a right leg that was shorter than the left leg by 0.25 inches. There was a natal cleft deviation to the left and a hypertonic sacrotuberous ligament on the left side.

With the consent of the child's parents, a trial of chiropractic care using toggle-recoil and Logan Basic was approved. Spinal adjustments were applied to correct the patient's atlas and sacral subluxations. A portable pediatric toggle head-piece was utilized for this purpose to accommodate for the patient's size. With the patient in a seated position and her left ear placed against the toggle head-piece, a toggle-recoil thrust on the patient's right transverse process of atlas was applied. Following the spinal adjustment, the patient was allowed to rest for ten minutes and play with her toys in the room in order to allow her to acclimate to the toggle recoil adjustment.

After ten minutes, the patient was re-examined. Notable findings included the elimination of the leg length discrepancy with the patient in the supine and prone positions, a reduction of hypertonicity of the intertransversari muscle, an increase in right lateral flexion at the atlanto-occipital joint, and a less prominent C<sub>1</sub> on the right side. Sacral adjustments were performed using the Logan Basic technique with sustained pressure on the left sacrotuberous ligament until release of tension is felt by practitioner. The child presented with an AI-L sacral subluxation and therefore pressure was applied to the left sacrotuberous ligament when indicated throughout the patient's care plan. After the adjustment the hypertonicity decreased in the left sacrotuberous ligament and natal cleft deviation resolved.

The patient was scheduled for care at 1-2 times per week for

the next 6 weeks and adjusted accordingly for the presence of spinal subluxation. The patient received a total of 9 adjustments over the 6-week period as described above with toggle recoil and Logan Basic. At the conclusion of the care plan a progress exam was performed and a new care plan of 1-2 visits/month for 3 months was established. At the latest progress exam 6 months after beginning care, the parents reported she had not had an ear infection or symptoms of an ear infection since beginning care. They also reported she had significant improvements in mental development, flexibility, sleep, and coordination. She has seen a decrease in frequency of cold and allergy symptoms, and her irritability has resolved.

## Discussion

Acute OM is such a common condition that it is considered one of the leading causes of visits to medical clinics and for prescription antibiotics.<sup>7</sup> Despite differences in research design and disease definitions, the World Health Organization (WHO) estimated that 28 thousand deaths yearly is attributable to complications (i.e., death through meningitis and brain abscess) of OM.<sup>8</sup> Monasta and colleagues<sup>9</sup> estimated that acute OM has an incidence rate globally of 10.85% or 709 million cases each year with 51% of these occurring in under 5 year olds.

Globally each year, these investigators also estimated that approximately 21 thousand people or 33 per 10 million people, die due to the complications of OM. The highest mortality is in children in their first year of life (i.e., 85.4 per 10 million) and in those 1-4 years of age (i.e., 90.5 per 10 million). In developed countries such as the United States, the United Kingdom and Australia, the most common morbidity of OM is conductive hearing loss due to middle ear effusion. Infants with severe and recurrent OM and persistent middle ear effusion are at risk for problems in behavior and development of speech, language and cognitive abilities. For parents, OM of their child adversely impacts them in such a way that they report interrupted sleep, worrying, altered daily schedule and less leisure time.<sup>10</sup> The economic impact of OM in the United States is significant and has been estimated at >\$5 billion.<sup>7</sup> In Australia, the cost of treatment for OM has been estimated between AUS\$100-400 million, excluding the costs of care for complications and co-morbidities.<sup>11</sup> According to Taylor et al.<sup>11</sup>, these costs were mainly for visits to general practitioners and medicines with antibiotic prescribing rates high despite clear evidence for a limited benefit from antibiotics for most OM cases.

Preventive actions on the part of parents (particularly for mothers) such as breastfeeding, smoking avoidance during and after pregnancy, and avoiding exposure to indoor air pollution can prevent acute OM and its complications and sequelae.<sup>12-14</sup> These action steps also apply as preventative means for many other infant and child conditions. We would also add here the role of regular chiropractic care for infants.

In terms of medical care, frustrations within and outside the medical profession abound, particularly for parents given the wide variation in practice patterns for treating children with persistent and recurrent OM<sup>15-16</sup> as well as "watchful waiting".<sup>17</sup> Furthermore, despite the treatment of choice, there is now persuasive evidence that antibiotic therapy (i.e.,

amoxicillin) provides limited clinical benefit and promotes bacterial resistance.<sup>18</sup> As a result, parents are turning to alternative therapies for the care of their child, particularly with chiropractic care.<sup>17</sup>

### Chiropractic Care

As a context to further discussions on chiropractic care of children with OM, we examine the literature thus far. In 2012, Pohlman et al.<sup>19</sup> performed a systematic review of the literature on the use of spinal manipulation for otitis media. The investigators found 49 articles meeting their inclusion criteria for final evaluation. With chiropractic, there were 14 case reports, 4 case series and one clinical trial. The investigators utilized a checklist developed by the Canadian Medical Association Journal<sup>20</sup> to assess the quality of case reports, Yang et al.<sup>21</sup> developed the checklist for case series CONSORT (Consolidated Standards of Reporting Trials) was used for the clinical trials<sup>22</sup> and QUORUM (Quality of Reporting of Meta-analyses) was used to evaluate the review articles.<sup>23</sup> Pohlman et al.<sup>19</sup> concluded on their analysis of the literature that there was currently no evidence to support or refute using SMT for OM and no evidence to suggest that SMT produces serious adverse effects for children with OM. We note here however that these conclusions are based on the post-positivist paradigm of research where randomized clinical trials are the gold standard and hold the highest level of evidence.

We follow-up with an update of the literature specific to chiropractic and the care of children with OM. We utilized the databases Index to Chiropractic Literature (2012-2017), MANTIS (2012-2017) and Pubmed (2012-2017) using the search terms “otitis media OR ear infections.” We found 7 manuscripts (all case reports) describing the chiropractic care of infants with ear infections. We note that a number of these case reports performed a literature review as well. For the benefit of the reader, we provide a narrative review here.

Stone-McCoy and Natori<sup>24</sup> described a 13-month-old male presented with complaints of otitis media born prematurely and delivered through cesarean. At birth his blood contained opiates, methamphetamine and other amphetamines. The patient had been experiencing bouts of otitis media since three months of age and had previously been managed by medical doctors with rounds of antibiotics and nasal saline. Chiropractic analysis revealed subluxations were located in the cervical, thoracic, lumbar and sacroiliac joint region when analyzed and were adjusted using the Activator Adjusting Instrument (AAI). His mother reported that her child's OM resolved a week after initiating care.

Steinberg and Doerr<sup>25</sup> described the care of a 2-year-old female presenting with a history of ear infections accompanied with fever. The first episode occurred when the patient was one month old, and the patient had been under regular antibiotic use. The child received chiropractic care using MC2 Technique utilizing an Integrator hand held adjusting instrument. After 36 visits, the patient's OM resolved.

Ferranti et al.<sup>26</sup> described a four-year old male with a history of failed tympanostomy tube surgery under chiropractic care. The child was scheduled for repeat tympanostomy surgery. On

the third visit, the patient's mother opted out of her son's scheduled surgery. The patient attended care with the recommended frequency at 2-3 times for the first two weeks, followed by once a week for eight weeks, for a duration of 12 weeks. The chiropractic care was adjustments with the Activator hand held adjusting instrument. The case report by Dunn-Sigouin<sup>27</sup> involved a 23-month-old female with 6 acute otitis media episodes since the age of 6 months. The patient received 6 full spine diversified chiropractic adjustments with myofascial release of cervical muscles and effleurage of the frontal and maxillary sinuses over the course of one month. Thereafter, the frequency of care was changed to 1 visit per 2 weeks, 1 visit per month and lastly, prevention visits at 1 visit per 2 months or whenever the patient presented with cold symptoms. According to the author, during the year following the patient's first chiropractic visit, the patient continued chiropractic care every two months and has had no reoccurrence of AOM.

O'Connor and Schneider<sup>28</sup> reported in a 9-year-old girl with chronic ear infections, neck pain and headaches. According to her mother, the patient was medically diagnosed with chronic OM and recently scheduled for tympanostomy tube surgery. The patient was cared for with high-velocity, low amplitude adjustments (i.e., Diversified Technique) particularly at the C1, C4 and L4 vertebral levels at 3 times per week for three weeks. Over the course of care, the patient no longer experienced episodes of headache and neck pain. Her otolaryngologist reported a 95% improvement in a previous diagnosed hearing loss. Accordingly, the myringotomy tube procedure was cancelled.

Stone-McCoy and Korn<sup>29</sup> described the care of a 16-month old male with a history of recurrent ear infections. The child's ear infections began at 14 months of age and since then he has had four medically diagnosed bilateral ear infections all treated with antibiotic therapy without resolution. The mother sought out chiropractic care in order to avoid the insertion of tympanostomy tubes recommended by the pediatrician. The child was cared for with an Activator instrument and sustained contacts type adjustments. Cranial adjusting, sinus work, and soft tissue effleurage of sternocleidomastoid were also utilized. The patient showed immediate decrease in symptoms in the first week of care. During the fourth week of care, the infant had an appointment with the pediatrician revealing bilateral ear infections to be resolved. With continued chiropractic care, the patient has not experienced any recurrence of ear infections.

Lanjopoulos and Lanjopoulos<sup>30</sup> described the care of a two year old female with complaints of chronic OM, inability to sleep through the night, and skin sensitivities/tactile hypersensitivity to clothes and touch. Medically diagnosed with chronic ear infections and a fractured clavicle due to birth trauma, the patient also had episodes of temper tantrums and violence towards her older sister. The patient received chiropractic care utilizing the Activator Methods Technique. After three adjustments the patient slept through the night for the first time. After four months of care she no longer had ear infections, was consistently sleeping through the night, was less irritable, able to wear clothes without discomfort, and much more willing to hug and be held.

Our case report contributes to the existing literature on the care of one of the youngest patients presenting for care with a history of OM vis a vis adjustments of vertebral subluxations using toggle-recoil and Logan Basic technique.

In closing, we provide the customary caution to the reader on the lack of generalizability of the case reported based on a post-positivist research perspective. That is, all observations are fallible and we cannot trust our senses. The presence of bias due to a lack of a control group and randomization, possible spontaneous remission and the natural history of pubic symphysis dysfunction all provide completing explanations on the reported benefits in the patient described. However, from a constructivist perspective where a person's perception creates their reality, one could argue that the success of this case report forms the basis for our generalization in caring for similar patients.

### Conclusion

This case report adds to the growing literature on the effectiveness of subluxation-based chiropractic care in children presenting with a history of medically diagnosed OM. We support continued documentation in the care of similar patient to inform clinical practice and higher-level research designs.

### References

- Mittal R, Lisi CV, Gerring R, Mittal J, Mathee K, Narasimhan G, Azad RK, Yao Q, Grati M, Yan D, Eshraghi AA, Angeli SI, Telischi FF, Liu XZ. Current concepts in the pathogenesis and treatment of chronic suppurative otitis media. *J Med Microbiol.* 2015;64(10):1103-1116
- Boruk M, Lee P, Faynzilbert Y, Rosenfeld RM. Caregiver wellbeing and child quality of life. *Otolaryngol Head Neck Surg.* 2007;136:159-168.
- Barber C, Ille S, Vergison A, Coates H. Acute otitis media in young children - what do parents say? *Int J Pediatr Otorhinolaryngol.* 2014 Feb;78(2):300-306.
- Marom T, Marchisio P, Tamir SO, Torretta S, Gavriel H, Esposito S. Complementary and Alternative Medicine Treatment Options for Otitis Media: A Systematic Review. *Medicine (Baltimore).* 2016;95(6):e2695
- Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States, 2007. *Natl Health Stat Report.* 2008;(12):1-23.
- Black LI, Clarke TC, Barnes PM, Stussman BJ, Nahin RL. Use of complementary health approaches among children aged 4-17 years in the United States: National Health Interview Survey, 2007-2012. *Natl Health Stat Report.* 2015;(78):1-19.
- Klein JO. The burden of otitis media. *Vaccine* 2000;19 Suppl 1: S2-S8
- Acuin J (2004) Chronic suppurative otitis media - Burden of Illness and Management Options. Geneva: World Health Organization. Accessed Aug 1, 2017 at: <http://apps.who.int/iris/handle/10665/42941>
- Monasta L, Ronfani L, Marchetti F, Montico M, Vecchi Brumatti L, Bavcar A, Grasso D, Barbiero C, Tamburlini G. Burden of disease caused by otitis media: systematic review and global estimates. *PLoS One.* 2012;7(4):e36226
- Holl K, Rosenlund M, Giaquinto C, Silfverdal SA, Carmona A, Larcombe J, Garcia-Sicilia J, Fuat A, Muñoz ME, Arroba ML, Sloesen B, Vollmar J, Pirçon JY, Liese JG. The Impact of Childhood Acute Otitis Media on Parental Quality of Life in a Prospective Observational Cohort Study. *Clin Drug Investig.* 2015;35(10):613-624
- Taylor PS, Faeth I, Marks MK, Del Mar CB, Skull SA, Pezzullo ML, Havyatt SM, Coates HL. Cost of treating otitis media in Australia. *Expert Rev Pharmacoecon Outcomes Res.* 2009;9(2):133-141
- Paradise JL, Rockette HE, Colborn DK, Bernard BS, Smith CG, et al. Otitis media in 2253 Pittsburgh-area infants: prevalence and risk factors during the first two years of life. *Pediatrics* 1997; 99: 318-333.
- Cook DG, Strachan DP. Health effects of passive smoking-10: Summary of effects of parental smoking on the respiratory health of children and implications for research. *Thorax* 1999; 54: 357-366.
- Bruce N, Perez-Padilla R, Albalak R. Indoor air pollution in developing countries: a major environmental and public health challenge. *Bull World Health Organ* 2000; 78: 1078-1092.
- Roark R, Petrofski J, Berson E, Berman S. Practice variations among pediatricians and family physicians in the management of otitis media. *Arch Pediatr Adolesc Med.* 1995;149(8):839-844
- McIsaac et al., 2000 McIsaac WJ, Coyte P, Croxford R, Harji S, Feldman W. Referral of children with otitis media. Do family physicians and pediatricians agree? *Can Fam Physician.* 2000;46:1780-2, 1785-8.
- Levi et al., 2013 Levi JR, Brody RM, McKee-Cole K, Pribitkin E, O'Reilly R. Complementary and alternative medicine for pediatric otitis media. *Int J Pediatr Otorhinolaryngol.* 2013;77(6):926-31
- Pappas DE, Owen Hendley J. Otitis media. A scholarly review of the evidence. *Minerva Pediatr.* 2003;55(5):407-414.
- Pohlman KA, Holton-Brown MS. Otitis media and spinal manipulative therapy: a literature review. *J Chiropr Med.* 2012;11:160-169
- Squires BP. Case reports: what editors want from authors and peer reviewers. *CMAJ* 1989;141:379-380
- Yang AW, Li CG, Da CC, Allan G, Reece J, Xue CC. Assessing quality of case series studies: development and validation of an instrument by herbal medicine CAM researchers. *J Altern Complement Med* 2009;15:513-522
- Schulz KF, Altman DG, Moher D. CONSORT 2010 statement: updated guidelines for reporting parallel group randomized trials. *BMJ* 2010;340:c332
- Moher D, Cook DJ, Eastwood S, Olkin I, Rennie D, Stroup DF. Improving the quality of reports of meta-analyses of randomized controlled trials: the QUOROM statement. Quality of reporting of meta-analyses. *Lancet* 1999;354:1896-900

24. Stone-McCoy P, Natori C. Chiropractic care of a toddler with otitis media born premature and exposed prenatally to opiates and amphetamines: A case study and selective review of literature. *J Pediatr Matern & Fam Health - Chiropr.* 2017 Winter;2017(1):1-7
25. Steinberg B, Doerr A. Resolution of chronic otitis media, constipation and sleep disturbance following adjustment of subluxations in a 2-year-old child: A case study and review of literature. *J Pediatr Matern & Fam Health - Chiropr.* 2016 Summer;2016(3):75-79
26. Feranti M, Alcantara J, Brinkley C. Chronic otitis media, failed tympanostomy tube surgery and resolution following adjustment of vertebral subluxation. *J Pediatr Matern & Fam Health - Chiropr.* 2016 Winter;2016(1):5-8
27. Dunn-Sigouin K. Resolution of recurrent acute otitis media in a child undergoing chiropractic care: A case report. *J Clin Chiropr Pediatr.* 2015;15(1):1203-1206
28. O'Connor K, Schneider G. Resolution of otitis media, improvement in hearing and avoidance of myringotomy tubes following chiropractic care in a child: A case report and selective review of literature. *J Pediatr Matern & Fam Health - Chiropr.* 2014 Summer;2014(3):47-54
29. Stone-McCoy P, Korn C. Resolution of otitis media and avoidance of tympanostomy tubes in a 16-month old with birth trauma following subluxation based case: A case study and selective review of literature. *J Pediatr Matern & Fam Health - Chiropr.* 2013 Spring;2013(2):39-46
30. Lanjopoulos C, Lanjopoulos D. Resolution of chronic otitis media, difficulty sleeping, and tactile hypersensitivity in a child undergoing subluxation-based chiropractic care. *J Pediatr Matern & Fam Health - Chiropr.* 2012 Summer; 2012(3): 81-84