THESIS PROPOSAL

for the Doctoral Program at the
Medical University of Vienna

Investigation of maturational changes of visual 
evoked potentials in preterm infants below 29 weeks 
of gestation

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Summary and aim:

Recording VEPs (visual evoked potentials) is a common diagnostic investigation in adults and adolescents. VEPs are easy applicable, performed fast and are of high validity. However, in children of younger age this examination is more difficult to perform, but is also believed to be of significant diagnostic value. Advances in neonatal intensive care during the last decades have led to an increased survival rate of extremely low birth weight infants. However, neurologic and developmental disability is still common among survivors. Prevention of brain injury in these patients has become one of the main goals of modern neonatology. Evaluation of neonatal brain function may aid in the identification of risk factors and patients at increased risk for neurologic morbidity.

For infants a flash visual stimulus has to be used for VEP assessment. Additional difficulties occur when performing VEPs in newborn and preterm infants, since VEP data always has to be interpreted in relation to the state of maturation of the neuronal and visual system, which changes extremely fast in this age group. However, before embarking on larger trials using VEPs in extremely low birth weight infants, “normal” values for this age group need to be established. To date, data on reference or “normal” values for VEPs in preterm infants are still limited and no data are available for the very early maturation of the visual system in infants with gestational age less than 29 weeks. Therefore, the objective of this study was to prospectively collect data on the early visual development and to establish a basis for reference values for VEPs in the age group of preterm infants younger than 29 weeks of gestation. Measurements of flash visual evoked potentials (fVEP) on a weekly basis will be performed in the study population of premature infants from 23+0 to 28+6 weeks of gestation.

Originality and clinical relevance: This is the first study examining visual evoked potentials in preterm infants younger than 29 weeks of gestational age. With the according results and maybe in future with reference values for VEPs in this age group, a better understanding of the very early development of the visual system can be reached.