

Title : Effects of Herbal Formulas on Male Reproductive System of High-Fat Diet and Streptozotocin-Induced Male Obesity and Diabetes in Rat.

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Major : Zoology

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ABSTRACT

Obesity is a major risk factor for the development of type 2 diabetes, affecting both metabolic function and the male reproductive system. Studies have reported that obesity and diabetes contribute to reduced sperm quality, impacting motility, viability, and concentration, which are closely linked to male infertility. This study aimed to investigate the effects of two newly formulated herbal mixtures compared to synthetic medications, including metformin, orlistat, and atorvastatin, on the male system of albino rats induced with obesity and diabetes. Two herbal formulas were tested. Formula 1 consisted of *Dracaena cochinchinensis*, *Milium velutinum*, *Emblica officinalis*, *Piper interruptum*, and *Albizia procera*, whereas Formula 2 consisted of *Cinnamomum bejolghota*, *Milium velutinum*, *Acacia concinna*, *Ocimum gratissimum*, and *Albizia procera*. Male Wistar rats were divided into nine experimental groups, including a normal control group, a negative control group, two normal groups treated with herbal formulas, and obesity- and diabetes-induced groups treated with three conventional drugs. Obesity and diabetes were induced by high-fat diet and streptozotocin. Oral treatments were administered for one month. Reproductive organ weights were measured, and sperm quality was assessed by analyzing sperm motility, viability, and concentration, along with histological evaluations of the testes. The results showed that the negative control group exhibited a decline in relative reproductive organ weights, as well as reductions

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in sperm concentration, progressive motility, viability, and normal morphology compared to the normal control group. Treatment with Formula 1 and Formula 2 improved relative reproductive organ weights and restored sperm quality in obesity- and diabetes-induced rats. Additionally, histological analysis revealed that the herbal formula-treated groups improved structural changes in the testicular tissues of obesity- and diabetes-induced rats. These findings suggest that the novel herbal formulas have potential therapeutic efficacy in mitigating the adverse effects of obesity and diabetes on the male reproductive system.

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