PHYSIOLOGICAL MARKERS OF SENSORIAL PROCESSING IN THE NEWBORN

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Objective: With this project, we aim to identify physiological markers (central and neurovegetative nervous system measures) of sensorial processing in one-month-old infants (auditory and visual modalities) and correlate these psychophysiological responses with a) the neurobehavioral profile; and b) developmental level and mother-baby interaction at 12 months.

Methods: A total of 61 caucasian circa one-month-old infants were assessed considering their visual and auditory ERP responses as well as their neurobehavioral profile. All infants were full-term with normal birth weight and Apgar score. The infants were recruited from Obstetric and Pediatric services of Woman’s, Children’s and Adolescent’s Department of Hospital Pedro Hispano, Portugal and the informed consent was obtained from the parents. The Ethics Committee of the hospital approved the study. To elicit the psychophysiological response (the ERPs response and the cardiac, galvanic and respiratory activity) three visual and auditory stimuli intensities were design and offered to the newborn. For the visual modality we used the Grass PS33-Plus Photic Stimulator (Astro-Med Inc.) which delivers flashes of light that directly to the newborn’s face (positioned at 50cm distance); the auditory paradigm was created in Presentation® software (Version 0.61.3, www.neurobs.com) and through speakers position at 20 cm from each newborn’s ear the sounds were offered. For the ERPs data collection we used Quick-AmpTM System connected to ActicapTM with 32 electrodes (Brain Vision Products) and for the neurovegetative nervous system data collection, we used Biopac MP-150 (BIOPAC SYSTEM®, Santa Barbara, CA, USA) coupled with ECG 100C, RSP 100C and GSR 100C modules.

Results: Preliminary results indicate that the infants produced a different psychophysiological response to the visual and auditory stimuli. Regarding the ERPs, the primary components N1, P1 and P2 were clearly present in the ERP waveform. The N1 and P1 components latency was found to be predicting a better interactive and regulatory behavior in one-month-old infants. Likewise, considering the neurovegetative analysis, the infants who presented a better vasovagal regulation to the stimuli displayed a better interactive performance.

Conclusions: In full-term and healthy infants, different psychophysiological responses to auditory and visual stimuli predict a normal and organized interactive and regulatory behavior. However, an integrated assessment of different sensorial
systems should be analyzed as they represent better behavioral marker of sensory processing.

**Publications:**


**Scientific papers in preparation:**
1) Visual Evoked-Potentials can predict better Social and Internal Regulation Behavior in One-month-old Infants
2) Physiological Markers of Neurobehavioral Profiles – Evidence from Auditory Evoked-Potentials
3) Heart Rate and Respiration Frequency - Physiological Markers of Neurobehavioral Profiles

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