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Growth hormone secretion in obesity

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Statement of the problem: Metabolic substrates and nutritional status play a major role in growth hormone (GH) secretion. Adiposity is associated with decreased growth hormone secretion. The mechanism of altered GH secretion in obesity is unclear. The aim of this study was to investigate the mechanism responsible for the GH hyposecretion in obesity.

Methodology & Theoretical Orientation: The primary cause of impaired GH secretion in obesity could be an altered hypothalamus, abnormal pituitary function, or a perturbation of the peripheral signals acting at either the pituitary or hypothalamic level. We have reviewed the different clinical and experimental studies about the pathophysiological mechanism responsible for the GH hyposecretion in obesity.

Findings: Studies with the cholinergic agonist pyridostigmine support the idea that obesity is associated with a state of chronic somatostatin hypersecretion. The reduction of free fatty acids with acipimox enhanced GHRH-mediated and GHRH-plus GHRP-6-mediated GH release in obesity suggests that high free fatty acids contribute for the disrupted GH secretion. In obese patients there is a marked GH secretion after ghrelin alone or combined with GHRH. In addition, significant correlations have been found between the different indices of post-oral glucose GH and ghrelin secretion. These data suggest that ghrelin is a physiological regulator of GH in the post-oral glucose state, and that the decreased ghrelin secretion, present in obesity, could be one of the mechanisms responsible for altered GH secretion. The functional hyposomatotropism of obesity should be considered in the clinical evaluation of GH secretion. The reduced GH secretion of obesity has been associated with several cardiovascular risk factors although a cause-and-effect relationship has yet to be established.

Conclusions: The pathophysiological mechanism responsible for GH hyposecretion in obesity is multifactorial, and there is probably a chronic state of somatostatin hypersecretion, increased free fatty acids and decreased ghrelin.

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