Journal of Pakistan Association of Dermatologists. 2023;**33(3)**:935-942.

Original Article

A clinico-epidemiological study of acrochordons and their association with metabolic syndrome

Nisha Agrawal, Prabal Samanta*, Kingshuk Chatterjee, Jayanta Kumar Barua*, Gautam Banerjee***

Department of Dermatology, JIS School of Medical Sciences & Research, India.
* Department of Dermatology, School of Tropical Medicine, Kolkata, India.
** Department of Dermatology, NRS Medical College, India.

Abstract

Objective Achrochordons (Skin Tags) are common benign tumours occurring in skin of the neck and flexural regions of the body. They most commonly occur in middle age and old age population ranging from size of 1mm to 2-3cm in diameter. The middle aged population most commonly seek treatment and older people generally leave it attended. Cosmesis is the most common reason for treatment, but they may sometimes cause chronic irritation due to pressure effect or repeated friction. They can be multiple morphologies likel filliform, pedunculated, sessile etc. They can be pigmented or of skin colour as well. They don't have any gender-predilection. Metabolic syndrome is a curse of modern time. Genetic as well as lifestyle has been implicated for the same. Diagnosis involves presence of 3 or more out of Hyperglycemia, Hypertriglyceridemia, Decreased HDL Cholesterol levels, Central obesity and Hypertension, according to guidelines laid by NCEP ATP III guidelines. Skin Tags is associated with the Metabolic syndrome in a significant number of population. The co-existant population may have clinical manifestation of Metabolic syndrome or may be having subclinical disease. So the presence of Skin Tag can be used to screen patients for metabolic syndrome and may aid in the detection of the subclinical cases as well. Early initiation of lifestyle modification and therapy if required, may significantly decrease the morbidity associated with the chronic disease. Hence it is advisable to be vigilant in patients of Skin Tags, particularly in patients having more than 5 skin tags, and investigate them for Metabolic syndrome so that we detect and treat them early.

Key words
Acrochordon; Skin tag; Metabolic syndrome; Diabetes mellitus; Obesity.

Introduction

Acrochordons are benign lesions of the skin which are composed of loose connective, fibrous tissue and they mainly occur on the major flexures of the body as small and soft pedunculated masses. They are also known synonymously as fibroepithelial polyp or soft warts. They are more common with increasing age. They may have a relationship with obesity, cardiovascular disorder, diabetes mellitus, abnormal lipid profile etc. They have a prevalence of around 46% in the world. Patients thus should be counseled that these lesions are of benign nature. The lesions are generally pedunculated. They have an average diameter of 2mm but can be as large as 5 cm. They may be skin coloured or hyperpigmented. Small, sessile Seborrheic keratosis may also be present in association. Melanocytic naevus, neurofibromas come under the differential diagnoses. Occasionally, they can twist on the pedicle and become inflamed. Birt Hogg Dube Syndrome is a rare autosomal dominant disorder in which

Address for correspondence
Dr. Nisha Agrawal
Assistant Professor,
Department of Dermatology,
JIS School of Medical Sciences & Research,
India.
Email: 160nisha@gmail.com

there are numerous trichodiscomas and fibrofolliculomas. The trichodiscomas generally resemble morphologically skin tags. Basal Cell Carcinoma has a subtype called Fibroepithelioma of Pinkus, which generally presents as pink acrochordon like mass on the lower part of the back.

Histopathologically, the epidermis is attenuated, stratum basale is flattened and there is mild hyperkeratosis. There are thick and thin walled blood vessels in the dermal stroma. It is composed of loose fibrous tissue in the dermis. Proliferation of melanocytes and naevus cells are generally not seen, and they probably come under the spectrum of seborrheic keratosis.

Perianal skin tags can result from thrombosed external haemorrhoids. In contrast to external haemorrhoids, they do not swell with blood when the patient strains or reduce with pressure. They are usually asymptomatic but large or multiple lesions can interfere with personal hygiene and can cause perianal dermatitis.

Syndrome X is also called as Metabolic Syndrome which is a multifactorial disease having numerous risk factors. It is accompanied by abnormal adipose deposition and function and alongwith it comes insulin resistance.

American Heart Association and National Heart, Lung and Blood Institute (NHLBI) have made guidelines for metabolic syndrome in which at least 3 out of 5 parameters must be met:

1. Fasting sugar ≥100mg/dl (or receiving drug therapy for the same).
2. BP≥130/85mm Hg (or receiving drug therapy for the same).
3. Triglycerides ≥150mg/dl (or receiving drug therapy for the same).
4. HDL-C < 40mg/dl for men or < 50mg/dl for women (or receiving drug therapy for the same).
5. Waist circumference ≥102 cm (40 in) for men or ≥88 cm (35 in) for women, in case of Asian American, ≥90cm (35 in) for men or ≥80cm (32 in) for women.

Clinical manifestations of metabolic syndrome may manifest as increased blood pressure, increased blood glucose, increased lipid profile, retinopathy, peripheral neuropathy, hirsutism, acanthosis nigricans, obesity, chest pain or difficulty of breathing. In patients of severely deranged lipid profile, xanthomas and xanthelasmas can occur. Weight loss, regular exercise, dietary modifications and lifestyle changes are the most important steps in combating metabolic syndrome. Statins, niacin, fenofibrates, omega-3-fatty acids and insulin-sensitising agents fall under the armamentarium of drugs.

The patient generally seeks treatment for skin tags due to cosmetic reasons. Or if the lesion is causing irritation or pain due to friction with opposing skin surfaces or clothing. Snip excision, cautery and cryotherapy all are effective. Topical retinoid like all-trans-retinoic acid (tretinoin) can be used for smaller lesions.

Aims and Objectives

1. To study the clinical and epidemiological profile of acrochordons.
2. To estimate the relationship between acrochordons and metabolic syndrome.

Methods

The study was conducted at the Department of Dermatology in a tertiary care hospital of Eastern India. It is an institution based observational, cross sectional study which was performed over a time span of 12 months starting from July 2021 till June 2022. 106

patients with skin tags were taken as the study population.

Inclusion criteria 1) Patients with primary complaint and clinical diagnosis of skin tags. 2) Those who are willing to participate in the study.

Exclusion criteria 1) Pregnant women 2) Severely ill people. 3) Patients unwilling to participate in the study.

We determined the various epidemiological and clinical profile of skin tags as study parameters in terms of age and gender, size and number. Metabolic syndrome was evaluated by taking height, weight, lipid profile, FBS, blood pressure, waist circumference and BMI. Descriptive data was represented as mean or percentages. Data collected was tabulated, checked for completeness and then statistically analysed using appropriate software.

Results and Analysis

Out of the study population of 106 patients attending the Dermatology OPD with primary clinical diagnosis of Acrochordons, of which 46% were females and 54% males. Majority of patients were of the age interval 31-40 years (39%) followed by 41-50 years (33%). Hence 75% of cases were between 31-50 years, i.e. middle age group patients. Acrochordons were found to be less common in patients age less than 20 years and above 60 years of age. It was noted that 7% patients had less than 5 Acrochordons whereas 44% of them had 5-10, 38% had 11-15 and more than 15 Acrochordons was seen in 11% of the patients.

Acrochordons were most commonly located in the neck region. 82% of the patients had Acrochordons in neck. Axilla was the 2nd most common site with 32% of the patients having lesions in axilla.14% and 13% of patients had skin tags around the inguinal region and eye

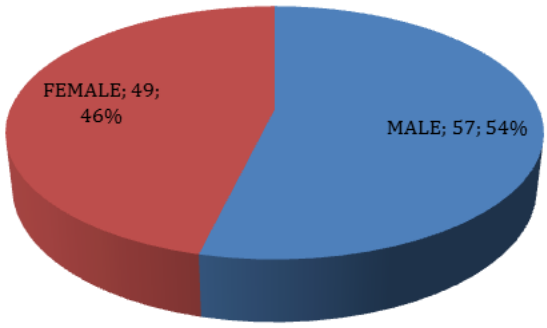

Figure 1 Gender distribution of the study cases.

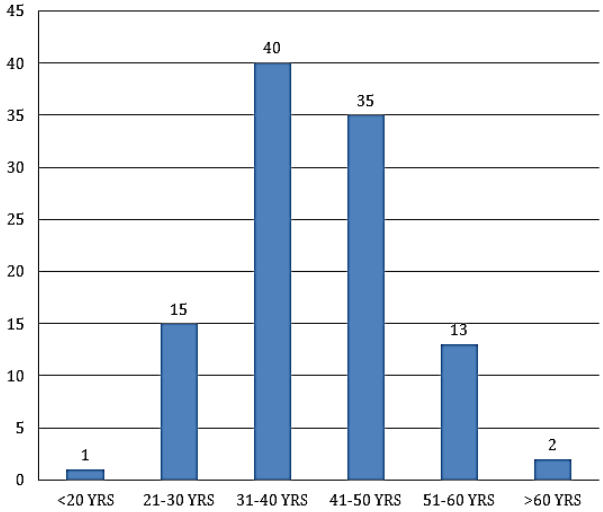

Figure 2 Age distribution of the study cases.

respectively. Skin tags in perineal region was noted in 3% patients. 31 patients had Metabolic syndrome in accordance to NCEP ATP III Guidelines. 75 patients didn't fit 3 out of 5 criteria for metabolic syndrome. 43% patients had deranged glycemic status.57% of patients had normal glycemic status. The odds ratio of having deranged glycemic status was 1:1.4 in comparison to having euglycemic status. Serum triglyceride was elevated (≥150 mg/dl or specific medication for hypertriglyceridemia) in 50 patients out of 106. So in the study, association of hypertriglyceridemia was a more common occurrence than hyperglycemia (48% for hypertriglyceridemia and 43% for hyperglycemia). Out of 106 patients of skin tags 36 patients had deranged HDL-Cholesterol level. 70 patients had normal HDL Cholesterol

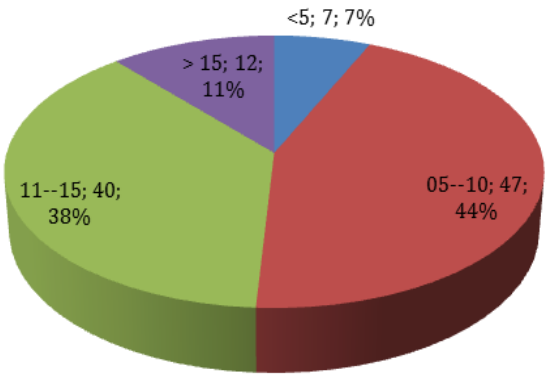

Figure 3 Distribution of no. of skin tags in the study cases.

levels. Central obesity was noted in 24 out of 106 subjects. 82 patients had waist circumference less than the defined values for central obesity. 37% of the study population were hypertensive. 63% patients had Blood Pressure values less than 130/85.

Discussion

The conducted study had 106 patients out of which 46.2% and 53.7% were females and males respectively. No particular sex predilection is present for Acrochordons according to literature. Consecutive purposive sampling was done for the study and no particular gender preponderance was noted as well. 72% of cases were between 31-50 years, i.e. middle age group patients. 39% and 33% patients were of age interval of 31-40 years and 41-50 years respectively. Acrochordons were found to be less common in patients less than 20 years and above 60 years of age. Shrestha *et al.* report maximum preponderance in the age group >55 years (37.5%) followed by 45-54 years (35%). Shah *et al.* had the mean age group of patient as 54years. 42% patients had 5-10 Acrochordons on their body. 36% of the patients had 11-15 Acrochordons whereas 11% had more than 15 Acrochordons and 6.6% had less than 5 Acrochordons. Hence it was noted that almost 78% of patients had 5-15 Acrochordons.

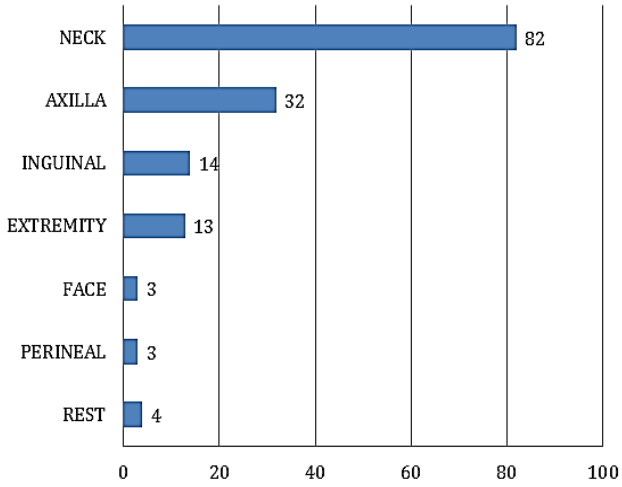

Figure 4 Site wise distribution of the Acrochordons.

Shrestha *et al.* revealed showed that 49% of patients had 5-10 Acrochordons of their body and 43% patients had less than 5 skin tags. Study by R Shah, and El Safoury showed no difference in gender in the mean number and frequency of Acrochordons. Acrochordons were most commonly located in the neck region. 82% of the patients had Acrochordons in neck. Axilla was the 2nd most common site with 32% of the patients having lesions in axilla. 4% and 13% of patients had skin tags around the inguinal region and eye respectively. Skin tags in perineal region was noted in 3% patients. Studies by Jindal *et al.* and Norris showed that Acrochordons were most frequent in neck with a frequency of 42% and 64% respectively. In the entire study population, 31 patients had metabolic syndrome in accordance to NCEP ATP III Guidelines, while 75 patients did not fit 3 out of 5 criteria for syndrome X.

Thus the prevalence of the syndrome X was 29.24% in our study. The Pearson coefficient came out to be 1.38. 7% of patients with positive metabolic syndrome had 5–10 Acrochordons on their body followed by those with 11-15 Acrochordons (32.3%). 22.6% patients with positive metabolic syndrome had more than 15

Figure 5 Multiple filiform and pedunculated achrochordons in neck.

Figure 6 Pigmented Acrochordons in axilla.

Figure 7 Pedunculated Acrochordons from eyelid.

Figure 8 Acrochordons in upper thigh.

Figure 9 Large pedunculated Acrochordons from perineum.

Figure 10 Pedunculated Acrochordons from penis.

Acrochordons on them. However, no significant association was found between number of acrochordons and positive metabolic syndrome (p=0.224). Both gender and age were also not found associated with positive metabolic syndrome. Sari *et al*. and Akpinar *et al.* reported the frequency of Metabolic Syndrome as 39.3% and 56.2%. The difference can be due to different ethnicity and hence genetics of the study population, the age distribution of the study population or the criteria used for diagnosis. In the study, 42.4% patients had deranged glycemic status. 57.6% of patients were Euglycemic. Patients with 11–15 skin tags constituted 40% of the glycemic population, while 33.3% of the glycemic population had 5-10 skin tags each.24.4% of glycemic patients had more than 15 skin tags. Significant association was found between number of skin tags and deranged glycemic level. (Pearson's correlation, r=0.188) (Significance, p=0.054) (p<0.05). The findings of this current study are partly in tandem with previous studies. Margolis reported that 72.3% with skin tags had overt Diabetes while IGT was found in 12.7% cases. Patients having acanthotic, multiple and bilateral lesions were more prone to have develop Diabetes Mellitus. Kahana *et al*.[1] noticed IGT in 34.3% of cases with skin tags. No correlation between the location, morphology and number of skin tags with glycemic status could be established. Norris *et al*. suggested that skin tags correlated higher with state of hyperinsulinaemia than the state of glycaemia. Agarwal and Nigam[2] reported the frequencies of overt Diabetes and IGT as 30.5% and 10.1% respectively; in patients with skin tags. Hence 40.6% patients had deranged glycemic status. Demir *et al.* found that 73.3% patients with Acrochordons were Diabetic with neck as the most common location for Diabetes Mellitus. Bhargava *et al*.[3] reported that multiple number of skin tags (>2) imply a considerable risk for the onset of Diabetes mellitus. Their sites were also deemed significant risk factor for the development of Diabetes. Rasi *et al*.[4] found a positive correlation between the total number of skin tags and fasting blood glucose in a case control study. Net 24 patients in Skin tags group were detected to have overt diabetes in their.

Figure 11 Giant pedunculated Acrochordons in neck region.

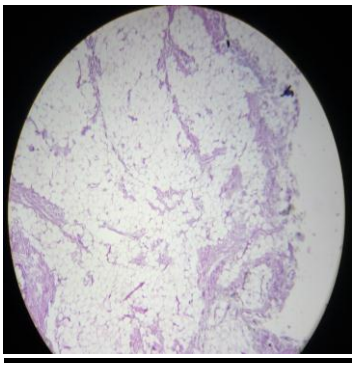

Figure 12 Histopathology of Acrochordon.

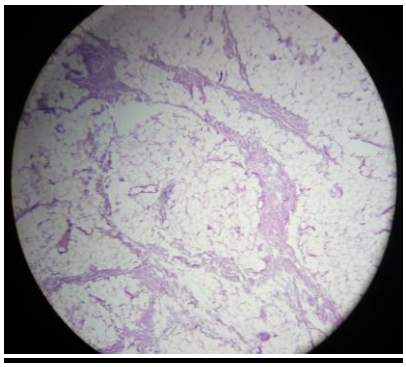

Figure 13 Histopathology of Acrochordon.

study. In the study population, Serum triglyceride was elevated (≥150 mg/dl or specific medication for hypertriglyceridemia) in 50 patients out of 106 (47%). 42% of patients with positive metabolic syndrome had 11-15 Acrochordons on their body followed by those with 5–10 Acrochordons (34%). 18% patients with positive metabolic syndrome had more than 15 Acrochordons on them. However, non-significant association was found between number of acrochordons and deranged triglyceride level. (Pearson's correlation, r=0.097) (Significance, p=0.323). Out of 106 patients of skin tags 36 (33.9%) patients had deranged HDL-Cholesterol levels. 70 (66%) patients had normal HDL Cholesterol levels. However, non-significant association was observed between number of acrochordons and deranged HDL level. (Pearson's correlation, r=-0.056) (Significance, p=0.570). Only few reports are available in the literature finding out the relationship of lipid profile and hypertension in patients with skin tags. Gorpelioglu *et al.* showed higher values of total and LDL-cholesterol while Erdogan *et al.* found out higher total cholesterol levels in cases, compared with the controls. The frequency of dyslipidemia was established at 45.8% and 59.3% in patients with skin tags by Gorpelioglu and Erdogan respectively. Crook found out that an increased lipid profile, higher blood triglyceride level and decreased HDL cholesterol in a small participant group was related with formation of skin tags. In our study, we found that 50 (47.2%) patients and 36 (33.9%) patients had deranged Triglyceride and HDL-Cholesterol status respectively. The prevalence of hypertriglyceridemia was more than hyperglycemia in the study population (47.2% in comparison to 42.4%). Central obesity was noted in 24 (22.6%) out of 106 subjects.82 (77.3%) patients had waist circumference less than the defined values for central obesity. However, significant association was detected between number of acrochordons and waist circumference. (Pearson's correlation, r=0.241) (Significance, p=0.013). Obesity plays an important role in the development of metabolic syndrome as it leads to a state of Resistance to Insulin. The state of Resistance to Insulin leads to increase in IGF-1 and EGF receptors. Increased expression of EGF receptor leads to formation of Acrochordons. Our study had 37(34.9%) hypertensive out of 106 patients as per defined values. 65.1% patients had Blood Pressure values less than 130/85. However, non-significant association was found between number of acrochordons and hypertensive status. (p=0.962).Sari *et al*. found out higher SBP, DBP and MBP in patients acrochordons. 30.1% of patients were found to be hypertensive. Akpinar *et al*.[5] and Demir *et al*.[6] found out 52% and 65% of patients with skin tags had high blood pressure respectively. Among the 106 subjects in our study, 37 patients (33%) were hypertensive.

69(66.49%) patients had Blood Pressure values less than 130/85.

No correlation amongst the localisation of skin tags and impaired glucose tolerance has been established barring acrochordons under breast in women in a study by Sari *et al*.[7] In a reasearch conducted by Maluki *et al.*, patients with acrochordons showed considerably greater values of Body mass Index, blood pressure, and circumference of the waist. It is observed that 37 out of 50 patients (72.5%) fulfilled at least three criteria of Syndrome X.[8] In a research conducted by Sudy *et al.* eight or more skin tags have relation to basal and post-prandial hyperglycemia. Patients with more than 30 acrochordons were specifically at a greater risk of impaired glucose tolerance.[9] In a study conducted by Tamega *et al;* it was seen that skin tags were associated with triglycerides, Body mass Index, hip and waist ratio and Diabetes Mellitus.[10] In studies conducted by Gorpelioglu *et al;* higher titres of total cholesterol and LDL-cholesterol were found while Erdogan *et al;* found out higher cholesterol levels in patients relative to the controls. Frequency of dyslipidemia was reported at 45.8% and 59.3% in patients with Acrochordons respectively.[11,12] According to El Safoury et al and Nicholas Angelopoulos *et al;* it is reported that Insulin and IGF-1 levels may have a role in the etiogenesis of Skin tags and Acanthosis Nigricans beacause of their differentiating and proliferative properties.[13,14]

This study had its limitations as well. We had a limited sample size. So, the findings of our study are difficult to extrapolate to the wider, general population. It was a consecutive purposive sampling; on the basis of resources present. Randomisation would have added more value to the study. The study shows the association, but could not estimate the strength of association for which case control/analytical studies are required. Thus, the study should form the basis of further research.

Conclusion

The present study was mainly conducted to find out the clinical profile of skin tags and show its correlation with different parameters of Metabolic syndrome. In our study, we had 106 patients out of which 54% were females. Majority of the patients, 40 were in the age interval of 31-40 yrs. 44% of the cases had between 5-10 Acrochordons while only 7% had less than 5. The neck was the most common location for acrochordons which was present in 82% of the cases, it was followed by the axilla in 32% cases. Metabolic syndrome was present in 71% of the cases while 43% had deranged glycemic status. 48% had deranged triglyceride levels while 34% had low levels of HDL-Cholesterol compared to the normal levels. 24% of the patients were obese while 37% were hypertensive. We have compared and correlated our study findings with those found in previous studies. We hope that our study will provide further encouragement to carry out further such similar studies showing the link between metabolic syndrome and skin tags and the related acanthosis nigricans with a larger sample size and study population.

References

1. Kahana M, Grossman E, Feinstein A, Ronnen M, Cohen M, Millet MS. Skin tags: A cutaneous marker for diabetes mellitus. *Acta Derm Venereol*. 1987;**67**:175–7.
2. Agarwal JK, Nigam PK. Acrochordon: A cutaneous sign of carbohydrate intolerance. *Australas J Dermatol*. 1987;**28**:132–3.
3. Mathur SK, Bhargava P. Insulin resistance and skin tags. Dermatology. 1997;195:184.
4. Rasi A, Soltani-Arabshahi R, Shahbazi N. Skin tag as a cutaneous marker for impaired carbohydrate metabolism: A case-control study. *Int J Dermatol*. 2007;**46**:1155–9.

5. Akpinar F, Dervis E. Association between acrochordons and the components of metabolic syndrome. *Eur J Dermatol*. 2012;**22(1)**:106-10.
6. Demir S, Demir Y. Acrochordon and impaired carbohydrate metabolism. *Acta diabetologica*. 2002;**39(2)**:57-9. PubMed PMID: 12120914. https://doi.org/10.1007/s005920200014
7. Sari R, Akman A, Alpsoy E, Balci MK. The metabolic profile in patients with skin tags. *Clin Exp Med*. 2010;**10(3)**:193-7. doi: 10.1007/s10238-009-0086-5. Epub 2009 Dec 24.
8. Maluki AH, Abdullah AA. Metabolic Associations with Skin Tags. *Int J Dermatol Clin Res.* 2016;**2(1)**:003-011.
9. Sudy E, Urbina F, Maliqueo M, Sir T. Screening of glucose/insulin metabolic alterations in men with multiple skin tags on the neck. *J Dtsch Dermatol Ges*. 2008; **6(10)**:852-5.
10. Tamega Ade A, Aranha AM, Guiotoku MM, Miot LD, Miot HA. [Association between skin tags and insulin resistance]. *Anais Brasileiros de Dermatologia*. 2010;**85(1)**:25-31. PubMed PMID: 20464083. Associacao entre acrocordons e resistencia a insulina.
11. Gorpelioglu C, Erdal E, Ardicoglu Y, Adam B, Sarifakioglu E. Serum leptin, atherogenic lipids and glucose levels in patients with skin tags. *Indian J Dermatol*. 2009; **54(1)**:20-2.
12. Erdogan BS, Aktan S, Rota S, Ergin S, Evliyaoglu D. Skin tags and atherosclerotic risk factors. *J Dermatol*. 2005;**32(5)**:371-5.
13. El Safoury OS, Shaker OG, Fawzy MM. Skin tags and acanthosis nigricans in patients with hepatitis C infection in relation to insulin resistance and insulin like growth factor-1 levels. *Indian J Dermatol*. 2012;**57**:102-6.
14. Nicholas Angelopoulos, Anastasia Goula and George Tolis, Current knowledge in the neurophysiologic modulation of obesity. *Metabolism*. 2005;**54(9)**:1202-17.