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Hirsutism and Body Mass Index in Igala Adolescents of Nigeria

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ABSTRACT

Hirsutism is excessive terminal hair growth in women which follows a male pattern distribution. Adipose tissue contributes up to 50% of the circulating testosterone in premenopausal women due to excessive production of androgen in the fat tissue. This study is aimed at evaluating the relationship between body mass index and hirsutism. Three hundred and twenty two adolescent female students between the ages of 13-19 years were recruited in this study. The degree of hirsutism was determined by modified Ferriman Gallway score (F&G score), which quantified the presence of terminal hair over nine body parts: the upper lip, chin, chest, upper and lower abdomen, thighs, upper and lower back, and upper arms. The score varies from 0 (no hair) to 4 (extensive hair growth) in each area. Total score < 8 was termed normal hair growth, total score between 8-14 was termed mild hirsutism and total score ≥ 15 was termed severe hirsutism. Height and weight were measured using a stadiometer, and the body mass index was calculated as weight/height^2 (kg/m^2). The data were analyzed by SPSS version 20 (IBM, New York). There was no significant difference between the three groups in regards to age. On the other hand, a significant difference was observed in the three groups with respect to height ($P=0.008$) as female with normal hair growth were taller than those with mild and severe hirsutism. Weight and body mass index were higher in females with severe hirsutism as compared to those with mild hirsutism and normal hair growth. The Chi-square test showed an insignificant difference between the three groups regarding body mass index ($P > 0.05$)

Keywords: Hirsutism, Body mass index, Height, Weight

INTRODUCTION

Hirsutism is the occurrence of excessive hair in women in areas where hair is normally minimal or absent such as the face, chin and chest ^{1,2}. It occurs as a result of underlying endocrine imbalance which may be adrenal, ovarian, or central ³ and affects 5-15% of women irrespective of ethnic background ⁴. Hirsutism is more common in patients with high BMI, which may be a sign of an underlying metabolic disorder, which may lead to the greater risk of the development of cardiovascular disease and type-2 diabetes ⁵. Free testosterone and free androgen index is positively significant in patients with hirsutism and in patients with polycystic ovary syndrome, hence free androgen index can be used instead of free testosterone in hirsutism and polycystic ovarian syndrome for diagnosis ⁶. Body mass index (BMI) is a person's weight in kilograms divided by their height squared in meters ⁷. It seems hirsutism in people with simple obesity. The relation between obesity and hirsutism may be modified by racial and ethnic characteristics of different population ⁸.

MATERIALS AND METHODS

A total of 322 female subjects were used for the study. They were from Ankpa, Dekina, Idah, Ofu, Olamaboro, Omala, Ibaji and Igalamela dialects of the Igala ethnic group who were within the age range of 13-19 years and are students of Our Lady Secondary School, Anyigba. They were recruited by random sampling technique, they were informed about the study and those who gave their consent were included in the study. The degree of hirsutism was determined by modified Ferriman Gallway (F&G score), which quantified the presence of terminal hair over nine body parts: the upper lip, chin, chest, upper and lower abdomen, thighs, upper and lower back, and upper arms. The score varies from 0 (no hair) to 4 (extensive hair growth) in each area. Total score < 8 was termed normal

hair growth, total score 8-14 was termed mild hirsutism while total score ≥ 15 : moderate to severe hirsutism ⁹.

A questionnaire showing the degree of hair in different parts of the body was given to the subjects, which they used to assess themselves. The height and weight were measured with a stadiometer, while the body mass index was calculated by dividing the body weight with the squared of height (kg/m^2), and collected data were analyzed using SPSS version 20 (IBM New York).

RESULTS

Table 1 shows, the mean age and the mean height of those with normal hair growth, mild hirsutism and severe hirsutism. There was no significant difference within the three groups as regards to age. Height showed difference within the group that was statistically significant. BMI and weight were higher in subjects with severe hirsutism as compared to subjects with normal hair growth and mild hirsutism.

Table 2 shows the percentages of the prevalence of hirsutism, among hirsute females 12.7% had mild hirsutism while 16.8% had severe hirsutism.

Table 1: BMI, weight, age, and heights in the three different groups.

Variables	NH	MH	SH	P-value
	Mean± SD	Mean± SD	Mean± SD	
Age (years)	16.74± 1.83	16.46±1.75	16.48± 1.98	0.488
Height (cm)	153.14± 8.00	150.17±8.57	149.83±7.72	0.008
Weight (kg)	52.25± 7.14	52.70±7.42	53.02± 7.08	0.289
BMI (kg/m ²)	23.26± 3.55	23.41±3.54	23.77± 3.78	0.636

NH- Normal hair growth MH-Mild hirsutism SH- Severe hirsutism

Table 2: Ferriman-Gallwey score of hirsutism

Hirsutism score		Number	%
Non hirsute	<8	227	70.5
Mild	8-14	41	12.7
Severe	≥ 15	54	16.8
Total		322	100

DISCUSSION

In the current study hirsutism was more common in females with increased BMI, as the BMI had higher mean value in females with severe hirsutism (23.77) followed by females with mild hirsutism(23.41) whereas the non-hirsute females had the lowest mean value (23.26), hence there was a positive relation between body mass index and hirsutism.

This is as a result of accumulation of fat in the hirsute females, which is caused by hyperandrogenism. Hirsutism occur due to the interaction between the androgen level and the sensitivity of the hair follicle to androgen, hence most women with androgen level higher than the normal limit have hirsutism ¹⁰.

Age did not show a significant difference within the three groups. Height showed significant differences within the three groups, as females with normal hair growth were taller than those with mild and severe hirsutism, this may be related to the fact that females with mild and severe hirsutism have high level of androgen which is found more in males, giving them a male-like height. While the non-hirsute females have low level of androgen hence depicting the female like height, which is taller than males at adolescent stage ¹¹. More so, females with severe hirsutism had higher body weight as compared to those with mild hirsutism and normal hair growth. This may be as a result of an underlying metabolic disorder, which would subject the individual to the greater risk of the development of cardiovascular disease and type-2 diabetes ⁵.

This study revealed that females with severe hirsutism had higher body mass index and weight than females from other group, this is in agreement with the report of Farahnaz *et al.* in their study to observe hirsutism and body mass index in a representative sample of Iranian people, their report showed that

body mass index and weight were significantly higher in the case group than the control group⁷ and also with the study of Abdul-Aziz *et al* in their study to see the relationship of body mass index and hirsutism in adult females⁵. There is no evidence of association between hirsutism and BMI in the study conducted among students in Tirana university¹⁰.

In the present study 227 (70.5%) females had normal hair growth, 41 (12.7%) had mild hirsutism while 54 (16.8%) females had severe hirsutism. In our study severe hirsutism was more prevalence than mild hirsutism, this contradicts the findings of Abdul- Aziz *et al*. who reported mild hirsutism in 37.69% patients and and severe hirsutism in 0.76% patient and also the studies by Ansarin *et al*. who reported mild hirsutism in 65% and severe hirsutism in 2.5% of their patients¹².

CONCLUSION

This study clearly established that hirsute females had higher body mass index than the non-hirsute females, and that severe hirsutism was more prevalent among females with hirsutism than the mild hirsutism.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

REFERENCES

1. Kaufman, K.D. Androgens and alopecia. *Molecular and Cellular Endocrinology*, 2002; 198: 89-95.
- 2) Brodell, L.A., and Mercurio, M.G. Hirsutism: Diagnosis and management. *Gender Medicine*, 2010; 7: 79-89.
- 3) Blume-Peytavi, U., Gieler, U., Hoffman, R. and Shapiro, J. Unwanted facial hair: affects, effects and solutions. *Dermatology*, 2007; 215 (2):139-146
- 4) Azziz, R. The evaluation and management of hirsutism. *Obstetrics and Gynaecology*, 2003; 101(5): 995-1007
- 5) Abdul-Aziz, A., Mohammad, S., Kholood, J. The relationship of body mass index and hirsutism in adult females. *Our Dermatol Online*, 2015; 1: 276-279.
- 6) Gungor, G., Erden, C., Nihal, U., Sevilay, S., Ozdemir, H., Tugrul, C. and Metin, Y. The comparison of free androgen index and serum free testosterone levels in women with hirsutism or polycystic ovary syndrome. *Journal of Clinical and Experimental Investigation*, 2011; 2(2):152-156.
- 7) Farahnaz, F., Jamshid, N. and Nousin, J. Hirsutism and body mass index in a representative sample of Iranian people. *ARYA Atherosclerosis*, 2012; 1: 1-15
- 8) Carmina, E., Koyama, T., Chang, L., Stanczyk, F. and Lobo, R. Does ethnicity influence the prevalence of adrenal hyperandrogenism and insulin resistance in polycystic ovary syndrome? *American Journal of Obstetric and Gynecology*, 1992; 167: 1807-1812.
- 9) Gallway, F. Clinical assessment of body growth in women. *Journal of Clinical Endocrinology and Metabolism*. 1961; (11):1440-1447.

- 10) Abdel Fattah, Darwish, Y.W. Is there a role for insulin resistance in non obese patients with idiopathic hirsutism. *British Journal of Dermatology*, 2009; 160 (5):1011-1015
- 11) Alan, D.R and James, N.R. Growth at puberty. *Journal of Adolescent Health*, 2003; 31(6): 192-200
- 12) Chhabra, S., Gautam, R.K., Kulshrestha, B., Prasad, A and Sharma, N. Hirsutism: A clinic-investigative study. *International Journal of Trichology*, 2012; 4:246-250.