



Current MITHE-SN Projects Metadata

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Relation Between Methylmercury Exposure and Serum Paraoxonase Activity in Cree and Inuit Communities of Northern Québec (Foods + Ingested Particles)

Objectives being Investigated

Methylmercury (MeHg) exposure has been linked to an increased risk of cardiovascular diseases, in particular myocardial infarction. Paraoxonase 1 (PON1) is an enzyme located in the high density lipoprotein (HDL) fraction of blood lipids. It metabolizes toxic oxidized lipids associated with both low density lipoprotein (LDL) and HDL. MeHg and various metals (Cd, Co, Cu, Fe, Mn, Ni, Zn) have been shown to inhibit PON1 activity in vitro but the relation between metal exposure and PON1 activity has not been studied in human populations. We hypothesize that mercury concentration in blood could be linked to decreased serum PON1 activity in populations highly exposed to methylmercury such as Aboriginal populations relying on fish for sustenance. PON1 activity will be determined in serum samples from participants to the Cree Health Survey who will be recruited in two Northern Quebec Cree communities to be visited in 2007. Associations between PON1 activity and metals will be tested, taking into consideration possible confounders. The influence of PON1 genotypes will be taken into consideration. In addition, we will examine possible relations between PON1 activity and the concentration of oxidized LDL, and the thickness of the carotid intima media.

Study/Sampling Design

Cross-sectional population studies implemented in Cree communities in Northern Quebec and Inuit communities in 'Nunavik'.

Number of projects providing material for study: 0

Location of Field Site(s)

--- none provided ---

Human Studies

Outcome or Process Studied

Cardiovascular diseases in relation to metal/metalloid exposure.

Exposure Medium, and Metals/Substances Quantified

Blood samples: Co, Cd, Cu, Fe, Hg, Mo, Ni, Pb, Se and Zn Toe nails: As and Se

Biological Endpoint(s) Monitored

Serum paraoxonase activity and protein level.

Biota Studied

Species

--- none provided ---

Metals, etc. Quantified

--- none provided ---

Biological Endpoint(s)

--- none provided ---

Physical Material(s) Studied

Medium/Media

--- none provided ---

Metals, etc. Quantified

--- none provided ---

Bibliographic References on-file with Secretariat: No

Data Available: No

Data Archived with MITHE-SN: No

Collaborators

Dr. Eric Dewailly (Co-Inv.) – Médecine sociale et préventive, Laval University

Metals in the Human Environment Strategic Network

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