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Is There an
Effective Treatment
for Reduction of

“GROWING Pains” in Preadolescents?

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Clinical scenario

A 6-year-old girl’s parents came to ask for advice following several months of interrupted sleep with their daughter waking with pain in her anterior legs a few times a week. The father had similar pains as a child and remembered them as “growing pains.” All they could do to help was to reassure her that all was well and to rub her shins to help her feel better. They struggled to find any information on the best treatment for her problem and her medical doctor could not help. They therefore sought advice from other health care professionals.

The question is — *Is there an effective treatment for reduction in growing pains in preadolescents?*

Introduction

“Growing pains” (GrP) is a condition most healthcare professionals have heard of but few have a good understanding of, with even less knowledge about the best treatments available. It is one of the most common pediatric

musculoskeletal problems seen in practice with 3-12 year olds the most commonly affected.^{11,13,16} Prevalence in society is reported between 2.6 - 49.4%^{1,3-4,6,8-12,16} and they can persist into adolescence, with some suggested links to restless legs syndrome in adults.¹⁵ Both the patient's and parents' quality of life are affected when these leg pains are frequent.⁸ It is therefore somewhat bemusing that so little is known about this condition.

or night, no sign of inflammation or other conditions on physical or laboratory examination.^{6-8,11} Many authors advocate the cessation of "growing pains" as a term in preference of "recurrent limb pain in children" as there has been little research that has shown that growing mediates this pain.^{1-2,10} The only current evidence suggestive of a link with growth found that the long bones in lambs had about 90%

Search and Keywords

A search of Pubmed, Mantis, ICL, OVID and PEDro was performed to find all relevant papers, in English or French, using "growing pain"¹² ± treatment, p(a)ediatric leg/limb pain ± treatment (n=365). Papers were rejected if they were not concerned with preadolescent limb pain or made little or no reference to treatment

Table 1: Overview of the currently researched treatments for Growing Pains

Study	Design	Size (n)	Population	Intervention	Control	Duration	Intervention Outcome	Control Outcome
Baxter & Dulberg 1988 ⁴	Randomized Control Trial	34	5-14 years with growing pains	Muscle Stretching program to Quadriceps, Calf and Hamstrings	Reassurance to children with the use of aspirin as required	18 Months	Mean 1.2 episodes per month at 3 months with 0 by 9 months	Mean 2 episodes per month at 18 months
Evans 2003 ⁶	Single-Case Experiment	8	3-10 years with growing pains and pronated feet	Use of Tri-planar wedges in 3-5 years of age and moulded orthotics in 6-10 years of age		c.9 weeks	Overall decrease in severity and frequency when using devices. Some with complete resolution	

"Growing pains" has been used to describe various pediatric pains since its first noted use by Duchamp in 1823 and has been the subject to debate ever since. There is still no agreed upon etiology, nor a universally agreed definition,^{2,4,6-12,15} though there are many view points. There are three widely recognised theories, namely fatigue (*muscle over-use injury in active children*), anatomical (*orthopedic discrepancies such as pes-cavus, or genu varum/valgus*) and psychological (*part of a wider pain syndrome or psychologically mediated*).^{2,4,8,9,11} The definition of "growing pains" is also debated with the most widely accepted definition originally proposed by Peterson in 1977, though with subsequent revision. The basic criteria are: bilateral lower extremity pain (up to three days duration) with pain free periods, starts in the late afternoon

of growth occurring when recumbent with little when weight bearing. They postulated that the same would be true of children.^{8,14,17} Research by Kaspiris et al (2007)¹¹ found that children who had been breastfed had a lower incidence of GrP (29.8%), and that this dropped further (16.2%) when breastfed for over 40 days, compared to 32.5% incidence in formula fed infants.¹¹ This needs further investigation but may suggest a protective mechanism in breastfeeding, though it may also be attributed to familial differences with those likely to breastfeed.

Al-Khattat & Campbell (2000) drew on the 1951 work of Naish & Apley to identify three groupings of symptoms in GrP. These three groups have helped to give some credibility to growing pains as a condition though they are not relevant in this discussion.

of the condition. Links/references from any of these documents not coming from the original search were also followed up and included where relevant (n=17).

Report

This report focuses on the suggested treatments given for GrP and looks at their efficacy. It focuses on the two main studies undertaken, Baxter & Dulberg (1988-4) on muscle stretching and Evans (2003)⁶ on foot posture (Table 1). There is a hole in the research that needs to be filled as these are the only two studies specifically looking at treatment.^{2,4,6-9,11, 15-16} Both these papers look mainly at the anatomical theory, but also include some measure of fatigue.

Muscle Stretching

Baxter & Dulberg (1988)⁴ performed a small RCT on 34 patients (ages 5-14) comparing a muscle stretching regime (n=18) against reassurance and aspirin as required (n=16). Aspirin has since been shown as potentially dangerous to children and so many authors advocate paracetamol or NSAIDs as alternatives.^{8,10,12,16} The muscle stretches were passive on the quadriceps, calf and hamstrings and were done twice daily for 10 minutes. The results showed a decrease in episodes of pain per month to a 1.2 mean by 3 months, and to zero by 9 months in the stretching group, with a slower decrease in the observation group, averaging 2 episodes at 18 months.

There are some major flaws/potential biases in that the author examined and followed up all cases personally, and was also not blinded to the treatment group. Patients in the muscle stretching group had more parental contact than those in the control, and numbers in the study were comparatively low, so any data errors are magnified. They concluded that a muscle stretching regime was an effective treatment for growing pains. They also noted that further research would be undertaken, though this appears to be unpublished. That said, the results are compelling and the study is still held as one of the only pieces of evidence for the use of manual therapies. This is surprising as Brown suggested in 1910 that sacroiliac strains may be responsible for GrP, but there has never been a published study to test this.²

Foot Posture

Evans wrote four articles in 2003-2007⁶⁻⁹ on GrP. The 2007⁹ study built on the findings of 2003.⁶ Initially

she undertook eight single — case experiments (ages 3-10) to look at how foot posture and the inclusion of in-shoe orthotics or tri-plane wedges could reduce or eliminate aching legs for children with pronated feet. The patient's feet were observed by the examiner with subjective corrective measures taken. To test the efficacy of these devices, she adopted a treatment withdrawal phase to ascertain if the GrP returned. In children 3-5 years she chose tri-plane wedges and the 7-10 group had orthoses. They were assessed, intervention applied, intervention withdrawn and re-applied in 2-3 week cycles. She found that in all cases the frequency and intensity of pain was reduced with the intervention applied. One child with orthoses found no return to pain even after removal of the intervention.

This study also has limitations. The method she used for evaluating foot posture, whilst regarded as the best currently available, is subject to great variance, especially in young children (also found in the follow-up study in 2007⁹). The subject sample was also very small and patients were all from a single clinic/examiner, allowing examiner bias. The long term effects are also not known.

Latterly the only statistical difference in foot position with and without GrP was the measure of navicular height on the left, though this was weakly related to GrP. The differences in navicular height were only 1.33 mm (mean), and they note that it is unreasonable to claim this as clinically relevant as differences of less than 5mm are very hard to detect, especially in this population. They therefore concluded that foot posture was not a good determinant for the presence of growing pains.⁹

Clinical Bottom Line

Good quality, large scale research into growing pains treatment is not available. The research that is available suggests that muscle stretching is an appropriate treatment for some patients and also that orthotics/tri-planar wedges is appropriate for others. As there are several forms of growing pains that people consider, it is a clinical judgment on whether a given treatment is appropriate for their patient. Rajaram *et al* (2004)¹⁵ also suggest that it is important to screen children with GrP for restless legs syndrome (RLS), especially if one parent has RLS as it is dominant gene. Almost all authors on growing pains note that serious underlying pathology is unlikely if a child presents with growing pains,¹⁰ though it is important to screen for any red-flag conditions. One of the responses to the BMJ editorial on GrP suggests that treatment to the spinal musculature can also have a good outcome.¹⁰

Re-assurance that the condition is not life threatening and using muscle stretches with low level pain control appears to be the best treatment currently available. Correction of any foot deformity with orthotics is also implicated where appropriate.

Conclusions

The evidence so far suggests that there may be a role for manual therapy in the treatment of growing pains, though this needs to be investigated more rigorously. The current level of studies does not give health professionals a toolbox from which to work. Evans *et al*⁸ found that most parents took matters in their own hands and self treated with rubbing the legs and paracetamol, with only 40% of people in that study having attempted to consult a health professional. The health

profession needs to begin to produce case reports and trials on effective treatments for GrP so that others can benefit from their clinical experiences.

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