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CANNABINOIDS REDUCE INFLAMMATION IN INSULIN-RESISTANT AND OBESE MALE WISTAR RATS

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Type 2 Diabetes (T2D) is a metabolic disease characterized by insulin resistance, inflammation and obesity; it is accompanied by carbohydrate, lipid and protein metabolism dysfunction. T2D is characterized by insulin resistance in the peripheral tissues (adipose tissue, skeletal muscle tissue and liver). By 2030, T2D will be the 7th leading cause of death worldwide. Adipose tissue secretes signaling molecules, known as cytokines, which may exert their roles in either an anti-inflammatory (adiponectin) or pro-inflammatory way (leptin, tumour necrosis factor alpha and interleukin-6). During obesity, adipose tissue is invaded by macrophages which in turn release pro-inflammatory cytokines; resulting in obesity-associated low-grade inflammation, see Figure 1. Cannabinoids are terpenoids derived from the plant Cannabis sativa; and have been traditionally used as anti-inflammatory agents in Southern Africa. Methodology & Theoretical Orientation: This study investigated the effects of three concentrations of Cannabis Extract (tetrahydrocannabinol: 1.25 mg/kg; 2.5 mg/kg and 5 mg/kg) on the cytokine profile of diet-induced obese (high fat diet and high carbohydrate diet) and insulin resistant (high fat diet) male Wistar rats. Cytokine levels were continually monitored using Preprotech ELISA kits, blood smear analysis monitored White Blood Cells counts and immune system function. Conclusion & Significance: Results indicate that cannabis extract (tetrahydrocannabinol at 1.25 mg/kg) ameliorates pro-inflammatory cytokine levels in diet-induced obese, but not insulin resistant Male Wistar rats; suggesting that Cannabis extract may possess anti-inflammatory activities and may be used to ameliorate insulin resistance before the development of T2D.