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EFFECTS OF *PIPER SARMENTOSUM* LEAF EXTRACT ON BONE BIOMECHANICAL STRENGTH IN GLUCOCORTICOID-INDUCED OSTEOPOROTIC MALE RATS

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ABSTRACT

Glucocorticoid-induced osteoporosis is the most common cause of secondary osteoporosis. Glucocorticoids have a profound impact on bone, predominantly through modulation of bone formation but also through effects on bone resorption. Long-term glucocorticoid therapy is associated with rapid bone loss and deterioration of bone quality. *Piper sarmentosum* (Ps) extract is known to possess antioxidant and anti-inflammatory activity. In this study, we determined the effects of *Piper sarmentosum* leaves on bone biomechanical strength in glucocorticoid-induced osteoporotic rats. Three-month old male Sprague-Dawley rats (300-350g) were adrenalectomized to remove the main source of circulating glucocorticoids. These animals were induced with dexamethasone 120µg/kg body weight/day. Treatment with water-based *Piper sarmentosum* leaves extract 125mg/kg body weight and glycyrrhizic acid (GCA) 120µg/kg body weight were given for 2 months. Following sacrifice, the right femora were taken for biomechanical assessment. Three parameters were taken for analysis (flexure modulus, flexure strain at break, and energy at break). The results showed that *Piper sarmentosum* leaves extract was able to significantly prevent the glucocorticoid-induced biomechanical changes in flexural modulus, flexure strain at break, and energy at break ($p < 0.05$). The results showed that *Piper sarmentosum* leaves extract was able to prevent loss in bone biomechanical strength due to long-term glucocorticoid. Thus *Piper sarmentosum* may have the potential to be used as prophylaxis against osteoporosis and fractures in patients on long-term glucocorticoid treatment.

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