ORIGINAL RESEARCH PAPER

Dermatology

KEY WORDS: Acanthosis nigricans, Metabolic Syndrome, Insulin Resistence.

A STUDY ON THE CLINICO-EPIDEMIOLOGICAL PATTERN OF ACANTHOSIS NIGRICANS AND IDENTIFICATION OF METABOLIC SYNDROME IN THEM

Ananthi M Assistant Professor, Department of Dermatology, Government Villupuram Medical College and Hospital. Tamilnadu. India

Tharini G.K Associate Professor. Government Omandurar Medical College and Hospital, Tamilnadu. India. Corresponding Author

Suganthy V Assistant Professor, Department of Dermatology, Government Villupuram Medical College and Hospital. Tamilnadu. India

ABSTRACT

Introduction: Acanthosis nigricans(AN) is an easily identifiable skin lesion characterized by velvety, brownish- black pigmentation of the neck and intertriginous surfaces. The most common cause for AN is insulin resistence(IR).IR plays a major role in the pathogenesis of metabolic syndrome(MS).So patients with AN are at increased risk for MS.

Material and Methods: This study was a prospective cross sectional study conducted at skin department at Government Villupuram Medical College(GVMCH), Tamilnadu during the peroid May 2016 to October 2016 .The objective of this study was to find the clinico-epidemiological pattern of AN and to identify MS in them. All newly diagnosed patients of AN were included, examined and investigated for underlying problems and MS was diagnosed using revised ATP111 criteria for Asian populaion .

Result and Conclusion:75 patients were enrolled with 72(96%) less than forty yrs of age. Females constituted 58(77%) and male 17(23%).All patients(100%) had neck involvement.5 patients of hypothroidism,3 patients of HAIR-AN syndrome with polycystic ovaries and 1 patient of Lipodystrophy were identified. About 25(38%) of adult AN fulfilled the criteria for MS. Hence we conclude all patients must be investigated for underlying problem and AN serves as an easy screening tool for metabolic syndrome.

1. Introduction

Acanthosis nigricans(AN) is an easily identifiable skin lesion characterized by velvety ,brownish-black pigmentation of the neck and intertriginous surfaces. Typical areas of involvement include the posterior aspect of the neck, axillae, elbow and knees; the neck is involved 93%to99% of the time[1,2]. The most common cause for AN is insulin resistence. A number of studies have shown an association between AN and insulin resistence(IR)[3,4].Benign AN occurs in association various endocrine disorders and syndromic AN is associated with type A and type B syndromes. Metabolic syndrome(MS) refers to a clustering of metabolic risk factors including central obesity, glucose intolerance ,hyperinsulinemia ,low HDL cholestrol, high triglycerides and hypertension[5]. Insulin resistence plays a major role in the pathogenesis of metabolic syndrome. Patients with AN are at risk for all components of the metabolic syndrome. Hence this study was conducted to see the clinico-epidemiological pattern of acanthosis nigricans and presence of metabolic syndrome in AN patients attending our skin out patient department(OPD) at Government Villupuram Medical College and Hospital.

2. Material and Methods

This is a non interventional cross sectional study conducted in skin OPD at GVMCH during the peroid May 2016 to October 2016.

Inclusion criteria:1)All newly diagnosed patients of AN. 2)All adult AN patients for identification of metabolic syndrome.

Exclusion criteria:1)All pregnant mothers.

All patients were clinically diagnosed to have AN and biopsy was performed when the diagnosis was doubtful. Ethical approval for the study was obtained from the ethical committee of GVMCH. The purpose of the study, the examination and investigations to be carried out were explained to the individuals prior to obtaining informed written consent. Consenting patients were screened by a structured interview, basic demographic data ,detailed history on duration of the lesion ,family history of similar complaint were asked for. Thorough clinical examination was done and site of AN were noted. Detailed history of drug intake was noted. Anthropometric measurements like height, weight, waist circumference were taken. Blood pressure was recorded and all patients were subjected to lab investigation for blood sugar, lipid profile and thyroid profile. Menstrual history was taken for all female patients and those with irregular peroids were subjected to ultrasound pelvis to detect polycystic ovaries. From all the above data Metabolic syndrome was diagnosed based on revised ATP111 criteria for Asian populaion[6].

CLINICAL IDENTIFICATION OF METABOLIC SYNDROME--ANY 3 OF THE FOLLOWING	
1)Abdominal obesity	Waist circumference
men	>102 cm(40 inch)
women	>88cm(35 inch)
2)triglyceride	150mg/dl
3)HDL cholestrol	
men	<40mg/dl
women	<50mg/dl
4)blood pressure	130/85mmHg
5)fasting blood sugar	110mg/dl

All data were compiled tabulated and analysed.

3. Results

In our study, 75 patients with AN were enrolled. The study group had age distribution of about 72 (96%) less than40 yrs of age, among which10 (13%) belonged to pediatic age group .There were only 3(4%) patients above the age of 40.Maximum belonged to adolescent age group26(35%) and early adulthood 29(39%) Though we had 3(4%) AN patients above 40 yrs we could not identify any underlying focus of malignancy in them.

It had a sex distribution of about 58 (77%) female and 17 (23%) males. The mean duration of presence of AN in our group was 2yrs with a range of 1 month to 12 yrs. All our AN patients had more than one site of involvement and neck was involved in 100 percent of our patients.15(20%) had positive history of AN in their family. 5 patients were newly diagnosed to have hypothroisism,3 were diagnosed to have HAIR-AN syndrome who also had polycystic ovaries. we had one patient with Lipodystropy. Based on revised ATP111 criteria for Asian populaion about 25(38%) out of 65(excluding pediatric age group) were newly diagnosed to have metabolic syndrome .

Figure 1 LIPODYSTROPHY

Figure 2 HAIR-AN SYNDROME

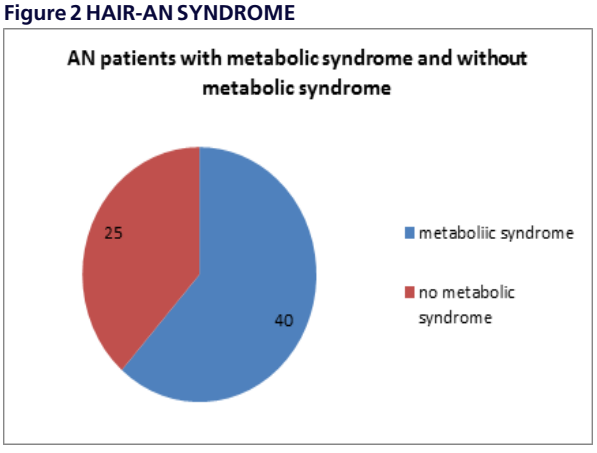

Chart 1

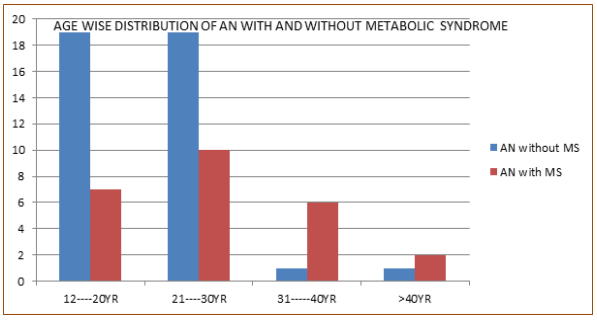

Chart 2

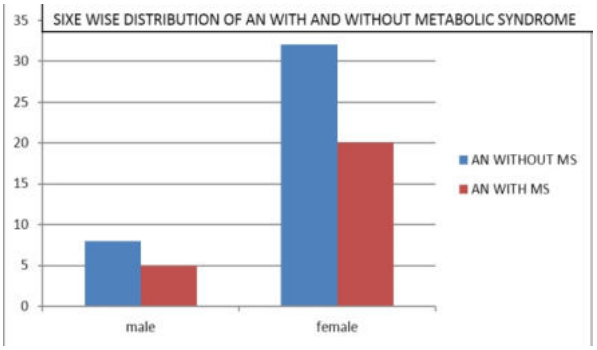

Chart 3

4. Discussion

Acanthosis nigricans(AN) is a skin condition characterized by abnormally increased coloration (hyperpigmentation) and velvety thickening (hyperkeratosis) of the skin particularly of skin fold regions, such as of the neck and groin and the arms(axillae). It typically occurs in individual younger than age 40, may be genetically inherited and it is associated with obesity or endocrinopathy such as hypothyroidism, acromegaly, polycystic ovary disease, insulin- resistent diabetus and cushing disease[5]. In our study 72(96%) were less than 40 yrs of age of which 10 (13%) belonged to pediatric age group. Only 3(4%) were above 40yrs of age. AN in individuals older than age 40,this disorder is commonly associated with an internal malignancy[6]. Involvement of mucous membrane is rare and suggests a coexisting malignant condition[6]. In our study group neither could we identify underlying focus of malignancy in the patients above 40 yrs nor did we see mucousal involvement in any of our patient . AN has no known sex predilection[7]. Our study group had 58(77%) females and 17(23%) males. This is consistent with most of the studies conducted on AN ,the most probable reason being it is more of a cosmetic concern for the females and so they seek medical advice more than males. We also find in literature that typical areas of involvement includes the posterior aspect of the neck, axillae, elbow and knees; the neck is involved 93% to 99% of the time[1,2].This is consistent with our study which showed that all patients had more than one area of involvement and 100 percent of our patients had neck involvement. As this being an easily visible site ,this can be used as a simple easy way to look for AN by Dermatologist as well as by paramedical staffs. The average duration of AN prior to diagnosis has been 2 yrs in our study with a range from 1 month to 12 years. Familial AN may rise as a result of an autosomal dominant trait, presenting at birth or developing during childhood[7]. In our study 15(20%) had family history of AN and all of them belonged to adolescent age group. AN may also be seen with certain medication that lead to elevated insulin levels e.g., glucocorticoids, niacin, insulin, oral contraceptives and protease inhibitors[8].We did not see any drug induced AN in our study group. AN may occur in Addisons disease, Stein- leventhal syndrome, Leprechaunism, Pinealoma, lipodystrophy and Gigantism[8]. Our study group had one AN patient with lipodystrophy. This patient born out of a consanguineous marriage had features of loss of subcutaneous fat, raised blood sugar and triglycerides Congenital generalized lipodystrophy is an extremely rare autosomal recessive condition which manifests with insulin resistence, absence of subcutaneous fat and muscular hypertrophy[9]. Benign AN occurs in association with various endocrine disorders[8]. In our study group on evaluating we could identify 5 new cases of hypothyroidism and were started on treatment. Syndromic AN includes type A and type B syndrome. The type A syndrome consists of hyperandrogenemia, insulin resistence, and AN syndrome(HAIR-AN syndrome) and type B consist of AN with hyperandrogenemia and auto immune disorders[8] . we had 3 patients of HAIR -AN syndrome in our study group who also had polycystic ovaries . Metabolic syndrome(MS) refers to a clustering of metabolic risk factors including central obesity, glucose intolerance, hyperinsulinemia, low HDL cholestrol, high triglyceride and hypertension[5].IR appears to be the most likely underlying mechanism in metabolic syndrome. AN is an easily identifiable skin lesion and it is associated with insulin resistence. AN has been shown to be a reliable cutaneous marker of insulin resistence in obese Japanese children[10] .In a recent study in the USA,49% of 676 fifth grade children with AN fulfilled criteria for metabolic syndrome[11].Some studies in the USA have encouraged their doctors to look for AN in their children in order to detect those in high risk of developing diabetus mellitus[12].Several recent studies recommend the use of AN as a marker of insulin resistence in American Indian children[13].Based on revised ATP111 criteria for diagnosis of MS in Asian populaion, about25(38%) of 65 (excluding pediatric age group) of AN patients were newly diagnosed to have metabolic syndrome in this study group. They were referred to medical OPD for management of hypertension ,raised blood sugar and deranged lipid profile. At present the Government of India is conducting a wide spread screening program for detection of non communicable diseases like hypertension and diabetus for all individual above 30 yrs of age. As from our study and various other studies it has been show that AN serve as a cutaneous marker for metabolic syndrome and as its easily identifiable and occurs mostly in neck, this can be used as tool for screening metabolic syndrome. Though some patients have not fulfilled all the criteria for diagnosis of metabolic syndrome, they have to be on peroidical follow up and a more sensitive test for detecting insulin resistence for those who have not developed overt metabolic syndrome would be estimation of

plasma insulin level as all these patients will be having a high plasma level[14].

5. Conclusion

AN is an easily identifiable condition and occurs at the visible sites making it to be readily diagnosed by Dermatologist as well as by paramedical staffs. AN serves as a cutaneous marker for many underlying endocrine disorders and can be used as an useful screening tool for metabolic syndrome.

we emphasis the need for proper examination and evaluation of all patients of AN, as in most of the cases AN resolves if underlying condition is treated.

REFERENCES

1. Burke JP, Hale DE, Hazuda HP, Stern MP.A quantitative scale of acanthosis nigricans. diabetes care.1999;22(10):1655-9.
2. Stuart CA, Gilkison CT, Smith MM, Bosma AM, Keenan BS, Nagamami M .Acanthosis nigricans as a risk factor for non-insulin dependent diabetus mellitus. clin pediatr(phila) 1998;37(2):73-9.
3. Stuart CA, Smith MM, Gilkson CR, Shaheb S, Stahn RM. Acanthosis nigricans among native Americans: An indicator of high diabetes risk. Am J public health.1994;84:1839-42.
4. Gilkson C, Stuart CA. Assessment of patients with acanthosis nigricans skin lesion for hyperinsulinaemia , insulin resistence and diabetes risk. nurse pract. 1992;17:26-44.
5. Expert panel on detection, evaluation and treatment of high blood cholestrol in adults (may 2001). Executive summary of the third report of the national cholestrol education program(NCEP) expert. JAMA: The Journal of the American Medical Association.
6. Fan JG, Saibara T, Chitturi S. Asia-Pacific working party for NAFLD. What are the risk factors for non-alcoholic fatty liver disease in Asia-Pacific. J Gastroentrol Hepatol.2007;22:794-800.
6. James,William;Berger,Timothy;Elston,Dirk(2005).Andrews disease of the skin: clinical dermatology.(10th ed.).Saunders.
7. Sinha S, Schwartz RA. Juvenile Acanthosis nigrican.J Am Acad Dermatol.2007;57(3):82-8
8. Habif , Thomas P.(2009).Clinical dermatology(5th ed).Edinburgh: mosby. ISBN 978-0-7234-3541-9.
9. Friguls B; Coroleu W; Del Alacazar R; Hilbert P; et al.(2009).Severe cardiac phenotype of Berardinelli- Seip congenital lipodystrophy in an infant with homozygous E189XBSCL2 mutation. Eur J Med Genet. 52(1):14-6.
10. Yamazaki Ito S, Yoshida H, Acanthosis nigricans is a reliable cutanous marker of insulin resistence in obese Japanese children. Paeditr Int. 2003;45:701-705.
11. Murphy E, Minor VE, Neal WA. Metabolic syndrome in fifth grade children with acanthosis nigricans. world J paediat.2009; 5:23-30.
12. Jones LH,Ficca M.Is Acanthosis nigricans a reliable indicator for risk of type 2 diabetes? J Sch N. 2007;23:23-30.
13. Stoddast ML, Blevins KS, Lee ET, Wang W, Blackett PR. Association of Acanthosis nigricans with Hyperinsulinaemia compared with other selected risk factor for type 2 diabetes in Cherokee Indians. diabetes care. 2002;25(6):1009-1014.
14. Miller JH, Acanthosis nigricans. Medscape(cited 2012 Nov 28). Available from: http:// emedicine amaedscape.com/article/1102488-overview.