Craniosacral Rhythm—where does it stand?

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Introduction

In an article titled "Challenging Myths in Physical Therapy" (Harris 2001), this professor at the University of Vancouver, criticized physical therapists that were using craniosacral therapy in their treatment of musculoskeletal problems, despite the current lack of scientific evidence. Today – about ten years later – the body of evidence has not changed in favor of craniosacral therapy. Nevertheless, the demand for and offer of training courses in this area continues unabated. The following article represents a critical personal review of this myth.

This is a modified and translated version of an article published in the German journal “Manuelle Therapie” in December 2007. At that time the article caused overwhelming reactions of German-speaking physiotherapists, but unfortunately only from the opponents of Craniosacral Therapy (CST) who sent their comments. The pilots of magic carpets remained quite silent. Now in 2011: checking the amazing number of CST courses that are still offered in Germany and elsewhere, and comparing that with the ongoing absence of any evidence or at least common sense on the topic, it was considered worth translating the article into English for the IJMDT. Maybe this won’t change anything, but some of the readers will hopefully enjoy. In this context, a quote from Professor Chris Main (having dinner with us in Fellbach 2010) comes to my mind: “Stupidity of the patient is not an evidence base”. It might be added: “Stupidity of the therapist is not one either”.

Historically

More than 100 years ago, so-called 'experts' declared that the craniosacral rhythm exists. It is said that an American, William Garner Sutherland, had a spontaneous inspiration in the year 1899. He was watching a fragmented skull in a cabinet and concluded that the sutures of the skull must exist to allow the skull bones movements concerning a “primary respiratory mechanism”. His book "The Cranial Bowl" was published in 1939. John Upledger dominated the craniosacral concept in the last 25 years, after his publication of "Craniosacral Therapy" (Upledger 1983). Thirty years ago Upledger reported a high intertester reliability for the evaluation of craniosacral movements when he assessed 25 children between three and five years of age (Upledger 1977).

Assumptions

Advocates of the CST concept formulated, among others, the following concepts:

- The cerebrospinal fluid is pulsing in a certain rhythm (6-12 times per minute),
- Which rhythm exists absolutely independently of breathing or the heartbeat,
- Specially trained experts are able to palpate this rhythm,
- It is possible to diagnose illnesses according with the identification of disturbances in this rhythm,
- The skull bones can be displaced against each other, which can cause pathology,
- Therapists can treat these disturbances, which are diagnosed by palpation of these displacements of the sutures of the skull.

Facts

During aging, not all sutures of the skull calcify and a part of the skull plates can be displaced against each other (Kokich 1976). A minimal mobility at the sutures of the skull is commonly accepted today (Oleski et al 2002). MRI scans show that the brain and the cerebrospinal fluid of healthy individuals are performing some cyclic movements (Maier et al 1994).

Illusions

Active mobility of the skull bones

According to current scientific evidence, the mobility of the skull is purely a passive one. Whether changes in intracranial pressure cause movements of the skull bones between each other have been studied only once (Heifetz and Weiss 1981). To receive measurable results, the researchers had to apply such high pressures that these experiments could only have been done on two patients with apallic syndrome in the final stages (Heifetz and Weiss 1981). So, to date, nobody has been able to prove that active movements of the skull bones really exist.

Manual mobilisation of skull bones

A recently published study on anesthetized rabbits that had micro plates affixed at their skull was very revealing (Downey et al 2006). The study showed that the therapeutic pressure recommended by Upledger (Upledger 1977, Upledger 1983) neither caused any movements of the skull bones nor changed the intracranial pressure. Distraction forces of 5 – 20 grams were applied to the rabbits, as recommended by craniosacral osteopaths. In one rabbit, Downey et al applied forces between 100 grams and 10 kilograms. Only when using more than 500 grams, could the researchers achieve movements of 0.30mm between the skull bones. Changes of intracranial pressure were only achieved when they used forces that were more than 100 times greater than those used in therapy (Downey et al 2006).

Palpatory skills

Von Heymann and Kohrs (2003) published a comprehensive article on craniosacral rhythm in context of biomechanics and neurophysiology. They stated that instrumental measurements nowadays were so exact, that an active mobility of the skull can be tested as low as 0.003 mm and can be excluded above this measurement. Considering human physiology (muscle spindles, receptors), movements and changes in positions can be perceived only when these are bigger than 0.07 mm. So the threshold of perception is 20 – 30 times greater than the reading at which an

active mobility of the skull can be definitely excluded (Von Heymann and Kohrs 2003).This means concretely: even if the skull bones can move against each other, clinicians would not be able to palpate this movement.

Existence of independent movements of cerebrospinal fluid

Movements of cerebrospinal fluid, measured by imaging procedures, are in their rhythm dependent on the current heartbeat. Increasing intraabdominal pressure using the Valsalva manoeuvre or coughing affects this rhythm only temporarily (Maier et al 1994). Von Heymann and Kohrs (2003) pointed out that no system exists which can be responsible for this supposed rhythm. Anatomically neither a pump analogous to the heart muscle exists nor has a reasonable autonomous center analogous to the sinus node or the respiratory center been identified in the neural structures. Proper motions of brain substance, independent from the vascular system, are anatomically not possible (Heymann 2003). Thus, to date, no scientifically approved study indicates the real existence of an autonomous craniosacral rhythm (Green et al 1999).

Inter-tester reliability

Clinical phenomena do not necessarily depend on proof from technical equipment. The fact that something is not measurable by current capabilities of research does not mean that it does not actually exist at all. On the contrary, it can be the strength of such a clinical phenomenon to replace a mechanical device or be shown potentially to be superior to that equipment. However, it is absolutely essential that a clinical phenomenon can at least be identified by different examiners with reasonable reliability, especially when the entire philosophy of diagnosis and treatment is based on that phenomenon.

All past research into the reliability of CST diagnosis has shown lack of agreement. When two therapists palpated the same person, researchers never found a significant consistency concerning the recognized rhythm (Rogers et al 1998, Wirth-Patullo and Hayes 1994, Norton 1996, Hartmann and Norton 2002). Examiners in one study were very experienced therapists; one had used CST for 17 years, and the other reported that she had treated 90% of her patients in the previous three years exclusively with CST (Rogers et al 1998). So they were two real experts! In the conclusion, they wrote "The finding that one examiner could palpate a craniosacral rate of zero while the other examiner could simultaneously palpate a consistent craniosacral rate within the same subject suggests that the examiners were measuring different phenomena, and one possibility is that they were attempting to measure something that does not exist" (Rogers et al 1998).

Hartmann and Norton (2002) described it even more concisely, "The only alternative we can imagine is that the rhythm is a result of perception of psychological phenomena inside the examiner himself". No one has been able to replicate the results of Upledger's reliability study (Upledger 1977) over the last 30 years. A common point of criticism of his study is that all 25 evaluated children showed a disturbance in the craniosacral rhythm.

Pathology

Research could not prove a causal relationship between various positions of the skull bones and changes in movements of cerebrospinal fluid yet. The assumption that a disturbance in this area can cause any health problems lacks any supportive evidence and any plausible explanation (Green et al 1999).

Bottom line

No scientific evidence favors the existence of an autonomous craniosacral rhythm in terms of independent movements of brain and cerebrospinal fluid. More than that, the body of evidence seems to eliminate any possibility of this phenomenon. Each clinician, searching for alternative therapies, must decide by himself, how consequently he will ignore the pure facts. CST does not fulfill the rudimentary minimum requirements for any diagnostic and therapeutic concept. Intertester reliability is zero and to date, serious studies on effectiveness simply don't exist.

Conclusions

Alternative methods of diagnosis and therapy usually claim that they cannot be assessed by the standard measuring tools of evidence based medicine. No doubt, some things are happening between heaven and earth that cannot be assessed by the wooden yardstick of our mind. But therapists should remain sceptical. The ones who believe the tenets of the craniosacral community in their daily work are at risk of moving away from serious health profession behaviour to the magic kingdom of assumptions and wishful thinking. It's not damnable that patients might feel better after craniosacral intervention, due to placebo response from a convincing therapist. But some doubts may be allowed, when the "feel better" never evolves to a "get better". If active treatment strategies remain kept back due to doubtful diagnostic models, the patient loses the possibility to work actively and self-reliantly on his wellbeing. At this point the "diplomatic immunity" of every alternative method expires.

References

Dodes JE (1997). The mysterious placebo [quote from: Dubious dentistry: A dental continuing education course. Jarvis WT. Loma Linda, CA: Loma Linda University; 1990]. Skeptical Inquirer 21: 44 - 45.

Downey PA, Barbano T, Kapur-Wadwa H, Sciote JJ, Siegel M, Mooney MP (2006). Craniosacral therapy:

the effects of cranial manipulation on intracranial pressure and cranial bone movement. Orthop Sports Phys Ther. 2006 36: 845 – 853.

Green C, Martin CW, Bassett K, Kazanjian A (1999). A Systematic Review and Appraisal of the Scientific Evidence on Craniosacral Therapy. Complementary Therapies in Medicine 7: 201-7.

Greenman PE, McPartland JM (1995). Cranial findings and iatrogenesis from craniosacral manipulation in patients with traumatic brain syndrome. J Am Osteopath Assoc 95: 182 -188.

Harris R (2001). Challenging Myths in Physical Therapy. Physical Therapy 81: 1180 - 1182.

Hartmann SE, Norton JM (2002). Interexaminer Reliability and Cranial Osteopathy. The Scientific Review of Alternative Medicine 6: 23 -34.

Heifetz MD, Weiss M (1981). Detection of skull expansion by increased intracranial pressure. Neurosurgery 33: 811 – 812.

Kokich VG (1976). Age changes in the human frontozygomatic suture from 20 to 95 years. Am J Orthod 69: 411 – 430.

Maier SE, Hardy CJ, Jolesz FA (1994). Brain and cerebrospinal fluid motion: real-time quantification with M-mode MR imaging. Radiology 193: 477- 483.

Norton JM (1996). A challenge to the concept of craniosacral interaction. Am Acad Osteopath 6: 15 - 21.

Oleski SL, Smith GH, Crow WT (2002). Radiographic evidence of cranial bone mobility. Cranio 20: 34 – 38.

Rogers JS, PL Witt, MT Gross, JD Hacke and PA Genova (1998). Simultaneous palpation of the craniosacral rate at the head and feet: intrarater and interrater reliabilty and rate comparisons. Phys Ther 78: 1175 - 1185.

Upledger JE (1977). The reproducibility of craniosacral examination findings: a statistical analysis. J Am Osteopath Assoc 76: 890 – 899 Upledger JE (1983).Craniosacral therapy, Eastland Press, Chicago.

Von Heymann W, Kohrs C (2003). Was ist der ”kraniosakrale Rhythmus”? Ein Beitrag zum Umgang mit der „kraniosakralen Osteopathie“ (CSO). Manuelle Medizin 44: 177-184.

Wirth-Pattullo V, Hayes KW (1994). Interrater reliability of craniosacral rate measurements and their relationship with subjects' and examiners' heart and respiratory rate measurements. Phys Ther. 74: 909-920.

Palpating the craniosacral rhythm

"...for both patient and practitioner to be blind to the clinical realities is an unacceptable version of the 'double-blind.'" (Dodes 1997).