

A Rare Case Of Pseudoacromegaly With Insulin Resistance

A Agha, M AlHumaidi, O Isitiyah, A Shehri

Citation

A Agha, M AlHumaidi, O Isitiyah, A Shehri. *A Rare Case Of Pseudoacromegaly With Insulin Resistance*. The Internet Journal of Endocrinology. 2009 Volume 6 Number 1.

Abstract

A 45-year old soldier presented with headache, polyuria and excessive weight gain for many weeks. He also noticed increase in shoe size, tightening of ring around his finger and coarsening of facial features with widening of nose and thickening of lips for last one year. He also complained of backache, electric shock like sensation in gloves and stocking distribution as well as excessive sweating and darkening of her skin in flexural areas. Examination revealed a large framed man with coarse facial features, large hands and feet, acanthosis nigricans and many skin tags. His past medical history was most significant for bilateral carpal tunnel syndrome requiring surgery in last 2 years and type 2 diabetes mellitus which recently was not even controlled on high doses of insulin. His serum insulin like growth factor 1 (IGF-1) and dynamic growth testing was normal. His MRI of pituitary fossa showed no mass while he had normal pituitary hormonal workup. He had marked elevation of fasting serum insulin, and mixed hyperlipidemia. His calculated insulin resistance based on HOMA-IR was very high. Based on negative MRI and clinical and biochemical features of insulin resistance a diagnosis of pseudoacromegaly was made. Pseudoacromegaly is a rare phenomenon that occurs in severe insulin resistance with acromegaloid phenotype in absence of raised growth hormone or IGF-1. Physicians should keep this possibility in mind while evaluating patients with similar clinical and radiological features.

CASE

A 45-year old soldier presented to emergency room with headache and polyuria for last many weeks. He also gives history of increase in shoe size from 43 to 46 and tightening of ring around his finger along coarsening of facial features with widening of nose and thickening of lips all of which he started to notice for the last one year. He also complained of backache, electric shock like sensation in gloves and stocking distribution as well as excessive sweating. His past medical history is significant for long standing gout, hypertension, multiple lumbosacral disc prolapse, bilateral carpal tunnel syndrome and type 2 diabetes mellitus which was previously controlled but for last 6 months is uncontrolled even on insulin 70/30 combination injection 95 units in the morning and 90 in the evening. His other medications included aspirin, atorvastatin, allopurinol and pantoprazole. His past surgical history includes multiple surgeries for carpal tunnel, trigger fingers, patellar surgery and lumbar disc surgery. His family history is positive for diabetes mellitus in both parents as well as in three of his seven siblings.

On examination the patient had prominent jaw and forehead, wide nose, thick lips and stocky hands and feet. (see figure 1 and 2)

Figure 1

Figure 1: Showing prominent lips and coarse facial features of the patient with acanthosis nigricans over ear lobe



Figure 2

Figure 2: Showing coarse hand features with increased soft tissue and thickened digits



He had excessive soft tissue deposition over his head and neck. (see figure 3). His blood glucose was 16.8 mmol/L and he was normotensive and afebrile in the emergency room. He has acanthosis nigricans over ear lobes, back of neck and bilateral axillae. He had decreased sensation to touch and pain over bilateral feet and hands. Other systemic examination was insignificant for any findings.

Figure 3

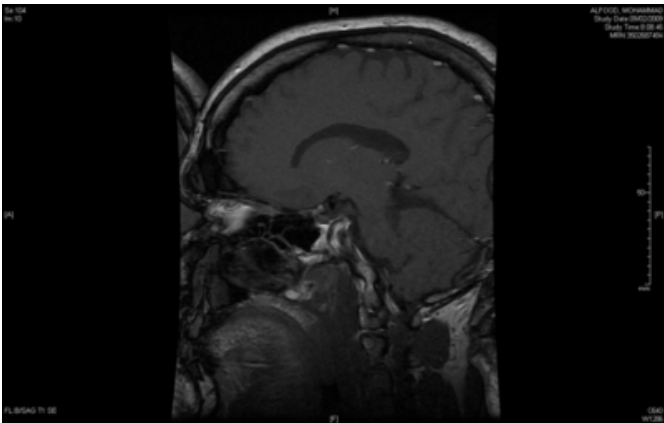
Figure 3: X-ray skull showing prominent soft tissue thickening all around the neck and face



Admitting diagnosis of acromegaly was made for this patient and he was booked for MRI pituitary fossa with gadolinium which showed no pituitary mass/adenoma. (see figure 4)

Figure 4

Figure 4: MRI brain showing normal pituitary fossa



His HbA_{1c} was 11.1 and Insulin like growth factor was normal. A dynamic growth hormone testing was done which was normal while the serum fasting insulin was raised presence of insulin resistance based on HOMA-IR (see table 1). Based on negative MRI and clinical and biochemical features of insulin resistance a diagnosis of pseudoacromegaly was made. The patient was put on pioglitazone and metformin and premeal 20 units regular insulin subcutaneously thrice a day. After 3 months on follow-up the patient blood glucose was much controlled and his HbA_{1c} had improved to around 8.3

Figure 5

Table 1: SUMMARY OF PERTINENT LABORATORY INVESTIGATIONS

Labs	Results	Normal values	
Growth hormone 8 AM	3.1 IU/L	Up to 10 IU/L	
IGF-1	87 ng/ml	116-341 ng/ml	
IGF binding protein 3	2260 ng/ml	3500-7900 ng/ml	
Fasting insulin	71.8 uU/ml	3.0-25.0 uU/ml	
HOMA-Insulin resistance	12.5	1-4	
OTHER PERTINENT LABS			
Triglycerides mmol/l	3.5	ALT IU/l	44
Cholesterol mmol/l	5.6	AST IU/l	32
HDL mmol/l	0.8	Urea mmol/l	7.4
LDL mmol/l	2.6	Creatinine mmol/l	98

REVIEW OF LITERATURE

Pseudoacromegaly is a rare disorder characterized by tissue overgrowth and acromegaloid features in the absence of growth hormone or IGF-1 oversecretion.¹ it is characterized by very high levels of serum insulin which probably provides the stimulus for abnormal tissue growth. The first case of pseudoacromegaly was described by Flier et al and found resistance to insulin-mediated glucose disposal in the patients cultured fibroblasts.¹ To-date there have been six cases reported with this rare condition.²⁻⁶ it has been postulated that excessive acral growth and changes in the

composition of tissues such as fat and muscle are due to supraphysiological insulin levels providing stimulus to growth through an intact mitogenic signaling pathway. One of the studies have shown selective impairment of phosphoinositide-3-kinase activation by insulin in this disorder.² Since the proposed mechanism for pseudoacromegaly in these patients clearly differs from normal mechanism for acromegaly (IGF-1 acting through IGF-1 receptors), such patients mimick the acromegaloid phenotype but usually do not have the classic presentation of acromegaly.

CONCLUSION

Insulin-mediated pseudoacromegaly is an rare syndrome consisting of insulin resistance associated with acromegaloid phenotype. A selective post receptor defect causes impaired insulin signaling for metabolic effects but there is preservation of mitogenic signaling, resulting in abnormal tissue growth and acromegaly like features in affected patients. Physicians should consider this possibility while

evaluating patients with similar clinical and laboratory features.

References

1. Flier JS, Moller DE, Moses AC, et al. Insulin-mediated pseudoacromegaly: clinical and biochemical characterization of a syndrome of selective insulin resistance. *J Clin Endocrinol Metab.* 1993;76:1533-41
2. Dib K, Whitehead JP, Humphreys PJ, et al. Impaired activation of PI 3-kinase by insulin in fibroblasts from patients with severe insulin resistance and pseudoacromegaly. *J Clin Invest.* 1998; 101:1111-20
3. Kausch C, Bergemann C, Hamann A, et al. Insulin mediated pseudoacromegaly in a patient with severe insulin resistance: association of defective insulin-stimulated glucose transport with impaired PI 3-kinase activity in fibroblasts. *Exp Clin Endocrinol Diabetes.* 1999;107:148-54
4. Kumar S, Durrington PN, O'Rahilly S, et al. Severe insulin resistance, diabetes Mellitus, hypertriglyceridemia, and pseudoacromegaly. *J Clin Endocrinol Metab.* 1996; 81:3465-8
5. Friskin JE, Eastman RC, Leonia MA, et al. Specificity spillover at the hormone receptor-exploring its role in human disease. *N Eng. J. Med.* 1989; 320:640-5
6. Yaqub A, Yaqub N. Insulin-mediated pseudoacromegaly: a case report and review of the literature. *W V Med J.* 2008;104:12-5.

Author Information

Adnan Agha

Department of Internal Medicine, Armed Forces Hospital Southern Region

Mohammad Awad AlHumaidi

Department of Internal Medicine, Armed Forces Hospital Southern Region

Osama Isitiyah

Department of Internal Medicine, Armed Forces Hospital Southern Region

Ali Shehri

Department of Internal Medicine, Armed Forces Hospital Southern Region