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The effect of lumbosacral manipulation on growing pains

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ABSTRACT

Background: Growing pains are a frequent clinical presentation that continues to puzzle practitioners, with very little conclusive evidence in any medical field, including chiropractic.

Objective: The aim of this study was to determine whether lumbosacral manipulations have an effect on growing pain symptoms.

Methods: Thirty participants with growing pains between the ages of 4 and 12 years were recruited. The participants were placed into two groups of 15 participants each. Group 1 received lumbosacral manipulations to restricted joints as determined by motion palpation, while Group 2 never received any professional intervention. Often parent(s)/guardian(s) of children who suffer from growing pains will rub the child's legs and offer verbal reassurance in an attempt to console their children. Parent(s)/guardian(s) of both groups were encouraged to continue to do this throughout the duration of the trial. Instructions were given to the parents so that the same rubbing technique and rubbing cream (aqueous cream) were used. Subjective changes were tracked using a pain diary that the parent(s)/guardian(s) were asked to complete, a six-week post-study follow-up question regarding children's growing pains and the Oucher self-report pain scale. Objective measures consisted of pressure algometer readings of the tibialis anterior muscle belly.

Results: The statistical data was analysed using the Friedman test, Mann–Whitney test and the Wilcoxon Signed-Rank test. The results demonstrated that both groups responded favourably to their specific treatment over time. However, the group that received lumbosacral manipulations proved to show a quicker response to treatment; and the post-study follow-up of this same group showed markedly more positive feedback than the group that did not receive the treatment. These results highlighted the positive effects of chiropractic manipulation on growing pain symptoms.

Conclusion: The results from this study, specifically the feedback from parent(s)/guardians(s) and the pain diaries, indicated that spinal manipulation is beneficial in the treatment of growing pains. The results also showed that other methods of treating growing pains, such as simple leg rubs, may also bring relief.

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1. Introduction

1.1. Background

French physician, Marcel Duchamp, first described growing pains (GP) in 1823 (Evans, 2008). According to Evans, Scutter, Lang, and Dansie (2006), Peterson provided the best definition in 1986 (Peterson, 1986). He defined GP by inclusion and exclusion criteria. The inclusion criteria were: intermittent pains in both legs (non-articular in location) that are generally present late in the day or at night time, often waking the individual. The exclusions were: physical signs (swelling, redness, trauma, reduced joint range, limping) and objective findings (blood tests, imaging).

1.2. Prevalence

According to Uziel and Hashkes (2007), growing pains diagnosed by typical clinical symptoms are the most common form of episodic childhood musculoskeletal pain occurring between the ages of 3 and 12 years. However, according to Lowe and Hashkes (2008), GP tend to occur in children aged 4–14 years. The prevalence of GP has been reported in nine separate studies since 1928 (Evans & Scutter, 2004b). Evans and Scutter (2004b) have estimated the global prevalence of GP, as defined by Peterson, in children 4–6 years of age to be at 36.9%.

1.3. Aetiology

Many authors agree that there is no conclusive aetiology for GP (Al-Khattat & Campbell, 2000; Evans, 2008; Evans & Scutter, 2004a, 2007; Evans et al., 2006; Lowe & Hashkes, 2008; Uziel & Hashkes, 2007). Furthermore the term "growing pains" is thought to be a contradiction as there is no evidence that the process of growth is painful, the peak incidence of pain does not conincide with peak growth periods and pain does not occur at sites where growth is thought to take place (Lowe & Hashkes, 2008).

Despite the uncertainty of the aetiology, three main theories dominate the literature – the anatomical, fatigability and psychological models (Evans, 2008). According to the anatomical theory, the cause of the leg pain is due to a postural or orthopaedic defect that could induce bad posture or stance and that treatment of the defect can be clinically observed to give relief (Evans & Scutter, 2007). The fatigability theory is periodically mentioned and is based on the belief that there is an accumulation of metabolic waste products within the leg muscles; this theory, however, remains untested. The theory was developed since parents often associate episodes of GP with periods of increased physical activity (Evans et al., 2006). According to the psychological theory, increased vulnerability to pain is suspected, as well as a familial predisposition. There is dissent regarding gender bias, where girls have historically been regarded as more susceptible to GP than boys (Evans, 2008).

Chiropractors typically consider the anatomical (biomechanical) and pain referral aetiology, whereby pain from distant origins such as the lower back refer into the legs, as points where they could have an influence. According to Alcantara and Davis (2011), a chiropractic approach lends itself to supporting an anatomical aetiology of growing pains, albeit from a chiropractic perspective. It is thought that the solution lies in an understanding and appreciation of the biomechanical relationship between the spine, the pelvis and the lower extremities as this biomechanical relationship is bi-directional in nature.

1.4. Management

Evans et al. (2006) conducted a prevalence study in South Australia and found that approximately one-third (35.9%) of parents sought professional advice concerning their child's GP condition. Of those who did, the majority consulted a doctor (26.8%). Other health professionals consulted included chiropractors (4.9%), podiatrists (3.8%), and medical specialists (3.1%). Only 5% of cases of the children taken to consult a health professional were investigated or treated.

There is no typical treatment prescribed in any of the presenting studies. However, different treatment options were sought and tried. Non-pharmacological approaches included were comforting and local massage therapy (Uziel & Hashkes, 2007), muscle stretching (Evans, 2008), warmth modalities (Lowe & Hashkes, 2008) or simply no management with general improvement over time (Uziel, Chapnick, Jaber, Nemet, & Hashkes, 2010). Pharmacological approaches typically include analgesics such as paracetamol, chronic medication and various types of over-the-counter medication (Evans, 2008; Evans et al., 2006; Lowe & Hashkes, 2008; Uziel & Hashkes, 2007).

Joint manipulation has pain inhibitory effects that could relieve GP regardless of the cause, although this effect would be considered more management than curative of the problem. Mechanisms such as gate control whereby the stimulation of large diameter nerve fibres from normal tactile stimulation inhibit the pain felt from the smaller diameter nerve fibres that conduct pain could play a role in pain relief (Mendell, 2014). This mechanism would, however, also be activated with other physical therapies such as massage (Kessler, Marchant, & Johnson, 2006). Manipulation also activates the descending pain inhibitory system from the dorsal periaqueductal (dPAG) gray (Skyba, Radhakrishnan, Rohlwing, Wright, & Sluka, 2003; Sluka, Skyba, Radhakrishnan, Leeper, & Wright, 2006). Wright (1995) demonstrated the effect of manipulation on this system by noting the specific responses of dPAG activation, most markedly being rapid analgesia. An increase in substance P, which has a potent analgesic effect, has also been shown to occur with joint manipulation (Molina-Ortega et al., 2014).

Despite the possible effects joint manipulation could have on GP, there is limited evidence on the efficacy of chiropractic manipulation as a treatment intervention. A few case studies have been published (Alcantara & Davis, 2011; Fysh, 1992) which have reported favourable responses.

1.5. Aim of the study

This study aimed to assess the effect of chiropractic manipulation of lumbosacral joints found to be restricted during