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Evaluation of vitamin B12 effects on DNA damage induced by paclitaxel.

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Abstract: Paclitaxel (PAC) is an anticancer drug that has been shown to generate free radicals leading to irreversible cell injury. Vitamin B12 has antioxidative properties and can protect DNA from free radicals. In this study, we examined the possible genotoxic effect of PAC on DNA as well as the possible protective effect of vitamin B12 on DNA damage induced by paclitaxel. Sister chromatid exchanges (SCEs), chromosomal aberrations (CAs) and 8-hydroxy-2'-deoxyguanosine (8-OHdG) levels were measured in cultured human blood lymphocytes treated with PAC (10 μ M) and/or vitamin B12 (2.7 mg/mL). Our results showed that PAC significantly increased the frequencies of SCEs ($p < 0.001$) and CAs ($p < 0.001$) in human blood lymphocytes, as compared to controls. These DNA damages, caused by PAC drug, were prevented by pretreatment of cells with vitamin B12. In addition, we showed that PAC induced an increase in 8-OHdG, a marker of oxidative DNA damage, and that this increase was prevented by vitamin B12. Vitamin B12 seems to protect against genotoxicity induced by PAC in human blood lymphocytes.