Introduction

- Mercury (Hg) is widespread environmental contaminant, which is known to travel to the poles and accumulate as methylmercury (MeHg) in the aquatic food chain.
- MeHg exposure in the Inuit population of Nunavik is still among the highest in the world.
- Exposure to MeHg may vary according to the ecosystems where the Inuit villages are established and to the animal species available and consumed locally. Furthermore, since their availability varies over months, MeHg exposure can also vary from month to month.
- There are still knowledge gaps with respect to geographic and temporal variations in MeHg exposure in Nunavik and about local country foods responsible for MeHg exposure.
- The fetal life is a critical moment to prevent MeHg exposure in order to prevent neurodevelopmental outcomes later in childhood.
- Country foods nutritional benefits greatly contribute to healthy pregnancies and babies.

Methods

Nutaratsaliit qanungisarniqit niqituinnanut: Pregnancy wellness with country foods

- This research is part of the project Nutaratassilit qanungisarniqit niqituinnanut - Pregnancy wellness with country foods, a cross-sectional study conducted between October 2016 to March 2017.
- 97 pregnant women from the 13 Nunavik communities were recruited (Table 1).
- Inclusion criteria: to be pregnant, 16 years of age and older, considered as Inuk and currently living in Nunavik.

Results (preliminary findings for objective 1)

Table 1: Number of pregnant women eligible and recruited in Nunavik between October 2016 and March 2017

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of pregnant women eligible (estimated)</th>
<th>Number of pregnant women recruited</th>
<th>% of participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ungava region</td>
<td>55</td>
<td>22</td>
<td>40</td>
</tr>
<tr>
<td>Hudson Strait region</td>
<td>77</td>
<td>37</td>
<td>48</td>
</tr>
<tr>
<td>Hudson Bay region</td>
<td>99</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>TOTAL</td>
<td>231</td>
<td>97</td>
<td>42</td>
</tr>
</tbody>
</table>

Table 2: Blood and hair MeHg geometric mean and percentage of participants above guidelines for blood Hg

<table>
<thead>
<tr>
<th>Region</th>
<th>Blood Hg (µg/L)</th>
<th>Hair Hg (1 cm)</th>
<th>% of participants above guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hudson Bay region</td>
<td>4.28 (0.80 - 40.1)</td>
<td>1.86 (0.21 - 23.2)</td>
<td>23%</td>
</tr>
<tr>
<td>Hudson Strait region</td>
<td>4.02 (0.40 - 26.1)</td>
<td>3.77 (0.90 - 16.00)</td>
<td>25%</td>
</tr>
</tbody>
</table>

Data sources:

- Hair samples: total Hg by cm (retrospective exposure by months)
- Blood samples: total Hg (3 last months), total selenium, selenoene and hemoglobin
- Data extraction form (from medical records)
- Questionnaires:
  - Socio-demographic
  - Food frequency questionnaires
  - Traditional foods by seasons

Statistical analysis:

- Descriptive analyses were used to illustrate the distribution of blood and hair Hg data (data presented here).
- Non-parametric ANOVA (Wilcoxon each pair test) were used to examine the associations between Hg biomarkers (hair and blood) and regions.
- Analyses of variances for repeated measures will be performed to identify temporal variations in hair Hg concentrations.
- Latent Class Growth Analysis will be conducted in order to identify distinct subgroups of pregnant women following similar patterns of hair mercury variations over months.

Conclusion

- Up to 23% of participants still had blood Hg levels above the Health Canada guideline.
- Sequential hair Hg analyses show important monthly and regional variations in exposure:
  - May - August: highest MeHg exposure & higher in the Hudson Strait villages
  - Oct - March: lowest MeHg exposure in all regions
- Further analysis will be conducted:
  - to identify distinct subgroups of pregnant women following similar patterns of hair mercury variations over months
  - to identify local foods responsible for them
- Results suggest that future biomonitoring studies should consider seasonality in country foods consumption and related MeHg exposure.
- Better characterizing MeHg exposure will help developing screening tools and prevention strategies to minimize exposure to MeHg while promoting local country foods in Nunavik.

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References