Heart rate changes in response to mild mechanical irritation of the high cervical spinal cord region in infants

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FROM ABSTRACT:

Alterations in the heart rate were monitored before, during and after the application of a unilateral mechanical impulse to the high cervical spinal cord region which was administered strictly in connection with the so called manual therapy (diagnosis=KISS).

The investigation is based on a survey of 695 infants between the ages of 1 and 12 months.

A notable change in the heart rate was evident in 47.2% of all examined infants.

In 40.1% of these infants, the change in heart rate was characterized by heart rate decrease of 15-83% compared to control conditions.

Infants in their first 3 months of life responded more often with a severe bradycardia (50-83% decrease), older infants (7-12 months) more often with a mild bradycardia (15-49.9% decrease).

This comparison revealed a significantly increased occurrence of severe bradycardia in the younger age group compared to the group of children >3 months.

In 12.1% (n=84) of the infants, the bradycardia was accompanied by an apnea.

We discuss the hypothesis that mechanical irritation of the high-cervical region serves as a trigger that may be involved in sudden infant death (SID).

THESE AUTHORS ALSO NOTE:

“In first world countries, sudden infant death (SID) is the most common cause of death during the first 12 months of postnatal life.”

“One of the major risks is the prone position of the sleeping baby, which enhances the death rate by (odd ratio) 3.5 per thousand.”

“There is increasing evidence that SIDs-victims exhibit a pronounced bradycardia before dying.”
“This bradycardia is followed by apnea and the generation of gasping.

“Gasping, which is normally associated with an increased heart rate and arousal, fails to evoke these responses in SIDs-victims.

“As a consequence, these children seem to die because gasping does not lead to a successful recovery”

“In this investigation we examined whether a mechanical irritation of the atlanto-occipital region can cause a bradycardia, which may lead to the initial phase of SID.

“A mechanical stimulation of the atlanto-occipital region is always administered in connection with manual therapy and could, therefore, provide insights into possible age-dependent changes in autonomic responses.”

The atlanto-occipital region controls:
1. crawling
2. moving of the baby during the night
3. vagal autonomic nerve function
4. phrenic nerve function
5. vertebral artery blood flow

Problems at the atlanto-occipital region could lead to bradycardia and apnea.

“A pronounced sensitivity of the atlanto-occipital region was first noticed during routine chiropractic treatment of 6000 infants that were diagnosed with ‘kinematic imbalance due to suboccipital strain’ (KISS).”

“This therapy included an impulse [adjustment] applied to the atlanto-occipital region which was often associated with vegetative responses.

These authors evaluated the impulse-induced [adjustment] changes in the heart rate, the occurrence of flush and apnea in a group of children ranging from 1 to 12 months of age, the period in which SIDs occurs.”

This “study involved only infants that were diagnosed with orthopedic abnormalities, in particular asymmetries in the horizontal and sagittal plane of body posture and motion.” [Postural and segmental subluxation complexes]

These infants displayed “asymmetries in the horizontal and sagittal planes.”

“CHIROPRACTIC THERAPY IN INFANTS ANDS CHILDREN”

“All infants showed some kind of deficits in neuromuscular steering as well as asymmetry such as wryneck and c-scoliosis.”
Asymmetry in the atlanto-occipital-C2 region was determined by x-rays.

“The infants examined also showed pathological neuromuscular development.”

“The therapeutic impulse [adjustment] used to treat KISS consisted of a short, gentle thrust administered onto the suboccipital region with the inner side of the interphalangeal portion of the second digit.”

“Although the force of the thrust was not measured in every case, representative impulses were measured and were ranged from 30 to 70 N, being in the order of 50 N and never exceeding these values.”

“For the chiropractic therapy the infants were positioned on their back while the chiropractor was sitting perpendicular to the child's head. Great care was taken that the infant was comfortable before the impulse was administered. The child's body was relaxed and any rotation of the spine was avoided. The impulse was applied to the side of the asymmetry.”

“For this study the impulse-induced changes in heart rate, blood pressure, frequency of breathing, oxygen saturation and the peripheral temperature were measured.”

Mild bradycardia was defined as a decrease ranging from 15 to 49.9% and severe bradycardia from a decrease of 50.0% or greater.

The authors also observed the presence of flush and apnea.

“Usually the flush occurred almost instantaneously following the mechanical impulse.”

“Apnea (respiratory arrest) usually occurred with a delay of several seconds following the irritation of the high cervical region.”

RESULTS

“The increased number of younger children in our study suggests that these children suffered more severely from asymmetry-related symptoms.” [WOW]

“An increased heart rate of >15% occurred in only 7.3% of the children, whereas 40.1% of the children showed a heart rate decrease of >15%.

[Indicating sympathetic inhibition]

Bradycardia [Indicating sympathetic inhibition] was associated with flush [Indicating sympathetic inhibition] and loss of muscle tone [Indicating sympathetic or motor neuron inhibition].

“The occurrence of a bradycardia was often accompanied by other vegetative
responses, such as apnea and flush.”

The combination of bradycardia, flush and apnea showed an age distribution similar to that of SID-victims.”

DISCUSSION

“The mechanical impulse to the suboccipital region led in a significant number of cases to a decrease in the heart rate (40.1%).” \textbf{[Indicating sympathetic inhibition]}

“How safe is chiropractic treatment for young infants?”

“The chiropractic therapy has proven to be a successful technique which can be used to treat disorders, especially cerebral disturbances of motor patterns of various etiology (wryneck, c-scoliosis, irritation of the plexus brachialis), sensomotoric disturbances of integration ability (retardation of sensation and coordination), as well as pain related entities such as cry-babies with ‘3-month colic’ or hyperactivity with sleeplessness.”

“In older children disturbances of this kind are known as retardation of development in motor patterns as well as in sensory abilities.”

“The epidemiological prevalence of such disturbances has been estimated to be as high as 16.8-17.8%.”

“Chiropractic treatment seems to be the most successful therapy which helps to treat such disorders.”

“Therefore, chiropractic treatment and manual therapy have become increasingly popular over the past decade.”

“We can report more that 20,000 children treated without serious complications.”

These authors conclude “that a mild irritation of the cervical region will more likely lead to a severe bradycardia in the first 3 months.”

“A severe bradycardia evoked in the prone position may result in a sudden death during sleep, if the child does not arouse, does not gasp or does not sense the hypoxic conditions.”

“Thus, our findings are consistent with the possibility that a minor mechanical irritation of the cervical region may trigger the first step in the events that lead to SID.”

All of the children in this study “were all taken for chiropractic treatment because of some sort of abnormality in their motor pattern (695/695).”
“A delayed maturity in motor activity should, therefore, be considered as a possible cofactor in the events that lead to SID.”

“The hypothesis that bradycardia and an apnea are induced from mechanical stimulation of the occipit-C2 region is a new one and should be considered as an important risk factor in triggering the events that may ultimately lead to SID.”

“Children with a disturbed symmetry of the atlanto-occipital region could be of higher risk for SID.”

KEY POINTS FROM DAN MURPHY

(1) Sudden infant death (SID) is the most common cause of death in the first 12 months of life in developed countries.

(2) SID may be caused by bradycardia and apnea.

(3) Bradycardia and apnea can be caused by mechanical irritations to the upper cervical spine.

(4) Mechanical irritations of the upper cervical spine present as asymmetries of posture and/or spinal motion, and can be diagnosed radiographically.

(5) Mechanical irritations of the upper cervical spine can be corrected by a chiropractic spinal adjustment.

(6) Chiropractic upper cervical adjustments inhibit the sympathetic nervous system. [IMPORTANT]

(7) Pediatric chiropractic adjustments are safe and effective for newborns, infants and older children with neuro-musculoskeletal and other problems.

(8) Minor mechanical irritation of the cervical region may be related to the events that lead to SID.

(9) Children with a disturbed symmetry of the atlanto-occipital region [chiropractic subluxation complex] could be of higher risk for SID.