



## Otitis Media and Asthma: A Chiropractic Perspective

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### Introduction

Otitis media and asthma are two of the most common pediatric disorders which require clinical intervention. Otitis accounts for over 50% of all pediatrician visits for children under the age of 5.<sup>1</sup> The incidence of asthma is rising, with urban areas accounting for the majority of that rise.<sup>2</sup> While medical science continues to treat these conditions as separate and distinct conditions with differing etiologies, chiropractic, from a clinical perspective has another view with respect to similar etiologies and mechanism of cause.

Few studies have been undertaken in the chiropractic profession as to the benefits of chiropractic care for otitis or asthma. Two studies for otitis, one done by Froele, and another by this author, had limitations, as one was a retrospective study and the other was a pilot study.<sup>3,4</sup> Outcome measures were somewhat limited, although the pilot study gives direction with respect to doing future research. A more recent feasibility study done by Sawyer et.al. confirmed the pilot study's findings that tympanoscopy could be a valid outcome measure. Sawyer further goes on to say that a controlled study utilizing a sham adjustment would be possible and valuable.<sup>5</sup>

For asthma, Nielsen et. al. in 1995 looked at some outcome measures with respect to a crossover design. He found that while the primary outcome measures showed no difference, two of the secondary outcome measures did.<sup>6</sup> In 1998, in the *New England Journal of Medicine*, Balon et. al. demonstrated that there were no significant differences between the control group and the active adjustment group. Problems with sham adjustments were clearly present in this study as well as a doubt as to the blinded role of the practitioner.<sup>7</sup> In 2001, Bronfort repeated his study, and again found no change in lung function tests as an outcome measure, but found the quality of life to be significantly better after chiropractic care. In this study he questions the role of the contact with the doctor of chiropractic as a bias in the study.<sup>8</sup>

Even though scientific studies of the benefits of chiropractic care for children diagnosed with otitis media and asthma are limited, parents continue to bring their children to doctors of chiropractic for care for both these conditions. It is therefore important for the DC to be aware of these health disorders, their etiologies, their pathophysiologies and their pertinence in clinical practice.

### Otitis Media

The pathogenesis of otitis media has received much attention in the last few years. With the rise of otitis in the pedi-

atric population and an increase in the mores of the community that help create the problem, such as an increase in the use of day care facilities, otitis has become a focus for pediatricians, and for parents.<sup>9</sup> Otitis media takes on varied forms including chronic suppurative, and acute purulent.

The pathogenesis is thought to be multifactorial. Table 1 demonstrates the factors which are associated with an increased risk of otitis media. These conditions are varied and serve as a guide for some of the external conditions which may contribute to the etiology of otitis media, especially in the very young child.<sup>9,10</sup>

**TABLE 1.**  
**Sibling History of Otitis Media**

- Male
- Non-Breastfed
- Exposure to second hand smoke
- Group day care
- Early onset of otitis
- Seasonal effects
- Allergy
- Prior antibiotic use
- Immuno compromise
- Maternal use of antibiotics during pregnancy
- Downs syndrome
- Eskimo/Native American

Briefly, this is the allopathic view: otitis occurs when an event such as an upper respiratory infection results in congestion and swelling of the mucous membranes of the respiratory system. This congestion results in obstruction of the narrow isthmus separating the bony ET from the cartilaginous one. This promotes the formation of an obstructed ET, which in turn promotes the buildup of fluid in the middle ear. The fluid which is present in the middle ear can become stagnant and become a breeding ground for bacterial infection. With the swelling of the tonsils and adenoids, which aid in fighting the infection, the ET is further compromised. This also can aid in the formation of otitis media.<sup>11,12,13</sup>

Common allopathic interventions for otitis media include: antimicrobial agents, serial antibiotics, prophylaxis with antimicrobials, myringotomy, tympanostomy, surgical removal of the tonsils and adenoids, steroids, and laser treatment of the tympanic membrane. These interventions, especially the use of antimicrobials, are generally based on subjective criteria which include signs and symptoms as well as inspection of the tympanic membrane.<sup>12,13</sup>

### Asthma

Asthma is defined as the bronchoconstriction or bronchospasm of the smooth muscles of the lungs resulting in acute or chronic lung disease. This is

characterized by wheezing during expiration during an asthmatic attack. The smooth muscle around the airways contract, thus narrowing the airways. Inflammation causes further narrowing. When the asthmatic pushes air out of the lungs on expiration, the narrowed airways exert significant pressure on the sides of the airways producing a wheeze. The narrower the airway, the higher pitched the wheeze. Wheezing upon inspiration is generally due to an upper airway obstruction such as a foreign body lodged in the airway.<sup>14,15,16</sup>

Characterized as either intrinsic or extrinsic in nature, the causes of asthma are quite varied. They range from the intrinsic form, from allergy to stress, and in the extrinsic form, from cold and exercise to second hand smoke. There are many triggers for an asthmatic to start wheezing, and the severity and duration of an attack is not always related to a trigger. With asthma, two things are happening in the lungs: constriction (the tightening of the muscles around the airways) and inflammation (the swelling and irritation of the airways). Each of these processes are mediated by the nervous system.<sup>14,16</sup>

New allopathic treatment of this condition generally involves the use of beta-2 agonists, and steroids. The beta-2 agonists generally relax the smooth muscles and the airways open to restore breathing. The steroids reduce swelling and decrease the mucous production.<sup>17</sup>

### Neurosubluxative models

While both otitis media and asthma account for a significant majority of pediatric morbidity, they have not been examined for their relative similar modes of action, and their similar behavior with respect to the nervous system. Further, they share a similar trait in that during an "attack" they each prevent transportation of fluid or air into or out of the affected area. With otitis, the fluid from the middle ear is unable to drain through the Eustachian tube, and with asthma, air is unable to be transported into or out of the lungs due to narrowing of the bronchi. So whether it is narrowing of the Eustachian tube or narrowing of the bronchi, one thing is common — narrowing is ultimately caused by a neurological response.<sup>4</sup>

Multiple models of subluxation with respect to otitis have been presented over the years with the pilot study presenting the Vertebral Cranial Subluxation Model, and another, presented by Schmiedel, which examines the sympathetic response of the body with respect to vasomotor elements, and the natural functions of yawning and swallowing.<sup>4,18</sup>

In my pilot study I outlined the various components of subluxation with respect to otitis media based on Lantz's work.<sup>4,19</sup> The components include mechanical, myologic, lymphatic, inflammatory, and neurologic. Looking strictly at the neurological component I believe that the pharyngeal orifice of the Eustachian tube is innervated by a branch from the otic ganglion, the sphenopalatine nerve, and the pharyngeal plexus. The remainder of the tube receives its sensory innervation from the tympanic plexus and the pharyngeal plexus. The most important component of the tube innervation is the glossopharyngeal nerve

as it plays the predominant role in tubal innervation. Sympathetic innervation of the tube depends upon the sphenopalatine ganglion, otic ganglion, paired glossopharyngeal nerves and the caroticotympanic nerve. Ito, in 1987, described the innervation of the tensor veli palatini muscle as coming from the ventromedial part of the trigeminal motor nucleus through the mandibular branch of the trigeminal nerve. Injury to the trigeminal nerve can bring about changes in ET function. ET dysfunction is one neurological mechanism that can bring about otitis media.<sup>4,20</sup>

Similar issues exist for asthma. It has long been held in more conservative chiropractic circles that asthma results from subluxation affecting the sympathetic nervous system producing an under-functional state, or a subluxation of the sympathetic system and an over production of parasympathetic nervous supply. While this scenario is somewhat simplistic by definition, its more sophisticated counterpart still retains portions of this type of thinking.<sup>21</sup> The pathophysiology of the asthma attack is as follows: the presence of an allergen activates T-lymphocytes, mast cells, and eosinophils to be produced which then go to the site of the allergen. There is a subsequent release of cytokines, interleukin-4, TNF and IgE.

This in turn stimulates mast cells, monocytes, macrophages and Thelper-2 lymphocytes and release of histamines, lipoxides, and platelet activating factors. The presence of these substances, especially the macros, Th2 and monocytes, stimulate the nerve cells to release vasoactive intestinal peptide and nitrous oxide. It is this release by the nervous system which is the final common pathway for asthma. The nervous cell release ultimately causes an increase in mucin production, hypertrophy and hyperplasia of smooth muscle. It is this nervous system response that causes the well-known symptoms and sequelae of chronic asthma which are: thickened airways, mucous production, acute edema and chronic collagen buildup along the alveoli, which become permanent.<sup>21,22</sup>

### Conclusion

So in looking at both otitis media and asthma, one can see by examining the pathophysiology of each disorder, that there is a common neurological component that controls the occurrence and the severity of the condition. Given the

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## SURVIVAL VALUES

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pects of Chiropractic, from the science to the art.

You were given a sacred trust, are you guarding it well?

### References

1. Stephenson, R.W. Chiropractic Textbook, 1927. p.93.
2. Stephenson, R.W. Chiropractic Textbook, 1927. p.94.

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