

Diagnostics and treatment of infants suspected with kinematic imbalance due to suboccipital strain (KISS)

This is an excerpt from the full technical report, which is written in Norwegian.

The excerpt provides the report's main messages in English.

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Magne Nylenna, *acting Director*
Authors Brurberg, Kjetil G, *Project leader, Researcher*
Myrhaug, Hilde T, *Senior Advisor*
Reinar, Liv Merete, *Research manager*

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Norwegian Knowledge Centre for the Health Services
Oslo, June 2009

Key messages

Diagnostics and treatment of infant suspected with kinematic imbalance due to suboccipital strain (KISS)

KISS is an acronym for Kinematic Imbalance due to Suboccipital Strain, and a term being used to describe a possible causal relation between imbalance in the upper neck joints in infants and symptoms like postural asymmetry, development of asymmetric motion patterns, hip problems, sleeping and eating disorders. Several academic disciplines (e.g. manual therapist, chiropractors and osteopaths) are currently offering treatment to infants suspected to have KISS, a treatment typically consisting of spinal manipulation of the upper neck joints, relaxing- and mobilisation exercises. Treatment is often followed up by paediatric physiotherapists who stimulate development of a symmetric motion patterns and build muscular strength.

To make this report, several databases have been systematically searched to reveal research literature evaluating the effectiveness of different techniques used to treat infants with KISS. Databases were also searched for evidence of adverse effects and studies examining the accuracy (validity) of various diagnostic tests.

At the present there is no gold standard or standardized ways to diagnose infants suspected for KISS, but some commenced projects may provide valuable results in the future.

We identified one randomized controlled trial showing that osteopathy can potentially reduce the degree of postural asymmetry among infants, but the study did not reveal any changes in vegetative parameters following treatment. It has to be emphasized that these conclusions are based solely on one small study, suggesting that the strength of the evidence is too low to make reliable conclusions about treatment effects.

We did not find evidence suggesting that the use of manual therapeutic, osteopathic or chiropractic treatment strategies in infants is associated with risk of injuries or harmful side effects, but the level of evidence is very low.

Executive summary

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BACKGROUND

Postural asymmetry and development of asymmetric motion patterns can be frequently observed in infants. There are many possible causes, for example infections, ocular pathology and skeleton anomalies, but traditionally infantile postural asymmetries have been ascribed to injuries or dysfunction in musculus sternocleidomastoideus.

During the last decades it has been asked whether the focus muscular dysfunction as a causative factor for torticollis is correct. Some specialists are now focusing on upper cervical columna imbalances as a potential causes to postural asymmetry, and they are offering treatment strategies consisting of manipulation and mobilisation techniques.

In the 1990ies Heiner Biedermann introduced “KISS”, an acronym for Kinematic Imbalance due to Suboccipital Strain as a new term to describe postural asymmetry caused by imbalances in cervical columna. However, Biedermann also went one step further and hypothesized a relationship between suboccipital imbalances and various regulation mechanisms, and as a result of this, suboccipital imbalances are not only used to explain postural asymmetry, but also colic like symptoms, belching, sleep disruptions, feeding problems, dribbling etc.

The coupling between suboccipital imbalances, postural asymmetry and various vegetative parameters is debated, leading to local and regional variation in the kind of treatment offered or supported by the health services. National Knowledge-centre for Health Services has been commissioned to review relevant research literature to answer the following two questions:

- What is the accuracy and validity of diagnostic test used to diagnose infants with KISS?
- What does the evidence say about effectiveness of manipulative intervention strategies used to restore a suboccipital balance in infants, with a particular interest in studying possible adverse effects

METHOD

A research librarian developed a systematic search for relevant literature in Medline, Embase, Svemed, Amed, Pedro, ICL (Index to Chiropractic Literature) and Cochrane Library (CENTRAL and CRD). The last search was performed in February 2009.

All publications that were identified by the search were evaluated against a predefined set of inclusion and exclusion criteria. Different sets of inclusion and exclusion criteria were used depending on the topic (diagnostics, treatment effect or harm) of the publication. For example, only controlled clinical trials were included to answer questions about treatment effect, whereas all possible designs were included to answer questions about harm.

RESULTS

Our literature search did not reveal diagnostic validation studies. As it does not seem to exist common reference standards for diagnosing infants with KISS, there are no results to report on the question about the accuracy of diagnostic methods.

One randomized controlled study on the effect of osteopathy in infant with postural asymmetry was identified on the question of treatment effect. The study was of German origin, and included 32 infants. For participants in the control group (sham-therapy), the symmetry score improved from 14.2 (SD 2.0) to 13 (SD 2.8) points. For participants in the osteopathy group the symmetry score improved from 15.4 (SD 2.7) to 9.5 (SD 3.1) points. Consequently, infants in the intervention group experienced an improvement that was 4.7 points higher than infants in the control group (95 % confidence interval from 2.0 to 7.6 points and $p=0.001$). No statistically significant changes in vegetative parameters were observed between intervention and control groups.

Two publications were considered relevant for inclusion on the question on adverse effects of mobilisation or manipulation of the upper cervical column of infants. Another infant died following a session of Vojta-therapy. The therapy caused bleeding from the vertebral arteries, but the technique was rough and probably not applied in accordance with standard practice. In a large patient series it was reported about mild bradycardia following manual therapeutic KISS-treatment. The effect on heart rate was short-lived (3 to 25 seconds), and can hardly be defined as pathological.

DISCUSSION

Altogether, this systematic review revealed few relevant publications. The lack of research can partly reflect challenges related to planning and initiation of research project, but can also be attributed to the fact that the KISS-theory and –practise has a rather short history.

We did not reveal publications suggesting that manual therapeutic, chiropractic or osteopathic intervention used to treat infant with postural asymmetry or KISS can be associated with adverse effect. Due to the limited number of identified studies, however, the quality level of the evidence is considered very low. Three infants experienced complications following chiropractic manipulations of the cervical column, but further examinations showed that the infants suffered from cervical tumours. Thus, it can be argued that the complications were caused by inadequate diagnostic procedures and incorrect treatment, but illustrate the importance of high quality differential diagnostic routines.

The use of the KISS-terminology and the focus on suboccipital strain in infants is debated. Thus, data from randomised controlled trials are highly needed, and probably the only the strategy able to answer questions about treatment effects convincingly. In this context, development of objective and uniform diagnostic test methods is essential to know when it is desirable to initiate treatment.

CONCLUSIONS

- We were not able to identify a reference standard for diagnosing infants being suspected of having KISS, but relevant research projects seem to be in the pipeline.
- One study suggests that osteopathic treatment may possibly reduce the degree of postural asymmetry in infants in the short term, but vegetative parameters are not seemingly affected by the treatment. However, the strength of the evidence is too low to make reliable conclusions about treatment effects
- We were not able to identify controlled studies examining the effect of manual therapeutic or chiropractic techniques used to treat infants suspected with KISS or postural asymmetry.
- We were not able to identify adverse effects following the use of manipulative techniques in infants suspected with KISS or postural asymmetry. Due to a lack of relevant research however, the level of evidence is considered very low.

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Norwegian Knowledge Centre for the Health Services
PB 7004 St. Olavs plass
N-0130 Oslo, Norway
Telephone: +47 23 25 50 00
E-mail: post@kunnskapssenteret.no
Full report (pdf): www.kunnskapssenteret.no