Title : Effects of Herbal Formulas on Oxidative Status in the Male Reproductive System and Penile Tissue of Hyperglycemia-and Hypercholesterolemia-Induced Rats.

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Major : **Zoology**

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ABSTRACT

Obesity and diabetes are significant factors contributing to oxidative stress, which results from an imbalance between free radicals and antioxidants. Oxidative stress in male reproductive system leads to erectile dysfunction and reduced sperm fertilization capacity. Currently, herbal medicine has gained popularity for treating various diseases and alleviating male sexual dysfunction caused by obesity and diabetes. Thus, the objective of this study was to evaluate the effectiveness of two novel herbal formulations in high-fat-diet and streptozotocin-induced hyperglycemia and hypercholesterolemia in male rats. The two novel herbal formulas consisted of Formula 1 (*Dracaena cochinchinensis*, *Miliusa velutina*, *Emblica officinalis*, *Piper interruptum*, and *Albizia procera*) and Formula 2 (*Cinnamomum bejolghota*, *Miliusa velutina*, *Acacia concinna*, *Ocimum gratissimum*, and *Albizia procera*). Hyperglycemia-and hypercholesterolemia-induced rats were treated with these herbal formulas for one month, and the effects were compared to those in normal rats. Synthetic drugs commonly used to treat obesity and diabetes, including orlistat, metformin and atorvastatin, were used as positive controls. Oxidative stress indices, including malondialdehyde (MDA), reduced glutathione (GSH), superoxide dismutase (SOD), and catalase (CAT) were examined in testes, epididymis, seminal vesicles, seminal fluid, prostate gland, and sperm suspension.

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Additionally, sperm capacitation and histology of erectile tissue in penis were investigated. The results demonstrated that both herbal formulations effectively reduced oxidative stress in the male reproductive system by lowering MDA levels and increasing antioxidant enzyme activities. Furthermore, formula 1 significantly ($p < 0.05$) promoted penile erection by reducing fibrosis in the corpus cavernosum of hyperglycemia-and hypercholesterolemia-induced rats. However, neither herbal formula had any effect on enhancing sperm fertilization capacity.

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