

Effect of Obesity on Tissue Expression of Growth Hormone (GH) Receptor and Insulin-like Growth Factor-I RNA

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Introduction & Methods: Little is known about the subsequent changes in differential tissue expression of the GH receptor (GHR) and IGF-I response to GH hyposecretion related to human obesity. The present study investigated RNA expression of IGF-I as well as of full-length (GHRfl) and truncated GHR (GHRtr) by using RNase protection assay (RPA) in human liver and subcutaneous and visceral adipose tissues in six obese and age-matched lean individuals.

Results: The GHRfl level in liver was approximately 1.6- and 2-fold higher than in visceral and subcutaneous adipose tissues, respectively, whereas IGF-I levels were identical among the three tissues. The ratio of GHRfl to GHRtr was similar in all three tissues, approximately 5:1. The GHRfl, GHRtr and IGF-I RNA levels in liver tissue were not different between lean and obese individuals. The GHRfl and IGF-I RNA levels were significantly decreased in visceral and subcutaneous adipose tissues in obese individuals compared to those of lean individuals. Serum IGF-I level was correlated with IGF-I RNA levels in liver in both lean and obese individuals. There were positive linear correlations between serum IGF-I level and relative IGF-I RNA level in visceral and subcutaneous adipose tissues as well as estimated level of IGF-I RNA expression in adipose

tissue areas measured by CT scan only in obese individuals.

Conclusion: In summary, obese individuals had lower adipose tissue GHR RNA levels with similar hepatic GHR RNA expression compared to lean individuals. Although GH hyposecretion in obesity causes a decrease in the generation of IGF-I from each adipocyte, significantly greater amounts of IGF-I can be secreted from excessively accumulated adipose tissues in obesity than from other tissues. The present finding that the expression of GHRfl RNA was lower in adipose tissues and that the proportion of GHRtr RNA expression was similar to that in liver may indicate that the elevated circulating GHBP level in obesity most probably is derived from the increased amounts of adipose tissue.