

Summary

What would we like to know about

★ **Craniosynostosis, ICP and sleep disordered breathing**

This thesis was primarily designed to study ICP, sleep disordered breathing and its interaction in patients with syndromic craniosynostosis. We studied new diagnostic modalities to screen for increased ICP; we used level III sleep studies for quantitative evaluation of sleep disordered breathing and we assessed fundamental consequences of OSAS using laboratory investigations. With respect to the aims of this thesis, the following findings can be reported.

What would we like to know about diagnostic means to assess increased ICP in children with syndromic craniosynostosis.

- ★ **Ultrasound measurements of the optic nerve sheath during the day correlate with the diameters as measured on CT, but have a low sensitivity and negative predictive value for presence of papilledema.**
- ★ **Ultrasound measurements of the optic nerve sheath diameter during the night follow a similar pattern as compared to ICP as measured by invasive ICP monitoring.**
- ★ **Optical coherence tomography is a new, objective tool to indirectly assess ICP.**

What would we like to know about the natural course and consequences of OSAS in children with syndromic craniosynostosis.

- ★ **OSAS in syndromic craniosynostosis has an overall prevalence of 68%.**
- ★ **OSAS in patients with Apert, Crouzon and Pfeiffer syndrome is stable over time.**
- ★ **There is a natural improvement of OSAS in patients with Muenke or Saethre-Chotzen syndrome or complex craniosynostosis.**
- ★ **If moderate or severe OSAS is not found at the first sleep study, it is highly unlikely that it will develop over time.**
- ★ **The majority of patients has mild OSAS, which does not generally result in an increase in oxidative stress nor in inflammation during daytime.**

What would we like to know about the presence and severity of central sleep apnea in children with syndromic craniosynostosis.

- ★ **OSAS and central sleep apnea occur independently of hindbrain herniation and hence we do not advocate posterior vault surgery to improve sleep disordered breathing in patients with hindbrain herniation in the absence of other neurological symptoms.**
- ★ **Additionally, there is no central sleep apnea syndrome as a result of e.g. OSAS or white matter brain abnormalities in syndromic craniosynostosis.**
- ★ **Like in otherwise healthy children, central sleep apnea may occur at young age which improves naturally over time.**

