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NOTE PREVIEW ARTICLE

IS THERE A RELATIONSHIP BETWEEN OCCUPATIONAL EXPOSURE TO AGROCHEMICALS AND HEARING CHANGES? EXISTE RELAÇÃO ENTRE EXPOSIÇÃO OCUPACIONAL A AGROTÓXICOS E ALTERAÇÕES AUDITIVAS?

EXISTE RELACIÓN ENTRE EXPOSICIÓN OCUPACIONAL A AGROTÓXICOS Y CAMBIOS AUDITIVOS?

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ABSTRACT

Objective: to analyze the relationship between exposure to pesticides and the occurrence of auditory alterations of rural workers. **Method:** quantitative, descriptive, explanatory and transversal research. It will be carried out with male rural workers exposed to pesticides, who live in the municipality of Santa Rosa, in the northwest region of RS, and who seek care in a Basic Health Unit located in the rural area. For data collection, a questionnaire will be used, hearing screening and plasma cholinesterase and erythrocyte dosage. The project respected ethical procedures and is approved by the Ethics Committee. The data will be stored in spreadsheets and analyzed using the R v.2.15.3 software. **Expected results:** it is expected to find relationships between exposure to pesticides and the occurrence of changes in the auditory system and provide subsidies for the elaboration of programs and public policies to prevent hearing loss in rural workers. **Descriptors:** Hearing; Farmers; Agrochemicals; Occupational Health.

RESUMO

Objetivo: analisar a relação exposição a agrotóxicos e ocorrência de alterações auditivas de trabalhadores rurais. **Método:** pesquisa quantitativa, descritiva, explicativa e transversal. Será realizada com trabalhadores rurais, do sexo masculino, expostos a agrotóxicos, que residem no município de Santa Rosa, região noroeste do RS, e que buscam atendimento em uma Unidade Básica de Saúde localizada na zona rural. Para a coleta de dados, serão utilizados questionário, triagem auditiva e dosagem de colinesterase plasmática e eritrocitária. O projeto respeitou os procedimentos éticos e tem aprovação por Comitê de Ética. Os dados serão armazenados em planilhas eletrônicas e analisados com o auxílio do software R v.2.15.3. **Resultados esperados:** espera-se encontrar relações entre a exposição a agrotóxicos e a ocorrência de alterações no sistema auditivo e fornecer subsídios para a elaboração de programas e políticas públicas de prevenção das perdas auditivas em trabalhadores rurais. **Descritores:** Audição; Agricultor; Agrotóxico; Saúde do trabalhador.

RESUMEN

Objetivo: analizar la relación exposición a agrotóxicos y ocurrencia de alteraciones auditivas de trabajadores rurales. **Método:** investigación cuantitativa, descriptiva, explicativa y transversal. Se realizará con trabajadores rurales, del sexo masculino, expuestos a agrotóxicos, que residen en el municipio de Santa Rosa, región noroeste del RS, y que buscan atención en una Unidad Básica de Salud ubicada en la zona rural. Para la recolección de datos, se utilizará el cuestionario, la clasificación auditiva y la dosificación de colinesterasa plasmática y eritrocitaria. El proyecto respetó los procedimientos éticos y tiene aprobación por el Comité de Ética. Los datos serán almacenados en planilla electrónica y analizados con ayuda del software R v.2.15.3. **Resultados esperados:** se espera encontrar relaciones entre la exposición a agrotóxicos y la ocurrencia de alteraciones en el sistema auditivo y proporcionar subsidios para la elaboración de programas y políticas públicas de prevención de las pérdidas auditivas en trabajadores rurales. **Descriptores:** Audición; Agricultor; Agroquímicos; Salud Laboral.

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INTRODUCTION

Brazil is one of the world leaders in pesticide use, making rural labor one of the most dangerous occupations today.¹ Poisoning by agrochemicals, associated with the lack of public policies in rural workers' health, can result in serious damage to the health of these workers.² It should also be remembered that, in agriculture, the workplace is the environment and therefore the worker, the production and the environment are contaminated.³

Agrochemicals have been detected in samples of human blood, breast milk and food residues, which points to the possibility of association between the use of pesticides and the occurrence of neurological, hepatic, renal, respiratory, immunological and endocrine diseases.⁴ In addition, there is a hypothesis that pesticide exposure and / or intoxication is related to the increase in suicide rates.⁵

In addition to the general health implications, pesticides can be harmful to hearing, that is, potentially ototoxic.⁶ Likewise, hearing loss may be an early sign of pesticide poisoning.⁷

In Brazil, only workers with exposure to noise above 85dB are legally entitled to audiological control, according to Regulatory Norm 7 (NR7). There is no specific recommendation to evaluate the hearing of workers exposed to chemical agents, such as agrochemicals, when not exposed to excessive noise.⁸

OBJECTIVE

- To verify the association resulting from auditory screening and exposure variables to pesticides.
- To characterize the participants of the research regarding the sociodemographic aspects.
- To perform auditory screening on workers exposed to pesticides.
- To dosing of plasma and erythrocyte cholinesterase.
- To correlate the results of hearing screening and dosage of cholinesterases of workers exposed to agrochemicals.

METHOD

Quantitative, descriptive and explanatory research, observational and cross-sectional type. It will be carried out with rural workers exposed to the agrochemicals, who live in the municipality of Santa Rosa, in the northwest

region of RS, and who seek care in the Unified Health System (SUS), more specifically in a Basic Health Unit located in rural County. The study population will include individuals over the age of 18, male, who seek health care at the UBS described above. Participants who have alterations in the visual inspection of the external auditory meatus and / or hearing loss of non-occupational origin already diagnosed may not participate in the study. To define the sample, the probabilistic method will be used.

Firstly, a survey of the total number of rural workers, in the age group studied, will be carried out by analyzing the BHU medical records. The sample size will be calculated from the sampling design. Participants who will compose the sample will be randomly selected, proportionally to the age group, and invited by phone contact, by the researcher, to go to the BHU, where they will receive clarification about the study.

In order to collect data on the characterization of contact with the pesticides, the previous history of rural workers and current clinical history, a data collection instrument adapted from the protocol for the evaluation of chronic poisoning by pesticides organized by the State Department of Health Paraná (2013). Auditory thresholds will be measured with limed tone audiometry (LTA). Subsequently, participants will undergo laboratory examination to determine plasma cholinesterase and erythrocyte. Agrochemicals, mainly organophosphates, inhibit the enzymes responsible for the hydrolysis of acetylcholine, the primary neurotransmitter, and cause reduction of cholinesterase in the blood. Firstly, the contact with the coordinator of the BHU studied, the respective directors and president of the institution, was carried out to present the project, clarification regarding the objectives, procedures and stages of the project. There was interest from all parties and the health institution approved the research.

In the UBS, according to prior scheduling, the instrument of data collection and the auditive evaluation (visual inspection of the external auditory meatus and audiometric tonal threshold) will be performed. Pure tone audiometry will be performed with the Interacoustics brand, AD229, audiometer in a quiet BHU room. It will be necessary for the participant to have, at least, 14 hours of auditory rest. To determine the degree of hearing loss, the World Health Organization criterion will be adopted (WHO, 1997). Blood collection for evaluation of plasma and

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erythrocyte cholinesterase dosage will be performed at the BHU reference laboratory in accordance with all recommended ethical aspects. The official criterion of Regulatory Norm 7 (NR7), that is, a reduction of 50% of plasma cholinesterase and 30% of erythrocyte cholinesterase, will be used, as the cut-off point.

Subjects will only be submitted to research after receiving previous information about the objectives, procedures and risks of the study. All such information will be included in the Free and Informed Consent Form (TCLE). The data collected will be kept confidential. The project is in accordance with the ethical procedures recommended by Resolution 466/2012, approved by the Ethics Committee of the Federal University of the Southern Frontier (UFFS) and CAAE 61963416.3.0000.5564. The results of the evaluations will be made available to the participants, as well as being carried out due to referral in the case of alterations.

EXPECTED RESULTS

The research, is expected, to be able to find relationships between exposure to pesticides and the occurrence of changes in the auditory system of rural workers belonging to the Basic Health Unit of a municipality in the northwest region of RS. Also, it is intended, through the study's findings, to provide subsidies for the elaboration of programs and public policies for the prevention of hearing loss in rural workers, since, there is still no national legislation, in the labor legislation, requiring audiological monitoring for these workers.

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