NEUROLOGY INDIA
Publication of the Neurological Society of India

NI FEATURE: THE EDITORIAL DEBATE II-- PROS AND CONS
Year : 2017 | **Volume** : 65 | **Issue** : 6 | **Page** : 1225--1226

Echocardiographic improvements following transsphenoidal surgery for acromegaly

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How to cite this article:
Ribeiro-Oliveira A, Korbonits M, Freire CM. Echocardiographic improvements following transsphenoidal surgery for acromegaly.Neurol India 2017;65:1225-1226

How to cite this URL:
Ribeiro-Oliveira A, Korbonits M, Freire CM. Echocardiographic improvements following transsphenoidal surgery for acromegaly. Neurol India [serial online] 2017 [cited 2019 Oct 25];65:1225-1226
Available from: http://www.neurologyindia.com/text.asp?2017/65/6/1225/217983

Full Text

Cardiovascular disease represents the most prevalent comorbidity in acromegaly, accounting for up to 80% of complications and it has been reported to importantly contribute to death.[1] In this issue of Neurology India, Srinivasan et al., aimed to evaluate the effect of transsphenoidal surgery (TSS) on the echocardiographic parameters of patients with acromegaly. They also evaluated the possible impact of postoperative normalization of growth hormone (GH) and insulin-like growth factor type 1 (IGF-1) on the echocardiographic parameters of these patients. Few publications have attempted to address the changes in echocardiographic parameters related to TSS as well as the impact of acromegaly control on these changes. The authors showed that a reduction in GH and IGF-1 levels following surgery for acromegaly is accompanied by an increase in the left ventricular ejection fraction (EF) in patients who were cured. Furthermore, a decrease was also observed in the cardiac left ventricular mass (LVM), which might contribute to the improvement of diastolic function of the heart.[2] These findings could eventually be related to a decrease in the morbidity and mortality associated with acromegalic cardiomyopathy. Indeed, the control of acromegaly has been shown to reduce mortality, including that from cardiovascular and neoplastic causes.[3]

The study design comprises of a prospective (n = 38) and a retrospective (n = 62) group of patients with acromegaly. Unfortunately, the majority of the echocardiographic data for the retrospective group is not available, thus limiting this whole group to the sole understanding of their systolic function through EF. However, it was impressive to see that EF of the patients improved even when a complete normalization of GH nadir levels after oral glucose tolerance test (oGTT) was not achieved. It is noteworthy to mention that EF was significantly increased in both the prospective and retrospective groups after TSS, except when oGTT suppressed GH levels exceeded 5 ng/mL. These data are well aligned with our current understanding of the importance of acromegaly control in the outcomes of this population.[3] Although the majority of the population with acromegaly does not usually show signs of left ventricular (LV) systolic dysfunction in clinical practice, the data coming from this study is still enthusiastically showing an improvement of EF postoperatively, which may favourably impact the evolution of acromegalic cardiomyopthy.

In the prospective group of patients, the left ventricular mass (LVM) as well as LVM index improved after TSS. Improvements were seen in both cured patients as well as in those with oGTT suppressed GH values below 5 ng/mL, as were the findings observed for EF. The authors report that a baseline LV dysfunction was present in 47.3% of patients in the prospective group, followed postoperatively by normalization of LV function in over half of these patients. However, we need to note that it is rather uncommon to see such a high prevalence of systolic dysfunction in patients with acromegaly, when patients with clinical signs of cardiac failure have been excluded from the study. Indeed, LV hypertrophy rarely leads to systolic dysfunction until heart failure ensues, which is usually observed in the end-stage of acromegaly associated cardiomyopathy.[4] Therefore, normalization or improvement of systolic function was shown in an unusual set of patients enrolled to their study.

The most striking functional disturbance in acromegalic cardiomyopathy is the diastolic dysfunction, which is usually present right from the earlier stages of the disease.[5],[6] It is initially manifested by an inadequate ventricular filling capacity, as demonstrated by the decrease of early (E) to late or atrial (A) peak velocities ratio (E/A) and the prolongation of the isovolumetric relaxation time (IVRT).[5] Although it is known that normal values of IVRT and E/A cannot rule out left ventricular diastolic dysfunction as a result of pseudo-normalization, there are insufficient details available from this study to judge this issue. In the current study, a decrease in LVM index was taken as an alternative indirect indicator of left ventricular diastolic function improvement in the absence of other proper diastolic parameters.

Considering the key importance of diastole in acromegalic cardiomyopathy, it would have been beneficial to present the tissue Doppler data regarding diastolic dysfunction, even in patients with systolic dysfunction, taking into account the fact that the presence of systolic dysfunction can lead to some degree of diastolic dysfunction. There are four important diastolic echocardiographic parameters that are usually evaluated in an echocardiographic study of diastole.[7] The evaluation of these parameters, showing an improvement following cure or biochemical control of acromegaly, would have shed light into the evolution of diastolic echocardiographic parameters in these patients. Therefore, although the decrease of LVM index observed in this study suggests an improvement in the left ventricular diastolic function, the lack of comprehensive diastolic data hinders the understanding of the cardiac status of patients and, therefore, the recognition of possible novel therapeutic avenues.

There are some common additional important features influencing the full phenotype of acromegalic cardiomyopathy. The prevalence of either valvulopathy or arrhythmias is not reported in this study, while it is known that they may interfere with some of the analysis performed.[7] The authors, however, controlled their data for confounders, such as age, sex, presence of hypertension, diabetes mellitus, hypocortisolism and hypothyroidism by using a multinomial logistic regression analysis including the state of the disease (according to oGTT nadir) as the dependent variable, and they concluded that none of these affected the evaluated echocardiographic parameters. This analysis, although not shown in detail, has strengthened the study since the common possible interference of diabetes and hypertension per se has been ruled out.

Although this study carries several limitations, some of them acknowledged by the authors, it is of note that TSS was shown to improve systolic function, even when the procedure of TSS was just improving but not completely curing the patients. Furthermore, there was a decrease in LVM in these patients, which suggests an improvement in diastolic function. These data are probably related to an improvement in the biochemical control of acromegaly and it may probably account for a decrease in the prevalence of cardiac mortality in these patients. Future studies should prospectively and comprehensively evaluate the echocardiographic parameters, especially the diastolic ones, in patients with acromegaly, in order to confirm the data shown in this study, as well as to provide further insights into these specific features of acromegalic cardiomyopathy.

References

1 Holdaway IM, Rajasoorya RC, Gamble GD. Factors influencing mortality in acromegaly. J Clin Endocrinol Metab 2004; 89:667-74.
2 Srinivasan A, Bahl A, Bhagat H, Dutta P, Rai A, Devgun JS, *et al*. Impact of transsphenoidal surgery on asymptomatic cardiomyopathy in patients with acromegaly. A single-blinded study. Neurol India 2017;65:1312-6.
3 Maione L, Brue T, Beckers A, Delemer B, Petrossians P, Borson-Chazot F, *et al*. Changes in the management and comorbidities of acromegaly over three decades: The French Acromegaly Registry. Eur J Endocrinol

2017;176:645-5.

4 Colao A, Ferone D, Marzullo P, Lombardi G. Systemic complications of acromegaly: Epidemiology, pathogenesis and management. Endoc Rev 2004;25:102-52.

5 Colao A, Marzullo P, Di Somma C, Lombardi G. Growth hormone and the heart. Clin Endocrinol 2001;54:137-54.

6 Thomas JDJ, Dattani A, Zemrak F, Burchell T, Akker SA, Kaplan FJL, *et al*. Renin-angiotensin system blockade improves cardiac indices in acromegaly patients. Exp Clin Endocrinol Diabetes 2017;125:365-7.

7 Naguch SF, Smiseth OA, Appleton CP, Byrd BF, Dokainish H, Edvardsen T, *et al*. Recommendations for the evaluation of left ventricular diastolic function by echocardiography: An update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. J Am Soc Echocardiog 2016;29:277-314.