Role of visual, vestibular and somatosensory systems in the neural regulation of head position and body posture in young women with idiopathic scoliosis

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The goal of this study is to establish differences and agreements in the integration of vestibular, visual and somatosensory information and in the neural regulation of head position between girls with idiopathic scoliosis, woth congenital scoliosis...

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Musculoskeletal and connective tissue deformities (incl
	intervertebral disc disorders)
Study type	Observational non invasive

Summary

ID

NL-OMON34974

Source ToetsingOnline

Brief title Body and head position of girls with idiopathic scoliosis

Condition

• Musculoskeletal and connective tissue deformities (incl intervertebral disc disorders)

Synonym

Idiopathic scoliosis

Research involving

Human

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Sponsors and support

Primary sponsor: Rijksuniversiteit Groningen Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: head position, posture, scoliosis

Outcome measures

Primary outcome

- head angle (in degrees)

- platform angle (in degrees)

Secondary outcome

Not applicable

Study description

Background summary

Idiopathic scoliosis (IS) occurs with a prevalence of 1-3 % in the population, and is the most common spinal deformity in adolescents. This type of scoliosis usually develops during the period of rapid growth as a three-dimensional deformity of both translational and rotational asymmetry. Apart from the spinal deformity, other features are posterior chest wall prominence and overall postural imbalance in the coronal plane. Morphological changes associated with IS alter the relative position of the head, the shoulders, the shoulder blades, and the pelvis in all planes. Although several possible causative factors have been suggested and examined, there is no generally accepted theory for the aetiology of idiopathic scoliosis. A systematic literature research of the aetiology of IS conducted earlier this year, has given reason to belief that integration of the three perceptual systems - visual, somatosensory and vestibular - at the brainstem level possibly plays a part in the development of IS. With this information, healthy people are able to establish the true vertical and horizontal without any problems. Even if the head or body is tilted, the person is still able to establish upright. The sensory information is redundant that orientation and balance are guided by simultaneous reafferent cues. The functional ranges of the systems overlap, thus permitting them to compensate in part for each other*s deficiencies. Therefore, when visual

information is absent, healthy people are still able to closely estimate the true vertical. They are able to make a fairly accurate estimation of verticality of their bodies. Several findings give reason to assume that patients with idiopathic scoliosis are less capable of doing so. The assumption on which this study is based, is that patients with IS have a different neural regulation of head position and body posture than healthy people do.

Study objective

The goal of this study is to establish differences and agreements in the integration of vestibular, visual and somatosensory information and in the neural regulation of head position between girls with idiopathic scoliosis, woth congenital scoliosis and healthy girls. Results should provide more information about the pathology of idiopathic scoliosis and possibly about the aetiology.

Study design

Measurements take place in the CAREN laboratory (Computer Assisted Rehabilitation Environment; a virtual reality system for research and rehabilitation of the Institute of Human Movement Sciences) of the University of Groningen. Using the laboratory*s camera system, we can track the position in space of a marker that is placed on the subject*s body in real-time. The lab has a platform which will be used to roll-tilt subjects and/or a box. The box consists of black, wooden pergolas and white Chinese paper. The backside of the box is open; this way the subject will not feel trapped and we can videotape her movements.

There are four experimental conditions:

1.Inbox: Subject is standing inside the box with her eyes open (the box and subject*s support surface are tilting along with the platform)

2.Inbox sit: subject is sitting on the table inside the box with her eyes open (the box is tilting along with the platform, but the subject*s support surface is not)

3.Outbox open: Subject is standing on the platform without the box with her eyes open (subject*s support surface is tilting along with the platform)
4.Outbox closed Subject is standing on the platform without the box with her eyes closed (subject*s support surface is tilting along with the platform)

Study burden and risks

Not applicable

Contacts

Public Rijksuniversiteit Groningen

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age

Adolescents (12-15 years) Adolescents (16-17 years) Children (2-11 years)

Inclusion criteria

Patient group:

- the subject is female
- congenital or idiopathic scoliosis
- 9-16 years of age;Control group:
- the subject is female
- 9-16 years of age

Exclusion criteria

Patient group:

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- the subject is male
- vestibular disorders
- motor disorders
- height subject is over 1.75 m.;Control group:
- the subject is male
- subject has a scoliosis
- vestibular disorders
- motor disorders
- height subject is over 1.75 m.

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Basic science

Recruitment

NL	
Recruitment status:	Recruiting
Start date (anticipated):	11-06-2010
Enrollment:	100
Туре:	Actual

Ethics review

Approved WMO	
Date:	23-04-2010
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register CCMO **ID** NL30993.042.09