Cisplatin-induced human peripheral blood mononuclear cells oxidative stress and nephrotoxicity in head and neck cancer patients: The influence of hydrogen peroxide

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Cisplatin is a widely used chemotherapeutic in the treatment of head and neck cancer. However, its use is restricted due to cisplatin's nephrotoxicity caused by oxidative stress. The aim of the study was to characterize oxidative stress in peripheral blood mononuclear cells and its effect in nephrotoxicity induced by cisplatin. It was a prospective clinical and observational study at a hospital in Brazil. Before and after five days of the chemotherapy were collected blood of twenty-four patients to the realization of the MitoSox Red, H2DCF-DA and Amplex Red tests to determinate oxidative stress. Renal function was expressed in serum creatinine, creatinine clearance, and blood urea nitrogen (BUN). Serum creatinine and creatinine clearance were classified by CTCAE. No test showed significant variation after chemotherapy. Serum creatinine varied from 0.8 ± 0.2 to 1.6 ± 1.1 mg/dL ($p < 0.001$); creatinine clerance from 100.0 ± 24.4 to 57.0 ± 25.8 mL/min ($p < 0.001$); BUN from 26.2 ± 7.8 to 61.7 ± 28.4 ($p < 0.001$). H_2O_2 production was correlated with greater variations of serum creatinine ($p = 0.004$) and were associated with higher grades of toxicity of serum creatinine ($p = 0.004$) and creatinine clearance ($p < 0.001$). A linear regression analyses showed a significant univariate with a positive relation between H_2O_2 production and serum creatinine ($p = 0.013$), creatinine clearance ($p = 0.046$), and BUN ($p = 0.032$); and a significant multivariate positive relation between H_2O_2 production and BUN ($p = 0.040$). In conclusion, H_2O_2 was related with changes in all the renal parameters.

Biography

Patricia Moriel is a full Professor in the Faculty of Pharmaceutical Science at State University of Campinas (UNICAMP), Brazil. She is leader of the Clinical Pharmacy Group that is involved in the study of pharmacotherapy, drug adverse events, pharmacovigilance, pharmacokinetic e pharmacogenomics influences in adverse events, especially in cancer. She has authored more than 45 research articles, awards, conferences and the granting of a research projects. She has been director of several works of Master in medical and pharmaceutical science and doctoral theses

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