

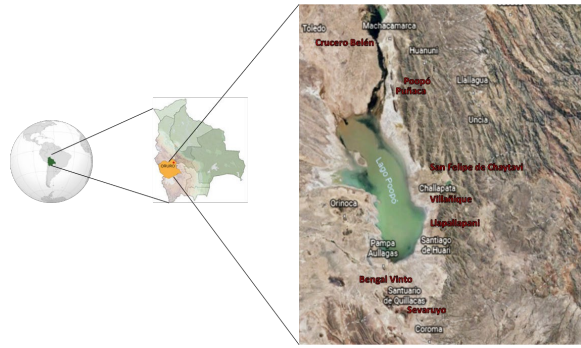
# As3MT polymorphisms and Vitamin D: effects in arsenic elimination and genotoxic damage in women of Poopó Lake - Bolivia

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The Aymara-Quechua and Uru communities around Lake Poopó in the department of Oruro-Bolivia, have human populations with chronic arsenic exposure through drinking water up to 250ug / L.

Variability in the metabolic capacity of arsenic elimination has been associated with a large number of factors, such as gender, age, exposure level, ethnicity, nutritional status, the presence of polymorphisms in the arsenite methyltransferase (AS3MT), gene related to methylation of inorganic arsenic (iAs) to its organic forms monomethylarsonic acid (MMA) and dimethylarsenic acid (DMA). This study aimed to assess the arsenic exposure in the communities around Lake Poopó, and to evaluate the influence of the polymorphisms rs11191439 and rs3740393 of the AS3MT and the status of vitamin D on the metabolism of arsenic and DNA damage. A cross-sectional study was carried out, in which a survey was applied, clinical examination, urinary arsenic metabolites were measured by HPLC-HG-ICP-MS, genotypes rs11191439 and rs3740393 of AS3MT were determined by RT-PCR, the plasma concentration of vitamin D2 / D3 was determined by ELISA and the genetic damage was evaluated by comet assay in peripheral blood lymphocytes. We included 74 women from 8 communities around Lake Poopó, whose exposure to As was measured as the sum of arsenic metabolites in urine (U-As = iAs, MMA, DMA). The metabolic efficiency was evaluated by the percentages of the fractions of As metabolites in urine. The women presented a wide range of exposure to As, U-As (median: 69.29 µg / L, range: 11.8 to 288.7 µg / L), with an efficient metabolic capacity of arsenic elimination with a high% DMA (median: 82.2%) and low% MMA (median: 6.4%). The results showed a higher frequency of the protective variants of the SNP of the AS3MT (rs11191439: T = 0.91 and rs3740393: C = 0.93) that are associated with a high methylating capacity of the As and lower % of DNA damage. On the other hand, the median level of plasma vitamin D was 19.14 ng/mL, women with a vitamin D sufficiency status have 2% less MMA, and lower% of genetic damage compared to deficit states.