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**Exogenous Leptin Administration Enhances the Effect of MNNG-Induced Morphological Changes in the Stomach of Male Sprague-Dawley Rats**

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**ABSTRACT**

Obese individuals are at a higher risk of developing gastric cancer. Whether this is related to the higher serum leptin levels in obese individuals is uncertain but leptin has been shown to promote the proliferation of gastric cancer cell growth in vitro. Its impact on tumour formation in vivo has not been examined. This study therefore examined the effect of leptin in a rat model of N-methyl-N′-nitro-N-nitrosoguanidine (MNNG)-induced gastric adenocarcinoma. Six-week old male Sprague-Dawley rats were divided into 4 groups (n=8). Group 1 served as a control. Group 2 was given 24 mg/kg/day of MNNG in drinking water. Group 3 was given 24 mg/kg/day MNNG in drinking water and intraperitoneal injection of 60 µg/kg/day of leptin. Group 4 was given intraperitoneal injection of 60 µg/kg/day of leptin. Body weight was measured weekly. Rats were euthanized after 40 weeks of treatment. Stomachs were collected for histo-pathological study. Data were analysed using two-way ANOVA and Fisher’s exact test. White tumour nodules were evident in 37.5% of MNNG+LEPT-treated and 25% of MNNG-only treated rats. None were seen in the control or in leptin-only treated rats. Microscopically, stomachs of 75% of MNNG+LEPT-treated rats either had hyperplasia (25%), dysplasia (25%), hypertrophy and dysplasia (12.5%), and dysplasia and adenocarcinoma (12.5%). This was statistically significant from the controls (p<0.01). Gastric hyperplasia was observed in the stomachs of 50% of MNNG-treated rats, and was statistically significant from the controls (p<0.05). Stomachs of leptin-only treated rats had either gastric hyperplasia (12.5%) or gastric dysplasia (12.5%). No significant differences were evident in body weight between the groups. It appears that leptin significantly enhances MNNG-induced gastric hyperplasia, dysplasia, and hypertrophy in male Sprague-Dawley rats, which supports the potential role of leptin as a contributing factor to the increased risk of developing gastric cancer among obese individuals.