

DNA DAMAGE AND REPAIR THROUGH THE SINGLE-CELL GEL ELECTROPHORESIS AND CYTOKINESIS-BLOCKED MICRONUCLEUS ASSAYS IN INDIVIDUALS WITH ATAXIA-TELANGIECTASIA AND THEIR PARENTS

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Ataxia-telangiectasia (AT) is a multisystem, complex and rare disease, inherited in an autosomal recessive manner. It is characterized by a variety of pathological manifestations: progressive cerebellar ataxia, telangiectasia, profound immunodeficiency, thymic atrophy, elevated serum alpha-fetoprotein, growth retardation, gonadal dysgenesis, premature senescence, accelerated telomere shortening, increased sensitivity to the cytotoxic and clastogenic effects of ionizing radiation, chromosome instability and increased risk of developing cancer. According to some studies, heterozygotes do not present clinic symptom of the disease, only a higher risk of developing cancer. Based on this information, this study evaluated the rates of DNA damage in AT patients, and in their parents, compared to a control group. Single Cell Gel Electrophoresis (SCGE) and Cytokinesis-Blocked Micronucleus (CBMN) assays were used spontaneously and with the induction of damage by bleomycin or ionizing radiation, aiming to evaluate the genomic instability and repair capacity. We evaluated 14 patients, 12 parents and 14 controls, with respective mean age: 16.93 ± 10.62 ; 40.25 ± 10.74 and 26.93 ± 11.87 . The results showed that the use of CBMN assay without inducing damage is sufficient for differentiation of patients, parents and controls, including levels of micronuclei (MN), nucleoplasmic bridges (NB) and nuclear BUDs. It was impossible to distinguish the groups with the SCGE spontaneous assay, but monitoring the kinetics of DNA repair through this technique was verified that the group of patients showed a delay in the repair process, compared with controls. The findings in the two techniques are complementary, and their combination appears highly recommendable in the identification of chromosomal instability in order to assist in the diagnosis of AT patients.