

19. THE INTERPLAY OF GROWTH HORMONE, INSULIN-LIKE GROWTH FACTORS, AND CANCER SUSCEPTIBILITY: A MEDICAL PERSPECTIVE



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Introduction. GH and IGF-I, known for promoting growth, are under scrutiny for their potential involvement in cancer progression. While we understand their normal effects, the disruption caused by these factors and their role in cancer initiation remain mostly unknown. Studies on transgenic mice and cancer cell lines indicate their contribution to tumor development.

Aim of study. To elucidate the intricate signaling pathways of growth hormone (GH) and insulin-like growth factors (IGFs) in cancer, providing foundational insights for targeted therapeutic interventions and advancing precision in cancer management.

Methods and materials. This scientific review is founded on a meticulous examination of 20 specialized articles retrieved from reputable databases such as: PubMed, Bioscientifica, and ScienceDirect over the last five years. Conducted with precision, it aligns with key words like: growth hormone, insulin-like growth factors, and cancer.

Results. GH and IGFs activate signaling pathways like Ras/MAPK and PI3K/Akt, fostering cell cycle progression and inhibiting apoptosis, which are critical in cancer development and progression. Abnormal activation of these pathways, often due to mutations in key elements like IGF-1R, can lead to uncontrolled cell division and oncogenesis. GH and IGFs also significantly contribute to angiogenesis, the formation of new blood vessels, crucial for tumor growth. They interact synergistically with factors like Vascular Endothelial Growth Factor (VEGF), amplifying angiogenesis and aiding in tissue repair and growth. In cancer, these hormones help tumor cells evade apoptosis and immune system detection, with IGFs exhibiting strong anti-apoptotic properties. Moreover, chronic hyperinsulinemia, a consequence of insulin resistance and metabolic disorders, characterized by elevated IGF-1 levels, is known to intensify the tumor-favorable environment in cancer. The tissue-specific effects of GH and IGFs vary across different cancer.

Conclusion. Ongoing research unravels the intricate role of GH and IGF-1 as a critical nexus in oncology, highlighting their significant impact on cell proliferation, survival, and apoptosis. Innovative multidisciplinary strategies like IGF-trap molecules and GH receptor inhibitors offer promising avenues in disrupting pivotal signaling pathways. Comprehensive knowledge of the intricate hormonal balance of cancer paves the way for innovative therapeutic strategies in the combat against the disease.