Evaluation of cytotoxicity and anti-inflammatory activity on human neutrophils of cocaine, an alkaloid isolated from *Erythroxylum coca*.

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**Introduction:** Cocaine (Coca) is the main active constituent found in the leaves of *Erythroxylum coca*, a native plant to the tropical zone of the Andes. It is an inhibitor of catecholamine reuptake by noradrenergic nerve endings increasing the effects of peripheral sympathetic nerve activity as a sense of euphoria, wellbeing and disinhibition. It may cause disorders in the cardiovascular, hepatic, neuromuscular and Central Nervous System (CNS), leading to increased morbidity and mortality.

**Experimental part:** Human polymorphonuclear cells (2.5x10⁶ cells/mL), mainly neutrophils (80-90%) were exposed to Coca (10, 25, 50 and 100µg/mL), HBSS (negative control), Triton x-100 (cytotoxic drug) or vehicle (DMSO 4%) to evaluate the cytotoxic effect by lactate dehydrogenase (LDH) activity as well as the MTT test. The evaluation of anti-inflammatory activity was measured through the release of the enzyme myeloperoxidase (MPO) in the supernatant of neutrophils stimulated with PMA (0.1µM) and incubated with Coca (10 to 100µg/mL), HBSS (negative control), Indomethacin (INDO, 35.7µg/mL, standard drug) or DMSO 4% (vehicle control). The results were expressed as mean ± SEM as percentage of inhibition.

**Results/Discussion:** The results showed that Coca (10 to 100µg/mL) did not increase the activity of LDH (15.03±2.54, 15.14±1.78, 14.94±0.75 and 16.78±1.23%, respectively) compared to control (10.17±1.23%). Findings were confirmed by the MTT assay in which Coca (10 to 100µg/mL) had no effect (102.5±4.57, 103.8±4.96, 96.96±4.80 and 97.14±3.38%, respectively) compared to control (96.34±1.99%). The Coca had an inhibitory effect of MPO release at concentrations 50 and 100µg/mL (44.31±4.74 and 51.48±3.0%, respectively) compared to control (100% of release). The similar inhibition was observed with INDO (54.95 ± 3.23%).

**Conclusion:** Cocaine has anti-inflammatory activity related to inhibition of the enzyme MPO release, and this effect is not related to cytotoxicity.

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