

Spinal manual therapy in infants, children and adolescents: a systematic review towards therapeutic indication, hypothesized dysfunction and treatment outcome

F. Driehuis¹, T.J. Hoogeboom¹, J.B. Staal^{1,2}, R.A. de Bie³, M.W.G. Nijhuis-van der Sanden¹

¹ Radboud university medical center, Radboud Institute for Health Sciences, IQ healthcare, Nijmegen, the Netherlands; ² HAN University of Applied Sciences, Faculty of Health and Social Science, Nijmegen, the Netherlands
³ Maastricht University, Department of Epidemiology, Caphri research school, Maastricht, the Netherlands.

Femke.Driehuis@radboudumc.nl



Introduction

- Manual therapy is performed in children with **various ages**, with different **complaints**, and by professionals with different **therapeutic approaches**¹
- There are questions towards **safety**^{2,3}

Objective

To summarize the evidence of **spinal manual therapy (SMT)** in infants (<1 yr), children (1-12 yrs) and adolescents (12-18 yrs) in terms of **therapeutic indication, hypothesized dysfunction and treatment outcomes**.

Methods

- Databases** (Pubmed, Index to Chiropractic Literature, Embase, Cinahl, Cochrane Library) were searched up to February 2017.
- Studies were **screened on title/abstract**: SMT had to be the primary intervention in children (0-18 yrs), published in English, Dutch or German.
- Distinction between study designs: describing **effectiveness** of SMT (controlled studies) and describing **harms** (observational/descriptive studies, case reports, secondary outcome of controlled studies)
- Quality assessment was performed (**risk of bias, GRADE**)
- Meta-analysis was performed when appropriate

Results



Risk of bias: Moderate-to-high risk of bias
GRADE: very low-to-low quality of evidence

Effectiveness (n=12)

Complaints (indications)	<u>Infants:</u> colic (n=4), torticollis <u>Children/adolescents:</u> nocturnal enuresis, asthma (n=2), autism, headache, idiopathic scoliosis, grip strength improvement
Hypothesized dysfunction	Spinal joint dysfunction (n=6) Cervical joint dysfunction (n=2) Nerve innervation (n=1) Not described (n=3)
Treatment techniques	<u>Infants:</u> low-force, gentle mobilizations <u>Children/adolescents:</u> HVLA manipulations
Outcomes	SMT is not more effective than no, sham or other comparative treatment in reducing related complaints to colic and torticollis in infants, and nocturnal enuresis, asthma, autism, headache and scoliosis in children/adolescents. SMT can improve grip strength in judo athletes.

Harms

(n=13 + n=4 as secondary outcome)

		Treatment technique
Mild/moderate harms	Reported in 8 studies: soreness, stiffness, dizziness, mild neck pain, mild back pain, headache.	HVLA manipulation, specifically of the cervical spine
Adverse events	Reported in 4 case reports: - muscle weakness (6 yr) - quadriplegia (4 mo.; tumor) - death (n=2) (3 mo.)	HVLA, with extension and/or rotational elements Uncertainty about underlying cause of death.

Discussion

Although authors expect underlying biomechanical dysfunction, almost all studies do not assess functional outcomes, such as Mobility, and do not take natural course of conditions into account. HVLA manipulations in infants could induce adverse events, low-force mobilizations result in mild harms. MTs should always screen for risk factors and potential underlying pathology.

Take home messages

- Very low quality evidence suggests no effect of SMT in infants, children and adolescents compared to no, sham or other treatment**
- SMT consisting of HVLA manipulations could result in transient harms and adverse events**

¹ Gleberzon et al. The use of spinal manipulative therapy for pediatric health conditions: a systematic review of the literature. *J Can Chiropr Assoc*, 2012; 56(2):128-141.
² Humphreys et al. Possible adverse events in children treated by manual therapy: a review. *Chiropr Osteopat*, 2010, 18, 12.
³ Vohra et al. Adverse events associated with pediatric spinal manipulation: a systematic review. *Pediatrics*, 2007; 119(1), 275-283.

Funded by:



Institute for Health Sciences
Radboudumc