

Association between Skin Type and Idiopathic Hirsutism: A Case Control Study

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ABSTRACT

Background: Hirsutism is a medical condition characterized by presence of excessive terminal (coarse) hair among females in androgen-dependent areas. psychological well-being of females is negatively influenced by hirsutism. Poly cystic ovarian syndrome (PCOS) is the most common cause of hirsutism. However, hirsutism is found to exist without any underlying cause and is known as idiopathic hirsutism (IH). Studies have shown correlation between skin type and hirsutism among PCOS cohorts; however, no such relationship is known to exist between skin type and idiopathic hirsutism.

Objective: To determine association between skin type and idiopathic hirsutism.

Study Design: Case control study

Place and Duration of Study: Department of Dermatology, HIT Hospital Taxila from 1st March 2019 to 29th February 2020.

Methodology: 118 cases and 133 controls were included in study after informed consent. Skin type was determined by Fitzpatrick skin type (FST) rating scale ranging from I to IV. Modified Ferriman-Gallwey (mFG) visual four-point scale was used to quantify hirsutism into mild, moderate and severe.

Results: Mean age of cases and controls was 31.01±9.5 years and 28.01±9.7 years respectively. Seventy four (62.7%) of cases and 88 (66.2%) controls had type III skin type. Eighty (67.8%) had mild (8-15) hirsutism. Statistically insignificant (P<0.05) association was found to exist between skin type and idiopathic hirsutism and severity of hirsutism. However, a statistically significant (P<0.05) association existed between hirsutism and BMI.

Conclusion: Idiopathic hirsutism is found to have no association with skin type III or IV among Caucasians. However, this finding needs further investigation involving diverse population including representation from all skin types (I and II)

Key Words: Idiopathic hirsutism, Skin types, PCOS, Hyperandrogenemia

INTRODUCTION

Hirsutism refers to the development of excessive terminal hair growth in an androgen-sensitive skin distribution in women. Hirsutism is caused by an excess production or action of hormones called androgens, secreted by the ovaries or adrenal glands and produced locally in the hair follicle.¹ Idiopathic hirsutism (IH) is the presence of excessive hair characterized by absence of hyperandrogenemia and anovulation. Polycystic ovarian syndrome (PCOS) is prevalent among patients having hirsutism ranging from 2.2% to 26%. However, approximately 5% to 20% cases of hirsutism have no underlying cause and are labelled as idiopathic.^{2,3}

Modern culture set a standard according to which women ought to have slight or no body hair, even though it is usual for women to have some extent of body and facial hair.⁴ Females are obsessed with having clear and smooth skin which adds on to the perfect image females are supposed to carry. Having hair growth in male pattern leads to low self-esteem, that can be detrimental for health social wellbeing.⁵ The modified Ferriman-Gallwey (mFG) is mainly used to assess and calculate degree of hirsutism, it scores hair growth in nine androgen-dependent body areas. It is a visual four-point score. The scale rates hirsutism from 0 to 36 and clinically hirsutism is defined as a sum of all areas with mFG score of 8 or greater.⁶

Race and ethnicity play a major role in the growth of body hair and it vary in different races and ethnicities. Relatively thin body hair are seen in Native American and Eastern Asian women, whereas Middle Eastern, Mediterranean and Southern Asian women likely to have moderate to enormous volume of body hair.⁷ Modified Ferriman-Gallwey (mFG) scoring system was designed keeping in view primarily Northern European (Caucasian) women, so application of the tool become debatable in the assessment of hirsutism in women of other region.^{8,9} It was suggested by Androgen Excess-PCOS (AE-PCOS) Society, the requirement for ethnic-specific mFG cutoff scores to delineate hirsutism in women. Therefore, hirsutism was redefined as the cut-off value of 95th percentile of the mFG score of the related general population

ethnicity and age. If value is inaccessible, it was recommended that a cut-off value of 8 or above will be used for White and Black women. However, this be decreased to three or above for South East Asian and Far East women.¹

Skin colour is classified using Fitzpatrick skin type (FST) scale based on skin pigment, its reaction to sunlight and tanning tendency. It is used to assess the risk of skin cancer, photo damage and used to evaluate reaction of skin type to cosmetic procedures.¹⁰ Skin type is genetically determined and is one of the several characteristics of the general appearance, in which colour of eyes and hair also contribute.

In African Americans, Hispanics, Middle Eastern and South Asian PCOS patients, high prevalence of hirsutism is found to exist with increasing mFG scores. Hirsutism is found to have a positive correlation with higher FSTs (Fitzpatrick skin type rating scale). However, the generalizability of these findings among PCOS cohorts is limited to idiopathic hirsutism. Therefore, this study aimed to determine the association between skin type and idiopathic hirsutism to contribute to fulfilment of literature gap to establish the existence of any such association of skin type with idiopathic hirsutism among Caucasian population of this region.

MATERIALS AND METHODS

This case control study was conducted at HIT Hospital Taxila from 1st March 2019 to 29th February 2020 with 118 were cases and 133 were controls. Informed consent for participation in study was taken from study participants. Confidentiality and anonymity were ensured for both cases and controls. Modified Ferriman-Gallwey (mFG) visual scoring was used to categorize hirsutism as normal (<8), Mild (8-15), moderate (16-24) and severe (>24). To avoid inter observer variation in categorizing hirsutism using mFG visual scale, single observer examined and categorized study participants into cases and controls. Female patients of all ages having idiopathic hirsutism excluding any underlying disease like PCOs, Cushing syndrome, adrenal tumour, or drugs history like systemic steroids, cyclosporine, danazol and minoxidil and having mFG score more than 8 were taken as cases. All cases had 100%

facial involvement as these patients were selected for laser treatment of face whereas female patients of all ages reporting to Dermatology OPD with any other complain having mFG score less than 8 were taken as controls. Cases were selected through purposive sampling and controls were matched according to age and marital status. Rating of skin type of cases and controls was done using Fitzpatrick skin type (FST) rating scale. Data was analyzed using SPSS-26. Frequencies were calculated for demographic variables and Chi square test of significance was applied to determine association between skin type and hirsutism and its severity. P value was taken significant at ≤ 0.05 .

RESULTS

One hundred and eighteen (47%) cases of idiopathic hirsutism and 133 (53%) were controls without hirsutism. The mean age of study participants was 28.01 ± 9.7 . The mean BMI of study participants was 25.4 ± 7.2 kg/m² (Table 1). One hundred and sixty two (64.5%) had skin type III and 89 (35.5%) had skin type IV (Table 2).

Statistically significant association was found to exist between study groups and BMI. However, a statistically insignificant association was found between skin type (III and IV) and study groups. Similarly, statistically insignificant association was found between skin type and severity of hirsutism (Tables 3-4). The odds ratio calculated to determine association between skin type and hirsutism was .86 (CI= .51-1.44) [Table 5].

Table 1: Demographic information of the participants

Variable	Cases (n=118)	Controls (n=133)
Age	31.01±9.5	28.01±9.7
Marital status		
Married	75 (63.5%)	72 (54.1%)
Unmarried	43 (36.4%)	61 (45.8%)
Working status		
Employed	6 (8.08%)	-
House wife	69 (58.4%)	72 (54.1%)
Student	43 (36.4%)	61 (45.8%)
Body mass index (kg/m ²)		
Underweight	-	40 (30.1%)
Normal	34 (28.8%)	42 (31.6%)
Overweight	28 (23.7%)	39 (29.3%)
Obese	56 (47.5%)	12 (9.0%)

Table 2: Distribution of study variables among study groups

Variable	Cases (n=118)	Controls (n=133)
Skin Type		
III	74 (62.7%)	88 (66.2%)
IV	44 (37.3%)	45 (33.8%)
Ferryman-Gallwey Score of Hirsutism		
Normal (<8)	-	133 (100%)
Mild (8-15)	80 (67.8%)	-
Moderate (16-24)	37 (31.4%)	-
Severe (>24)	1 (.8%)	-

Table 3: Association between hirsutism and BMI

BMI Category	Cases	Controls	P value
Underweight	-	40	0.001*
Normal	34	42	
Over weight	28	39	
Obese	56	12	

Statistically significant at .05

Tab 4: Association between skin type and hirsutism

Skin Type	Cases	Controls	P value
III	74	88	0.33
IV	44	45	

Tab 5: Association between skin type and severity of hirsutism

Ferryman-Gallwey Score of Hirsutisms	Skin Type		P value
	III	IV	
Mild	48	32	0.54
Moderate	25	12	
Severe	1	-	

DISCUSSION

The analysis of this case control study revealed slight differences in demographics of patients with hirsutism and their controls. Skin type of all the study participants was type III and IV according to the Fitzpatrick skin type (FST) rating scale. Majority of the cases included in this study had mild to moderate hirsutism according to Ferryman-Gallwey Score of Hirsutism. However, skin type was found to have no association with hirsutism or its severity thereby rejected the study hypothesis.

Results of this study are consistent with research carried out by Afif et al⁷ that investigated the association of ethnicity, Fitzpatrick skin type and hirsutism. Afif et al⁷ also reported that highest mFG scores were observed with skin type V and VI followed by those having skin Types III and IV. In present study, majority of the cases with mild (mFG 8-15) to moderate (mFG 16-24) had skin type III and IV. However, no association was found to exist between skin type and mFG scores in present study. The homogeneity of study participants in terms of skin type is attributed to non-observance of this association.

Our findings are partially consistent with results of Javorsky E's work, that racial groupings were found to predict the facial hair growth, whereas the lighter skin was not associated with facial hair growth ($p > .05$). In present study 64.8% (n=48) of those having skin type III had mild mFG scores and 72.7% (n=32) of those having skin type IV had mild mFG score.⁸ However, non-representation of skin type I and II in present study limits the existence of association of increasing score on Fitzpatrick skin type (FST) rating scale with modified Ferryman-Gallwey Score of Hirsutism. Secondly, the racial and ethnic prediction of hair growth was not studied in this study.

Regarding BMI, results of this study are supported by another study conducted in India. In present study BMI was statistically associated with hirsutism. Among cases 28 (23.7%) were overweight and 56 (47%) were obese. According to Indian study, 20% of study population with idiopathic hirsutism was obese and 16% were overweight. Regarding severity of hirsutism, 40 (80%) patients had mild hirsutism score, moderate hirsutism among 10 (20%) patients, whereas, none of the patient had severe hirsutism.⁹ These findings are partially consistent with results of present study, where 80 (67.7%) had mild, 37 (31.3%) had moderate and only 1 (0.84%) had severe hirsutism. This similarity might be due to same Caucasian origin of two populations in these studies.

Few studies have mentioned the increased prevalence of hirsutism with increasing score on skin type scale however, literature is deficient in establishing existence of either positive or negative association between skin type and idiopathic hirsutism. Contradictory to the results of our study, another study carried out by Mahajan¹⁰ highlighted the increased frequency of hirsutism among unmarried females, whereas hirsutism was found to be more frequent among married females in our study. However, the same study reported 29 (23.8%) cases of hirsutism were obese, which complement the findings of our study. This similarity in results is likely due to similar geographic origin of two study populations.

Homogeneity of study population with presentation of only type III and IV skin type limited the generalizability of results of present study. A diverse population of various ethnic origins and races must be studied to determine the existence of any association between skin type and hirsutism. Underlying conditions that might contribute to hair growth must be ruled out on basis of clinical investigations unlike just upon basis of history as done in this study, to rule out the possible confounding role in determination of association.

CONCLUSION

No association was found to exist between skin type and idiopathic hirsutism. Studies with larger sample size including multiracial and multi-ethnic populations must be carried out to determine

correlation between FST and mFG scores to establish association of idiopathic hirsutism with skin type among females have no underlying predictor of hirsutism.

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