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Olivier Boucher
3 rue Baribeau
G6V 6L5 Lévis/Québec
Canada
Email: olivier.boucher.1@ulaval.ca

Fetal PCB and methylmercury effects on P300 at 5 years of age

Célyne H. Bastien, Olivier Boucher* (Université Laval, Québec), Dave Saint-Amour, Marie-Sylvie Roy (Université de Montréal), Éric Dewailly, Pierre Ayotte (Université Laval, Québec),

Anne Beuter (Institut de la Cognition, Bordeaux), Annie Veilleux (Université de Montréal), Christine Després (Université du Québec à Montréal), Karine Poitras and Gina Muckle (Université Laval, Québec)

Inuit communities living in Nunavik (Northern Québec, Canada) are exposed to large quantities of polychlorinated biphenyls (PCBs) and methylmercury (MeHg) from marine food intake. A birth-cohort study was initiated within this population to evaluate the effects of perinatal exposure to contaminants on child development. Neurophysiological indices of cognitive functioning, the N1, P2 and P3 waves of event-related potentials (ERP), were measured in 5 year old children. The main hypothesis was that prenatal exposure to contaminants would be associated with increased ERP latencies, suggesting delayed cognitive processing. Altogether, 110 children (mean age = 5.4 years) from different Nunavik villages underwent neurophysiological testing. A visual Oddball paradigm was used. Latencies and amplitudes of N1 and P2 at Cz, and P3 at Pz were measured for both standard and deviant stimuli. Assessments from only 22 children were retained for preliminary statistical analyses. These preliminary analyses using Pearson correlations between exposure measures and ERP components revealed a positive relation between P3 latency and both cord PCB ($r=.394$, $p=.04$) and cord Hg ($r=.374$, $p=.05$) blood concentrations. Those results with PCBs are in accordance with previously reported results from Rotterdam cohort among 9 years old children and Yu-Cheng children aged between 7 and 12 years. P3 latency is thought to reflect processing speed and has been associated with working memory. These aspects of cognition could be specifically affected by prenatal PCB and MeHg exposure. The results from multiple regression analysis and relations with other ERP components will be presented.