

PRENATAL MANGANESE EXPOSURE AND FETAL GROWTH IN LIMÓN, COSTA RICA: DATA FROM THE INFANTS' ENVIRONMENTAL HEALTH (ISA) STUDY

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Background and aims: Mancozeb is the most widely used pesticide in banana plantations in Costa Rica. Recent studies suggest that mancozeb use potentially exposes agricultural workers and their families to manganese (approximately 21% by weight of mancozeb). Our study aims to determine whether prenatal exposure to manganese from mancozeb applications is associated with fetal growth.

Methods: The study population includes the participants of the Infants' Environmental Health (ISA) Study, a birth cohort study of 450 mother-child pairs living in communities near banana plantations with large-scale production and pesticide use in Limón, Costa Rica. To assess prenatal exposure to manganese, maternal hair and blood manganese levels were measured during the first, second, and third trimester. Determinants of exposure including residential proximity to banana plantations, household members' pesticide use patterns, and housing quality were examined. Questionnaires have been administered to the women during the first, second, and third trimester and shortly after delivery to ascertain information on sociodemographic characteristics, lifestyle habits, and occupational history. Birth outcomes are being abstracted from the newborns' Official Cards of Health. Multiple linear regression models and G-computation estimators will be used to examine the association between prenatal manganese exposure and fetal growth.

Results: We have completed enrollment of 370 mother-child pairs. Blood and hair samples have been sent for analysis and approximately 100 women have delivered. Preliminary analysis of 26 hair samples collected during the first or second trimester showed a significant difference in mean hair manganese levels between pregnant women living less than 100 meters away from a banana plantation and women living more than 100 meters away (Student t-test, $p < 0.05$). We will present the full results of the relationship between hair and blood manganese, birth weight, and gestational duration in approximately 250 children.

Conclusion: This early finding suggests that hair manganese levels could be associated with proximity to banana plantations, and consequently with mancozeb exposure. Full results of the analysis with fetal growth will be presented and discussed.