Evaluation of Adrenomedullin Antagonist in the Suppression of Ovarian Cancer

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Abstract:

Ovarian cancer remains a leading cause of morbidity and mortality among women worldwide, with limited therapeutic options due to late-stage diagnosis, chemoresistance, and significant treatment-related toxicities. This study investigates the anticancer potential of the adrenomedullin antagonist ADM 22-52 in a 7,12-dimethylbenz[a]anthracene (DMBA)-induced ovarian cancer model in female Wistar rats. ADM 22-52, a targeted antagonist of the adrenomedullin peptide, was assessed for its impact on tumor progression, apoptosis, oxidative stress, and endocrine regulation.

The study demonstrated that ADM 22-52 significantly inhibited tumor growth, reduced ovarian size, and downregulated proliferative and anti-apoptotic markers such as PCNA, Ki-67, and Bcl- 2, while upregulating pro-apoptotic markers, including caspase-3 and RAMP1 mRNA expression. ADM 22-52 also enhanced antioxidant enzyme activity (SOD, catalase, and GPx) and reduced lipid peroxidation, mitigating oxidative stress. Hormonal analysis revealed a restoration of progesterone levels and maintenance of estrogen balance, indicating its role in regulating endocrine disruptions associated with ovarian cancer. Importantly, ADM 22 -52 exhibited a favorable safety profile, with no significant adverse effects on liver, renal, or lipid parameters.

These findings highlight the therapeutic potential of ADM 22 -52 as an anticancer agent, demonstrating its ability to target tumor progression through multiple pathways, including apoptosis induction, oxidative stress mitigation, and tumor microenvironment modulation. Further studies are warranted to elucidate its mechanisms of action, optimize dosing regimens, and explore its efficacy in human trials, paving the way for its potential application in clinical oncology.