LIVING CONDITIONS AND INFLAMMATORY PROFILE IN MINERS EXPOSED TO CRYSTALLINE SILICA

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INTRODUCTION: Mining is a high-risk occupational activity, as workers are constantly exposed to physical hazards and toxic chemical substances, such as crystalline silica and metals, contributing to the development of chronic diseases like silicosis and pulmonary fibrosis.

OBJECTIVE: To study living conditions and the inflammatory profile of miners and workers not occupationally exposed to crystalline silica.

METHODOLOGY: The study was approved by the Ethics Committee (CAAE) of the Federal University of Rio Grande do Sul (No. 53706121.6.1001.5347). Participants included miners exposed to silica (ME, N=35) and workers not occupationally exposed to crystalline silica (CG, N=13). Digital questionnaires were administered through the Questionnaires for Workers Exposed to Chemical Agents (QEAQS) app, and whole blood was collected for laboratory analyses. Through the app, it was possible to profile participants based on their lifestyle habits (smoking and alcohol consumption). The data were compared with laboratory tests (glycated hemoglobin, lipid profile), performed using commercial kits and a biochemical analyzer. In addition, the expression of adhesion molecules (CD62L, CD62P, PDL1) was analyzed in whole blood by flow cytometry and separated by gates (lymphocytes and monocytes).

RESULTS AND CONCLUSIONS: No significant differences were observed between groups (ME and CG) in routine biochemical tests, nor between smokers (N=5) and non-smokers (N=43), or in alcohol consumption. Protein expression results showed increased PDL1 expression in monocytes and lymphocytes among smokers. There were no significant differences in the expression of other adhesion molecules across any of the evaluated habits. These findings suggest a relationship between smoking and increased expression of adhesion molecules and immune-inflammatory responses, raising the risk of silicosis and other lung diseases in miners. The app made it possible to obtain relevant data from exposed workers, facilitating rapid and effective profiling of exposure and reducing potential errors in data entry, thereby contributing to the advancement of occupational and environmental toxicological research in the field.