

Effect of One-Year Growth Hormone Therapy on Serum levels of Ghrelin and Leptin in Children with Growth Hormone Deficiency and their Correlations with Cardiac Functions and dimensions

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Background

Controversial data on levels of ghrelin and leptin in patients with GHD have been published. Few have addressed the correlation between ghrelin and leptin with cardiac functions in patients with GHD.

Aim

To investigate the effect of one year GH therapy on serum levels of ghrelin and leptin in children with GHD and to study their correlations with cardiac functions and dimensions.

Patients and Methods

A prospective case-control study was performed on 23 pre-pubertal GHD patients and 14 age, sex and BMI matched controls. Conventional, cardiac tissue Doppler imaging and measurement of serum levels of ghrelin and leptin were done before (visit 1) and after one-year therapy with GH (visit 2).

Results

There was no significant difference in levels of ghrelin and leptin between patients and controls in both visits. Ghrelin in both visits correlated negatively with the ratio between maximum wave velocity of early and late diastolic filling across mitral annulus by TDI (E'm/A'm) as well as with left ventricular mass index (LVMI), while it correlated positively with ejection fraction (EF) only in visit 2.

Leptin correlated positively with left ventricular diameter in diastole (LVEDd) in both visits and only in visit 2 with aortic root (AO) diameter in both visits. Neither ghrelin nor leptin showed a significant correlation with other cardiac parameters. Ghrelin and leptin showed a significant negative correlation with each other (p= 0.015).

Discussion

Highlighting the impressive role of GH on cardiac functions, structure and dimensions has gained a lot of attention over the past years, however to date only few researchers studied the correlation of these two hormones with cardiac parameters in patients with GHD before and after GH therapy. Ghrelin in treated GHD patients correlated negatively with parameters of cardiac functions and dimensions denoting that ghrelin levels affects the cardiac functions and dimensions as previously reported.

Leptin in untreated patients correlated positively with LVEDd and with Ao after treatment with GH denoting that the higher the leptin level is the higher the level of these indices of cardiac dimensions. Hyperleptinemia was found to be associated with myocardial dysfunction in animal models.

Conclusion

Ghrelin and leptin have a direct role on cardiac dimensions and functions in patients with GHD after one-year therapy with GH

References

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Table 2 Ghrelin with cardiovascular parameters

Echo Parameter	Ghrelin V1		Ghrelin V2	
	r	p	r	p
EF%	.175	0.460	-.484	0.036
LVMI (gm/m ²)	-.584	0.009	-.554	0.014
E'm/A'm	-.563	0.012	-.556	0.013

Table 3 Leptin with cardiovascular parameters

Echo Parameter	Leptin V1		Leptin V2	
	r	p	r	p
LVEDd (mm)	.580	0.009	.578	0.009
Ao (mm)	.248	.292	.514	0.024