

Purpose: Are AIS & CFA linked?

Patients & Method: Scoliotic group (S): 87 (62f&25m from 9 to 45); non scoliotic group (NS): 32 (30f&2m from 10 to 35). To assess a relationship between AIS & CFA we set up special investigations in both groups.

- MRI measurement of the shape of the basicranium thanks to a new neuro-intra-cranial referential.

Evaluation of POLS:

- Ocular torsion measurement: scanning laser ophthalmoscope (SLO HRA) in Red Free filter was used in a reference head position. All subjects were explored at 0° (0° = vertical gravity). Optical Coherence Tomography (OCT) was performed to evaluate the foveal anatomical normality.
- Search of anomalies of the functional labyrinths: modelling the membranous semi-circular canals. We used the software 'Anatomist' (www.brainvisa.com) and a special segmentation. The results were cross checked with the software 'Detecta' (GE).

Results: Both groups are asymmetrical but S group clearly showed posterior basicranium asymmetries associated with cerebellum asymmetries. Ocular ex-cyclotorsions are highly related to S group. We discovered significative morphological anomalies of the canals: stenosis, occlusions, lack or partial shape in S group.

Conclusion: These new findings bring to the fore that Scoliosis can be related to neurological dysfunctions themselves linked to anatomical anomalies. More, these findings open the door to genetic explorations because canals genesis are induced in cristae by, recently identified, fibroblast growth factors (fGfs) which also modulate the brain growth.

14.19 Attentional networks contributing to postural stability during dual tasks in typically developing children and children with cerebral palsy

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Introduction: Children with cerebral palsy (CP) are known to have difficulties with balance which may increase in distracting environments. It is known that attention and balance interact and that performing dual tasks can have an adverse effect on balance. Whether the difficulties experienced by children with CP are related more to limitations in balance or limitations in attentional networks is unknown. The purpose of the present study was to examine deficits of attentional networks in individuals who have CP.

Methods: Participants were children (10–15 yrs) in three categories; typically developing, ataxic cerebral palsy and diplegic cerebral palsy. Participants completed the Child Attentional Network Test (ANT) that separates attention into alerting, orienting, and executive components. Reaction time and response accuracy were the dependent variables.

Results: Overall, participants with CP required longer time than controls to initiate correct responses. Children with diplegic CP had alerting and orienting effects in the same range as controls. Interestingly, children with ataxic CP benefited less from alerting cues, and had detrimental effects from orienting cues. All children with CP had more difficulty with executive function than controls.

Discussion and Conclusion: Children with CP demonstrate limitations in their attentional networks. Because of these deficits they may have limited capacity to respond to a dual task situation. The classification of CP further influences the limitations. It may be more difficult for children with ataxic CP to maintain balance when additional visual cues are present.

14.20 Motor deficits in autism: the role of action representation

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Introduction: Autism is a neurodevelopmental pathology mainly characterized by social impairments. Signs of abnormal motor development are salient from the very first years of life. Anticipation relies on the use of internal representations that store critical information used to program in advance the motor commands. These representations are built when interacting with the environment. Within the frame of a functional approach of motricity, we looked at the development of motor anticipation in autism. We hypothesized that lower ability for communication and interaction in autism would interfere with sensori-motor representations used for action.

Methods: Different studies based on kinematics, electromyography, force recordings and brain imaging assessed the use of anticipation through a bimanual load-lifting task and an object lifting task. Children with autism aged 4–12 were compared to normally developed children.

Results: Instead of an anticipated mode of control, children with autism made use of a feedback mode of control in the bimanual load-lifting task. Varying the need to update the object's weight representation in the lifting task pointed out difficulties in the use of sensori-motor representations. Cortical activity recordings indicated a lack of reactivity in the sensori-motor areas, while whole brain imaging suggested abnormal maturation of cerebellum, superior temporal gyrus and prefrontal areas.

Discussion and conclusion: Development of action representations plays a major role in autism, where the question remains whether it is a prerequisite to the development of social and cognitive representations or if it evolves in parallel.

14.21 Postural typology of patients with atypical deglutition

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Introduction: In this paper a new nosographic entity is presented, glosso-postural syndrome, characterized by postural imbalance and atypical deglutition. The main characteristics of the two varieties, type I and type II, of glosso-postural syndrome, are described.

Methodology: More than 500 patients with a specialistic odontostomatological diagnosis of atypical deglutition have been assessed with a clinical postural evaluation and a normalized stabilometry. The age of the subjects spans between 8 and 18.

Results: The clinical and stabilometric study has allowed the identification of the main characteristics in the posture of subjects with atypical deglutition, which are described in this paper.

Discussion and Conclusion: In the light of the present study, we may state that atypical deglutition is linked not only to posture and the orocraniocervical morphology, but also to the general posture of the subject. The tongue is capable of perturbing postural balance due both to its connections with the key anatomical structures, and to other neurophysiological reasons. The hyo-glossus apparatus, by virtue of its links with the maxillaries, the skull, the cervicals, the scapulae, the pharynx and the larynx, represents the true "trait d'union" between oral functions and postural bodily functions. Due to the mainly transversal disposition of its fibers, the tongue can be considered a diaphragm that puts into communication the anterior and posterior muscular chains of the body.