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Impact of Teriparatide Acetate on Caspase-9 Gene Expression in Relation to Histological and Tunnel Assay of Apoptosis in Rat Kidneys and Livers

ABSTRACT:

The study aimed to evaluate the effects of Teriparatide on liver and kidney tissues in rats and to examine the relationship between these effects and the gene expression of caspase-9 focusing on the mechanism of apoptosis. The experiment included 20 male rats divided into a control group and a Teriparatide-treated group, and administered 10 µg/kg subcutaneously daily for 30 days. Histological analysis revealed significant pathological changes in the liver including portal vein congestion, increased fibrous tissue, bile duct hyperplasia, degeneration, hepatocellular necrosis and sinusoidal dilation. In the kidneys were observations of glomerular atrophy, Bowman's space dilation, hyaline casts in the tubular lumen, vacuolar degeneration and necrosis of the tubular epithelial cells, along with hemorrhage and inflammatory cell infiltration. TUNEL assay showed high levels of apoptosis in the liver and kidney tissues of the teriparatide-treated group. Regarding Caspase-9 gene expression, all positive samples indicated the presence of the gene at the 153 bp site, suggesting its activation in liver and kidney tissues. There was a substantial increase in Caspase-9 gene expression in the liver and kidneys compared to the control group. The study also showed that high doses of Teriparatide have severe side effects on the liver and kidney tissues of rats, where there was a clear activation of the intrinsic caspase-9 apoptotic activation pathway and with TUNEL analysis. The kidneys and liver were also impacted to a greater extent.