ORIGINAL REPORTS: CASE STUDY

ACROMEGALY PRESENTING AS CARDIAC FAILURE

Felicia Anumah, MBBS, MWCP, FMCP;
Solomon Danbauchi, MBBS, FWCP; Sani Garko, MBBS, FWCP

Background: In acromegaly, specific structural and functional changes in the heart appear to contribute to the increased mortality in this disease. This disease is uncommon in Nigeria, West Africa and little has been published about it; also rare is clinically evident heart failure. We are therefore highlighting a late presentation of acromegaly as heart failure.

Case Report: A 45-year-old woman presented with a 4-year history of progressive increase in body size, lactation and amenorrhoea, and a six-week history of worsening symptoms of heart failure. Physical examination showed coarse facial features, spade like hands and feet, pitting pedal edema, galactorrhoea, and features of congestive cardiac failure. Chest radiograph showed gross cardiomegaly. On skull radiograph, destruction of the floor of the pituitary fossa was noted, with erosion of the clinoid processes. She had hyperprolactinamia. Fasting and post-glucose growth hormones values were elevated.

Echocardiography revealed features of both diastolic and systolic dysfunction with left ventricular hypertrophy and dilation. A diagnosis of acromegalic cardiomyopathy in severe congestive heart failure was made. She was managed with anti-heart failure drugs with good results and subsequently began on a dopamine agonist. She was lost to follow up.

Conclusions: Acromegaly is uncommon in our practice. This patient presented late with complications. Management was very difficult because of the combination of severe complications and lack of resources. (*Ethn Dis*. 2008;18:104–106)

Key Words: Acromegaly, Acromegalic Cardiomyopathy, Congestive Heart Failure

From the Medicine Department, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria (FA, SD, SG).

Address correspondence and reprint requests to: F. E. Anumah; Medicine Department; Ahmadu Bello University Teaching Hospital; Zaria; 2348033109028; anumahma@yahoo.co.uk

INTRODUCTION

Acromegaly is a rare pituitary disorder; because it is a chronic and slowly developing disease, clinically progressive disfigurements or disabilities go unnoticed, and diagnosis can be delayed.[1] Acromegaly is usually caused by a growth hormone (GH), secreting anterior pituitary adenoma, which leads to increased production of insulin-like growth factor 1 (IGF-1).

The disease affects 40–60 people per million with an annual incidence of 3–4 cases per million[2] Men and women appear to be equally affected, and the average age of presentation is 44 years. Approximately a third of cases are accompanied by hyperprolactinemia. Acromegaly is associated with a two- to three-fold increase in mortality compared with that of the age- and sex-matched general population.[3,4] Before the advent of effective therapy, ≈80% of patients died before the age of 60 years from cardiovascular disease.[5]

Acromegaly is an uncommon disease in Nigeria, West Africa and few reports from this part of the world have been published about this disease. Clinically evident heart failure is also an uncommon presentation in acromegalics, but we describe late-stage acromegaly in a 45-year-old woman who presented with heart failure.

CASE REPORT

A 45-year-old housewife presented at the Ahmadu Bello University Teaching Hospital Kaduna with a 4-year history of progressive increase in the size of her hands and feet, excessive oiliness of the skin, separation of her teeth, and difficulty in chewing. At the same time, she noticed a gradual increase in the size of her breasts, lactation, and cessation of menstrual flow. She had a gradual deterioration of her vision and was unable to recognize distant objects. She was diagnosed with hypertension 1.5 years before presentation and was on diuretic therapy. She had no symptoms of diabetes. Six weeks before presentation, she developed dyspnea on exertion, which progressed to dyspnea at rest, orthopnea, paroxysmal nocturnal dyspnea, body swelling, and cough productive of frothy sputum. There was severe pain in the major joints with easy fatigability.

Examination findings revealed a body mass index of 30 kg/m^2, waist circumference of 101 cm, hyperpigmented oily skin, thickened and prominent supraorbital ridges, prominent zygomatic arches, gapped dentures, and spade-like hands and feet. She also had pitting pedal edema and swollen, non-tender breasts with expressive galactorrhea and mild pallor. Her pulse rate was 110 bpm, regular, but of small volume. Supine blood pressure was 120/80 mm Hg, with a nonpalpable apex beat, probably due to the thick chest wall. The heart sounds were S1, S2, and S3 gallop with a mitral regurgitation murmur. Other findings were bilateral basal crepitations in the chest, a tender hepatomegaly (14 cm below the right coastal margin), and a bitemporal hemianopia.

Investigation results showed normocytic, normochromic anaemia with a packed cell volume of 28%. Chest radiograph showed gross cardiomegaly, destruction of the floor of the pituitary

Table 1. Hormonal assays

Hormones	Serum levels	Range
T_3	0.42	(0.45–1.37 ng/mL)
T_4	7.38	(4.5–12 ug/ml)
TSH	1.46	(0.49–4.67 uiu/mL)
FSH	1.36	(4–13 miu/mL)
LH	0.03	(1–18 miu/ml)
PRL.	>200	(1.39–24 ng/mL)

PRL= Serum prolactin levels.

fossa was noted on skull x-ray, with erosion of the clinoid processes. On oral glucose tolerance test, the fasting and 1 hour post glucose load blood glucose values were 4.9 and 8,4 mmol/l respectively, while the corresponding growth hormone values were elevated and remained constant at 270 (normal 0–8) ng/ml. Other hormonal assays and echocardiography results are shown in Table 1 and 2.

The patient was managed with an anti-heart failure regimen and bromocriptine therapy. She had significant recovery from heart failure but could not afford to maintain consistent bromocriptine therapy. She was lost to follow up before significant changes in acromegalic features could be appreciated.

DISCUSSION

Considerable evidence suggests that specific cardiomyopathy in acromegaly can result in structural and functional abnormalities, which may be partially reversed by effective reduction in GH and IGF-1 levels.[1,6] The patient in this report had massive cardiomegaly with a cardiothoracic ratio of ≈0.9. In acromegaly, cardiac enlargement is a consistent finding and seems to be disproportionate, compared with the increase in size of other internal body organs.[1] An increased frequency of systemic hypertension and premature coronary artery disease have also been described.[1]

Studies in acromegalic cardiomyopathy have shown myocardial hypertrophy with interstitial fibrosis, lymphomononulear infiltration, and areas of monocyte necrosis resembling myocarditis. These changes often result in increased left ventricular mass and concentric hypertrophy.[1,7] Left ventricular hypertrophy occurs first, often leading to slow deterioration of diastolic function early in the disease.[8,9] This finding has been reported in acromegalic patients <40 years old, with disease duration shorter than five years.[10,11] Our patient presented at age 45 and had had the disease for more than four years, with exercise intolerance for two years before presenting to us.

Clinically evident congestive heart failure may develop when the disease is untreated or unsuccessfully treated.[10] Our patient sought medical attention because of severe symptoms of congestive heart failure. Data are limited on clinically evident heart failure in acromegalics. Damganovics et al reported high-output failure in 10% of patients, while Hayward et al found only 7 out of 256 patients (<1%) with clinically evident heart failure.[12,13]

Echocardiographic findings in this patient showed significant increase in end-systolic and end-diastolic dimensions, reduction in the ejection fraction and fractional shorting, and reversal of the E/A ratio, in the presence of severe signs of congestive heart failure. These echocardiographic features have been documented in young acromegalics without any clinical evidence of cardiac impairment.[10] Cardiac dysrhythmias have been documented in a few reports, due to the left ventricular remodeling that occur in this disease.[14,15] However, our patient did not present with any form of ventricular arrythmia.

Treatment is aimed at removing the source of GH hypersecretion or at suppressing its activity. Somatostatin analogs are effective as first-line therapy and have a success rate of 45%–65%.[16,17] Our patient was, however, placed on the relatively cheaper and more available bromocriptine therapy.

Table 2. Echocardiography results

M. Mode measurement	Patient values	Normal values
Interventricular septum in diastole (IVSd)	1.8	(0.6–1.1 cm)
Left ventricular internal diameter in diastole (LVIDd)	7.2	(3.5–5.7 cm)
Left posterior wall thickness in diastole (LVPWd)	1.6	(0.8–1.1 cm)
Interventricular septum in systole (IVSs)	1.5	0.6–1.1 cm)
Left ventricular internal diameter in systole (LVIDs)	6.5	(2.0–4.0 cm)
End diastolic volume (EDV)	272	(<150)
End systolic volume (ESV)	216	
Ejection fraction(EF)	20.6	(≥50%)
Fractional shortening(FS)	9.7	(20–45%)
2 Dimesional echocardiogram.	MR, PR	
Doppler study		
Mitral inflow velocity	E wave = 0.97 msec DT = 163 msec	
Aortic flow velocity	A wave = 0.46 DR= 6.25 $msec^2$ E/A Ratio = 2.123 (Restrictive pattern)	

MR= Mitral regurgitation, PR= Pulmonary regurgitation.

In conclusion, acromegaly is an uncommon disease in Nigeria. Although generally acromegalic cardiomyopathies occur, clinically evident heart failure is uncommon. The features of congestive cardiac failure in our patient may be due to late presentation.

REFERENCES

1. Sacca L, Cittadini A, Fazio F. Growth hormone and the heart. *Endocrine Rev*. 1994; 15:555–573.
2. Melmed S, Larry Jameson J. Disorders of the anterior pituitary and the hypothalamus In: Larry Jameson J, et al., eds. *Harrison's Endocrinology.* The McGraw-Hill companies (publishers), 2006. p. 19–56.
3. Bates AS, van't Hoff W, Jones JM, Clayton RN. An audit of outcome of treatment in acromegaly. *Q J Med*. 1993;86:293–299.
4. Orme SM, Mcnally RJ, Cartwright RA, et al. Mortality and cancer incidence in acromegaly: a retrospective cohort study. United Kingdom Acromegaly Study Group. *Clin Endocrinol Metab*. 1998;83:2730–2734.
5. Corville C, Mason WR. The heart in acromegaly. *Arch Int Med*. 1998;61:704–713.
6. Colao A, Marzullo PD, Somma C, Lombardi G. Growth hormone and the heart. *Clin Endocrinol*. 2001;54:137–154.
7. Frustaci A, Chimenti C, Setoguchi M, et al. Cell death in acromegalic cardiomyopathy. *Circulation*. 1999;99:1426–1434.
8. Bertoni PD, Morandi G. Impaired left ventricular diastolic function in acromegaly: an echocardiographic study. *Acta Cardiol*. 1998;42:1–10.
9. Colao A, Cuocolo A, Marzullo P, et al. Impact of patient's age and disease duration on cardiac performance in acromegaly: a radionuclide angiography study. *J Clin Endocrinol Metab*. 1999;84:1518–1523.
10. Colao A, Merola B, Ferone D, Lombardi G. Acromegaly. *J Clin Endocrinol Metab*. 1997;82:2777–2781.
11. Colao A, Baldelli R, Marzullo P, et al. Systemic hypertension and impaired glucose tolerance are independently correlated to the severity of acromegalic cardiomyopathy. *J Clin Endocrinol Metab*. 2000;85:193–199.
12. Damjanovics SS, Neskovic AN, Petakov MS, et al. High output heart failure in patients with newly diagnosed acromegaly. *Am J Med*. 2002;112:610–616.
13. Hayward RP, Emanuel RW, Nabarro JDN. Acromegalic heart disease: influence of treatment of acromegaly on the heart. *Q J Med*. 1987;62:41–58.
14. Rodrigues EA, Caruana MP, Lahiri A, Nabarro JDN, Jacobs HS, Raftery EB. Subclinical cardiac dysfunction in acromegaly: evidence for a specific disease of heart muscle. *British Heart J*. 1989;62:185–194.
15. Kahaly G, Olshausen KV, Mohr–Kahaly S, et al. Arrythmia profile in acromegaly. *Eur Heart J*. 1992;13:51–56.
16. Abs R, Verhelst J, Maiter D, et al. Carbergoline in the treatment of acromegaly: a study in 64 patients. *J Clin Endocrinol Metab*. 1997;82:518–523.
17. Chanson P, Leselbaum A, Blumberg J, et al. Efficacy and tolerability of long-acting somatostatin analogue lanreotide in acromegaly. A 12-month multicenter study of 58 acromegalic patients. *Pituitary*. 2000;2:269–276.

AUTHOR CONTRIBUTIONS

Design concept of study: Anumah, Danbauchi, Garko
Acquisition of data: Anumah, Danbauchi, Garko
Manuscript draft: Anumah, Danbauchi, Garko
Administrative, technical, or material assistance: Anumah, Danbauchi, Garko
Supervision: Anumah, Danbauchi, Garko