NAIL AND BLOOD LEAD LEVELS ARE RELIABLE INTERNAL DOSE BIOMARKERS TO EVALUATE OCCUPATIONAL EXPOSURE IN INFORMAL WORK JEWELRY PRODUCTION SCENARIO?

Allan Santos de Oliveira[1]; Elizeu Chiodi Pereira[1]; Henrique Yudi Furihata Nascimento[1]; Rafaela Michelan Pipolo[1]; Aline de Carvalho Elias[2]; Maciel Santos Luz[2]; Kelly Polido Kaneshiro Olympio[1]

[1] 1 Department of Environmental Health of the School of Public Health - University of São Paulo, São Paulo, SP; The Human Exposome Research Group (eXsat).

[2] Laboratório de Processos Metalúrgicos, Materiais Avançados, Instituto de Pesquisas Tecnológicas do Estado de São Paulo.

Introduction: Informal and home-based jewelry production exposes workers, such as welders, and their families to toxic and potentially toxic elements (PTEs), increasing the risk of adverse health effects. Blood lead level (BLL) is a well-established gold-standard biomarker of internal dose in epidemiological studies. Fingernail samples have gained attention in biomonitoring due to their simple, non-invasive collection and stability during transport and storage, offering a cost-effective and viable alternative matrix for biomonitoring studies. **Objectives:** To assess whether nail lead levels (NLL) are reliable internal dose biomarkers for household exposure in informal home-based jewelry production. **Methods:** Fifty families were divided into two groups: (1) Exposed, including households with at least one member involved in jewelry assembly or welding at home (n=84), which was made up workers' relatives (n=44) and workers (n=40) divided between welders (n=21) and assemblers (n=19) categories, and (2) Controls, with no involvement in jewelry production (n=53). Two sampling campaigns were conducted in a four-month interval (nail growth period). In the first, 115 nail samples (thumbs) were collected; in the second, 184. NLL comparisons between exposed and control groups, workers and workers relatives, and between welders and assemblers were made. BLL and sociodemographic data were obtained from previous studies. Mann-Whitney tests assessed differences between groups and campaigns. Spearman's correlation tested associations between BLL and NLL**. Results:** NLL values were higher in the exposed group than in controls during both campaigns (0.10 $\mu g.g^{-1}$ *versus* 0.04 $\mu g.g^{-1}$; 0.36 $\mu g.g^{-1}$ *versus* 0.26 $\mu g.g^{-1}$, respectively), but without statistical significance. The highest NLL levels were found among welders in the second campaign (0.83 $\mu g.g^{-1}$), showing a significant difference compared to assemblers (p=0.036). Moderate correlations were found between NLL and BLL in the second campaign for welders (r=0.52; p=0.037), workers (r=0.48; p=0.006), workers relatives (r=0.43; p=0.045), and the exposed group (r=0.47; p<0.001). **Conclusions:** In this occupational exposure scenario, jewelry workers, especially welders, may face greater Pb contamination. BLL and NLL correlations suggest that both biomarkers tend to vary together, particularly after nail growth period. These findings support the potential use of NLL as a biomonitoring tool for informal workers at risk of low Pb exposure.

Keywords: Informal work; Lead; Biomarkers.

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