GENOTOXICITY AND NUTRITIONAL STATUS IN INSTITUTIONALIZED ELDERLY INDIVIDUALS WITH MILD COGNITIVE IMPAIRMENT OR ALZHEIMER'S DISEASE

Isadora de Oliveira Monteiro[1], Otávio Lúcio Possamai[1], Rafaela Cristina Silva de Almeida[1], Helen Barbosa Vicente[1], Nicollas dos Santos da Silva[1], Marina Lummetz Magenis[1], Gabriel Paulino Luiz[2], Adrielly Vargas Lidio[3], Eduarda Behenck de Medeiros[3], Josiane Budni[3], Vanessa Moraes de Andrade[1]

[1]Laboratory of Translational Biomedicine, Postgraduate Program in Health Sciences, Universidade do Extremo Sul Catarinense, Criciúma, SC, Brazil
[2]Laboratory of Experimental Physiopathology, Postgraduate Program in Health Sciences, Universidade do Extremo Sul Catarinense, Criciúma, SC, Brazil
[3]Laboratory of Experimental Neurology, Postgraduate Program in Health Sciences, Universidade do Extremo Sul Catarinense, Criciúma, SC, Brazil

INTRODUCTION: The aging population has grown significantly in recent years, representing a complex process marked by the functional decline of biological systems and a higher risk of diseases, including neurodegenerative disorders such as Alzheimer's disease (AD). OBJECTIVE: Evaluate the genotoxicity and nutritional status of institutionalized elderly individuals with or without mild cognitive impairment (MCI) or AD. MATERIALS AND METHODS: This is a cross-sectional observational study conducted in long-term care facilities for the elderly in southern Santa Catarina, approved by the research ethics committee of the Universidade do Extremo Sul Catarinense (7.041.292). The study evaluated 29 elderly individuals in the control group, 17 in the MCI group, and 19 with AD, according to medical record diagnoses (the control group consisted of elderly individuals without an MCI or AD diagnosis). A sociodemographic questionnaire was used to gather data on age, sex, marital status, medication use, smoking, and alcohol consumption. Body mass index (BMI) was calculated as weight (kg) divided by height squared (m^2). The mini nutritional assessment (MNA) was used to classify the participants' nutritional status. To assess genotoxicity, peripheral blood samples were collected for the alkaline and oxidative Comet Assay using the Formamidopyrimidine DNA glycosylase (FPG) enzyme. RESULTS: No statistically significant differences were observed between groups for sociodemographic variables and BMI. The median MNA score was 25 in the control group, whereas elderly individuals with MCI and AD had lower average scores (20.25 and 20.50, respectively), indicating that most individuals with MCI and AD were at risk of malnutrition, without statistical significance. Elderly individuals with MCI or AD exhibited significantly higher levels of DNA damage compared to the control group ($P < 0.05$). CONCLUSION: The genotoxicity results suggest that inflammatory changes associated with MCI and AD may extend beyond the central nervous system. Given the limitations of accessing brain cells, detecting DNA damage in peripheral blood cells may represent an important biomarker. The observed risk of malnutrition reinforces the need for continuous nutritional monitoring in elderly individuals. Thus, intervention strategies may be essential to reduce genetic damage and support the nutritional health of this population.

Keywords: Aging; DNA damage; Nutritional status.

Funded by: CAPES; CNPq; FAPESC; UNESC.