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A SURVEY-BASED STUDY ON THE PREVALENCE OF HAIR LOSS AND IT'S ASSOCIATIONS IN MALE ADULTS OF NATIONAL CAPITAL REGION

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Abstract

Background: Hair loss though not a major disease or symptom unless caused due to any underlying diseases. The prevalence of hair loss has increased in present young adults which hampers their self-respect affecting their quality of life. Many people of this age group use different chemicals to treat their hair and apply many home remedies to treat hair fall, it shows how people are concerned with their hair, so this study was done to learn the psychological and genetic aspects of hair loss.

Methods: A group of 387 males in NCR were randomly enrolled during the survey, fulfilling the criteria according to the protocol. The data was collected using three questionnaires (PSS, PHQ-9, Norwood scale), which included demographic data(age) and personal history like diet and family history of hair loss and were circulated through Google forms. The data was analyzed using Microsoft Excel 2016 and SPSS version 20 software.

Results: The result showed prevalence and association of hair loss in male adults of NCR. The mean age was 23.324 ± 4.357. Factors like male and female history of hair loss, stress, depression, itchy scalp and scalp tenderness showed significant association with hair breaking(p-value=0.00001, 0.003, 0.025, 0.044, 0.00001, 0.025),with hair coming out(p-value= 0.005, 0.014, 0.037, 0.008, 0.008, 0.00001), with Norwood scale(p-value= 0.00001, 0.00001, 0.008, 0.03, 0.00001, 0.908(not significant)).

Conclusion: Our study found association of hair loss with age group, stress, depression, scalp problems, male and female family history of hair loss and was statistically significant.

Keywords: PSS, PHQ9, NORWOOD SCALE, Hair Breaking Off, Hair coming out, stress and depression

I. INTRODUCTION

Hair loss among young adults is increasing at an alarming rate these days. Approximately 100 hairs every day are shed after their growth cycle, which passes unnoticed most of the time. [1]

Each hair goes through three stages of growth. Around 85 to 90% of the hair on the head is in the anagen or growth stage. They spend 2 to 6 years in this stage. The catagen or involution phase, which affects 2-3 percent of hair follicles, follows. [1]

The telogen phase is the final stage, during which 10-15 percent of hair follicles rest for about three months. The hair is evacuated from the skin at this point, leaving a firm, hard nodule behind. [1]

There are numerous reasons, including genetic predisposition. Hair loss can be caused by a variety of circumstances, including hereditary predispositions. Although genetic predisposition to hair loss cannot be effectively treated, environmental and personal factors that cause hair loss can be cured after the primary stressor is removed. The most common type of hair loss in men is male pattern hair loss, which is caused by androgenic alopecia (AGA). By the age of 50, it had affected 30-60% of men. Male pattern hair loss though considered a minor medical issue but can cause anxiety and despair in some men because their self-esteem is affected. [2]

The survey aims to assess how many adult males are suffering from hair loss from this age group(18-30yrs) in NCR and the association with causal factors of hair loss.

II. Rationale of the study

- This study is conducted as people of this age group 18-30 have reported hair loss and hampering their self-respect and quality of life and ultimately affecting the performance of the individual.
- The males of this age group are most affected by hair loss due to stress, changes in the hormones and mostly due to heredity.
- The need to study hair loss in NCR adults was taken into consideration due to the stressful life that is prevalent in city life among students and adults and the deprivation of social life among most students living in apartments causing an increase in stress levels.
- The people living here are mostly from various parts of India making this study more diversified.

III. RESEARCH METHODOLOGY

3.1Population and Sample

After procuring the approval of the Institutional Ethics Committee, the prospective, survey based cross sectional observational study on the prevalence of hair loss in the age group of 18-30 yrs and its association with heredity, diet, stress and male pattern baldness was initiated.

3.2Data and Sources of Data

Data collected through google forms from the subjects and tabulated in M S excel 2019.

3.3Data analysis and result

The collected data was entered in a datasheet for analysis and tabulation in Microsoft Excel 2019.Statistical test such as Chi-square test and Multinomial logistic regression were used in SPSS version 20.

3.4Study Design: A cross sectional observational [survey based] study using Google forms

3.5Study Period: January 2021 to June 2021.

3.6Type of study: Cross sectional observational study

3.7Sample Size: 384

3.8Inclusion Criteria

- Males between age 18 to 30
- Males only from NCR
- Males who are willing to fill our Google form

3.9Exclusion Criteria

Adults having age > 30yrs and < 18years

- Suffering from a terminal disease
- Any autoimmune disease
- Weight
- Girls and transgenders
- Medication that may lead to hair loss
- Not willing to fill the survey

3.10DEVELOPMENT OF QUESTIONNAIRE

For the survey-based study following validated questionnaires were used

- Norwood Scale(for male pattern baldness)
- Patient Health Questionnaire (PHQ-9)
- Perceived stress scale (PSS)

Besides this, demographics data of subjects including age, diet and family history of baldness also included.

STUDY PHASE -1:

- Review of literature
- selection of topic
- protocol preparation
- questionnaire designing
- selection of place.

STUDY PHASE-11:

- Institutional Ethics Committee approval obtained and study was initiated
- Subjects enrolled according to inclusion/ exclusion criteria of the study.

STUDY PHASE- 111:

- Information regarding the patient's demographics, family history, diet and stress assessment were collected.

STUDY PHASE -1V:

- Data collected using google forms and analyzed in MS Excel 2019.

STUDY PHASE-V

- The above data was statistically tested using chi-square and multinominal logistic regression methods in SPSS version 20 software .

IV. RESULTS AND DISCUSSIONS

Table 4.1 Age Distribution Of Participants

AGE (YEARS)	FREQUENCY	PERCENT %	CUMULATIVE PERCENT%
18-20	41	10.6	10.6
21-26	295	76.2	86.8
27-30	51	13.2	100.0
TOTAL	387	100.0	

Mean age = 23.324 ± 4.357

Table 4.2 Hair Coming Out * Specified Age Group

		Age group (years)			Total	Chi-square p-value
		18-20	21-26	27-30		
Hair coming out	YES	17	126	28	171	0.252
	NO	24	169	23	216	
Total		41	295	51	387	

Interpretation
There was no association between hair coming out and specified age group (p-value=0.252).

Table 4.3 Hair Breaking Off * Specified Age Group

		Age group (years)			Total	Chi-square p-value
		18-20	21-26	27-30		
Hair breaking off	YES	23	135	26	184	0.403
	NO	18	160	25	203	
Total		41	295	51	387	

Interpretation
There was no association between hair breaking off and specified age group (p-value=0.403).

Table 4.4 Association Of Stages Of Hair Loss Within Specified Age Group

		Age group (years)			Total	Chi-square p-value
		18-20	21-26	27-30		
Stages	Stage 1	34	160	11	184	0.00001
	Stage 2-7	7	135	40	203	
Total		41	295	51	387	

Interpretation
Using Norwood scale we found that Age group was associated with hair loss and this association was found to be statistically significant (p-value=0.00001).

Table 4.5 Hair Breaking Off * Scalp Tenderness

		Scalp tenderness		Total	Chi-square
		Yes	No		p-value
Hair breaking off	YES	29	155	184	0.025
	NO	17	186	203	
Total		46	341	387	

Interpretation
hair breaking off was associated with scalp tenderness and this association was found to be statistically significant (p-value=0.025)

Table 4.6 Hair Coming Out * Scalp Tenderness

		Scalp tenderness		Total	Chi-square
		Yes	No		p-value
Hair coming out	YES	32	139	171	0.001
	NO	14	202	216	
Total		46	341	387	

Interpretation
hair coming out was associated with scalp tenderness and this association was found to be statistically significant (p-value=0.001).

Table 4.7 Stage * Scalp Tenderness

		Scalp tenderness		Total	Chi-square
		Yes	No		p-value
Stages	Stage 1	24	181	205	0.908
	Stage 2	22	160	182	
Total		46	341	387	

Interpretation
Using Norwood scale we found that there was no association between hair coming out and depression (p-value=0.908).

Table 4.8 Hair Breaking Off * Itchy Scalp

		Itchy scalp		Total	Chi-square
		Yes	No		p-value
Hair breaking off	Yes	98	86	184	0.00001
	No	61	142	203	
Total		159	228	387	

Interpretation
hair breaking off was associated with itch scalp and this association was found to be statistically significant (p-value=0.00001)

Table 4.9 Hair Coming Out * Itchy Scalp

		Itchy scalp		Total	Chi-square p-value
		Yes	No		
Hai coming out	Yes	83	88	171	0.008
	No	76	140	216	
Total		159	228	387	

Interpretation

hair coming out was associated with itchy scalp and this association was found to be statistically significant (p-value=0.008)

Table 4.10 Stage *Itchy Scalp

		Itchy scalp		Total	Chi-square p-value
		Yes	No		
Stages	Stage 1	60	145	205	0.00001
	Stage 2-7	99	83	182	
Total		159	228	387	

Interpretation

Using Norwood scale we found that itchy scalp was associated with hair loss and this association was found to be statistically significant (p-value=0.00001).

Table 4.11 Hair Breaking Off * Male Family History

		Male family history		Total	Chi-square p-value
		Yes	No		
Hair breaking	Yes	88	96	184	0.000015
	No	54	149	203	
Total		142	245	387	

Interpretation

hair breaking off was associated with scalp tenderness and this association was found to be statistically significant (p-value=0.000015).

Table 4.12 Hair Coming Out * Male Family History

		Male family history		Total	Chi-square p-value
		Yes	No		
Hair coming out	Yes	69	84	153	0.005
	No	73	161	234	
Total		142	245	387	

Interpretation

hair coming out was associated with male family history and this association was found to be statistically significant (p-value=0.005).

Table 4.13 Male Family History * Stage

		Male family history		Total	Chi-square
		Yes	No		p-value
Stages	Stage 1	41	164	205	0.00001
	Stage 2-7	101	81	182	
Total		142	245	387	

Interpretation

Using Norwood scale we found that male family history was associated with hair loss and this association was found to be statistically significant (p-value=0.000).

Table 4.14 Hair Breaking Off * Female Family History

		Female family history		Total	Chi-square
		Yes	No		p-value
Hair Breaking off	Yes	35	149	184	0.037
	No	18	185	203	
Total		53	334	387	

Interpretation

hair breaking off was associated with scalp tenderness and this association was found to be statistically significant (p-value=0.0037).

Table 4.15- Hair Coming Out * Female Family History

		Female family history		Total	Chi-square
		Yes	No		p-value
Hair coming out	Yes	29	124	153	0.014
	No	24	210	234	
Total		53	334	387	

Interpretation

hair coming out was associated with female family history and this association was found to be statistically significant (p-value=0.014).

Table 4.16 - Stage * Female Family History

		Female family history		Total	Chi-square
		Yes	No		p-value
Stages	Stage 1	9	196	205	0.050
	Stage 2-7	44	138	182	
Total		53	334	387	

Interpretation

Using Norwood scale we found that female family history was associated with hair loss and this association was found to be statistically significant (p-value=0.050).

Table 4.17- Hair Breaking Off * Eating Habits

		Eating habits				Total	Chi-square
		Non-Veg	Mixed diet	Vegetarian	Eggetarian		p-value
Hair breaking off	Yes	47	92	33	12	184	0.470
	No	41	117	34	11	203	
Total		88	209	67	23	387	

Interpretation
There was no association between hair breaking off and eating habits (p-value= 0.470).

Table 4.18- Hair Coming Out * Eating Habits

		Eating habits				Total	Chi-square
		Non-Veg	Mixed diet	Vegetarian	Eggetarian		p-value
Hair coming out	Yes	35	90	28	18	171	0.008
	No	53	119	39	05	216	
Total		88	209	67	23	387	

Interpretation
hair coming out was associated with eating habits and this association was found to be statistically significant (p-value=0.008).

Table 4.19- Stage * Eating Habits

		Eating habits				Total	Chi-square
		Non-Veg	Mixed diet	Vegetarian	Eggetarian		p-value
Hair breaking off	Stage 1	41	110	44	10	205	0.085
	Stage 2-7	47	99	23	13	182	
Total		88	209	67	23	387	

Interpretation
Using Norwood scale we found that eating habits had no association with hair loss (p-value=0.085).

Table 4.20- Breaking Off * Depression PHQ-9

		Depression PHQ-9					Total	Chi-square
		none	mild	moderate	Moderately severe	Severe		p-value
Hair breaking off	Yes	37	48	55	34	10	184	0.044
	No	62	61	42	32	06	203	
Total		99	109	97	66	16	387	

Interpretation

hair breaking off was associated with depression and this association was found to be statistically significant (p-value=0.044).

Table 4.21- Hair Coming Out * Depression PHQ-9

		Depression PHQ-9					Total	Chi-square p-value
		none	mild	moderate	Moderately severe	Severe		
Hair breaking off	Yes	29	47	33	34	10	153	0.008
	No	70	62	64	32	06	234	
Total		99	109	97	66	16	387	

Interpretation
hair coming out was associated with stress and this association was found to be statistically significant (p-value=0.008).

Table 4.22- Stage* Depression PHQ-9

		Depression PHQ-9					Total	Chi-square p-value
		none	mild	moderate	Moderately severe	Severe		
Depression PHQ-9	Stage 1	58	53	50	36	04	205	0.03
	Stage 2-7	36	56	48	30	12	182	
Total		116	109	81	65	16	387	

Interpretation
Using Norwood scale we found that depression was associated with hair loss and this association was found to be statistically significant (p-value=0.03).

Table 4.23- Hair Breaking Off * Stress

		PSS			Total	Chi-square p-value
		Low	Moderate	High		
Hair Breaking off	Yes	33	130	21	184	0.025
	No	51	142	10	203	
Total		84	272	31	387	

Interpretation
hair breaking off was associated with stress and this association was found to be statistically significant (p-value=0.025).

Table 4.24- Hair Coming Out * Stress

		PSS			Total	Chi-square p-value
		Low	Moderate	High		
Hair coming out	Yes	25	111	17	171	0.037
	No	59	161	14	216	
Total		84	272	31	387	

Interpretation
hair coming out was associated with stress and this association was found to be statistically significant (p-value=0.037).

Table 4.25- Association Of Stages Of Hair Loss With Stress

		PSS			Total	Chi-square p-value
		Low	Moderate	High		
Stages	Stage 1	55	139	11	205	0.0088
	Stage 2-7	29	133	20	182	
Total		84	272	31	387	

Interpretation

Using Norwood scale, we found that stress was associated with hair loss and this association was found to be statistically significant (p-value=0.0088).

Table 4.26- Related Kins(Having Both Male And Female Family History Of Hairloss)* Stage

		Stages		Total	Chi-square p-value
		Stage 1	Stage2-7		
Related Kins	Yes	01	27	28	0.00001
	No	204	155	359	
Total		205	182	387	

Interpretation

Using Norwood scale we found that male family history was associated with hair loss and thisassociation was found to be statistically significant (p-value=0.00001).

Table 4.27- Association Of Stages Of Hair Loss With Hair Coming Out

		Stages		Total	Chi-square p-value
		Stage 1	Stage 2-7		
Hair coming out	Yes	76	95	171	0.003
	No	129	87	216	
Total		205	182	387	

Interpretation

Using Norwood scale we found that hair coming out was associated with hair loss and this association was found to be statistically significant (p-value=0.003).

Table 4.28- Association Of Stages Of Hair Loss With Hair Breaking Off

		Stages		Total	Chi-square p-value
		Yes	No		
Hair breaking off	Yes	74	110	184	0.00001
	No	131	72	203	
Total		205	182	387	

Interpretation

Using Norwood scale we found that hair breaking off was associated with hair loss and this association was found to be statistically significant (p-value=0.00001).

Table 4.29 Compilation Of Association Between Each Factors (P-Value)

	HAIR COMING OUT	HAIR BREAKING OFF	NORWOOD SCALE
AGE	0.252	0.403	0.005
SCALP TENDERNESS	0.00001	0.025	0.908
ITCHY SCALP	0.008	0.00001	0.00001
MALE HEREDITARY	0.005	0.00001	0.00001
FEMALE HEREDITARY	0.014	0.003	0.00001
EATING HABITS	0.008	0.470	0.085
DEPRESSION	0.008	0.044	0.03
STRESS	0.037	0.025	0.0088

NO ASSOCIATION

ASSOCIATION

Discussion

The present survey-based, observational, cross-sectional study aims to evaluate the prevalence of hair loss and the association between age, diet, hereditary, depression and stress in NCR adults with an age group between 18 and 30 years. A questionnaire was made which contains demographic details, family history of hair loss, depression and stress assessment. A Questionnaire circulated through Google forms to adults of NCR region. The 387 males participated in the study and their confidentiality of data was preserved at all levels of the study. The data obtained from the Google forms was documented in a MS Excel sheet

Among 387 males enrolled in the survey, the mean age of the study population was 23.324 ± 4.357 years.

In our study we have distributed age group into 3 categories i.e.,18-20 years, 21-26 yrs, 27-30yrs and 11%, 76% and 13% of participants out of total from each group took part in survey respectively. This category was taken into consideration after looking into stress factors, diet, sedentary lifestyle etc.

From the analysis of our study we found that characteristics of hair such as hair breaking off showed association with certain factors and had statistical significance with scalp tenderness (p-value = 0.025), itchy scalp(p-value=0.000), male and female family history (p-value=0.000 , 0.014), Depression(p-value=0.044) and stress(p-value=0.025). Many evidences from the study of ***Laurent Misery, McLaren, Chumlea W.C., Gan et al, Soorih Shaikh***[3,4,5,6,7] derives the association of above mentioned factors with hair loss.

In the similar manner the characteristic of hair coming out showed association with scalp tenderness(p-value=0.000), itchy scalp(p-value=0.008), male and female family history(p-value=0.001,0.003) as well as eating habits(p-value=0.008) and stress(p-value=0.037). Earlier studies ***McLaren, Chumlea W.C., Gan et al, Soorih Shaikh***[3,4,5,6] give enough evidence in relation to the above mentioned factors.

After the survey our study found that in age group between 18-30 yrs around 53% of adults had no significant hair loss though they had hair related problems (itching, scalp tenderness, hair breaking
off and coming out). This result was almost similar though less to Norwood et al study in which around 60% of adults of age group 18-29 yrs were found to be having no problem of hair loss.[8]

Norwood scale was used as standard to determine the stage of hair loss in men. It was found that there is strong association with loss of hair with increasing age (p- value=0.000). The result supports earlier studies done by ***Hamilton, Norwood, Rhodes, Stough et al***[9,10,11,12].

Further the study showed no association between hair loss in men and the diet(p-value=0.085) though most doctors suggest that mixed diet is best for overall health. And some studies ***(by Mc laren)*** [5] even suggest low amount of protein in body can cause hair loss. Non-vegetarians have higher intake of proteins than vegetarians.

We have analyzed the association of hair loss with family history of hair loss using Norwood scale and the result was statistically significant as participants with male and female family history of hair loss had significant hair loss(p- value= 0.000, 0.05) and we also found the prevalence of hair loss in related kins and there was a strong association which was statistically significant (p value=0.000)this backs up the evidences given in the studies ***by York et al, Shankar et al, Chumlea W.C.***. [13,4,14]

Using Norwood scale, we also analysed the association of hair with depression and stress. There was a significant association with both depression (p-value=0.03) and stress (0.008). Various studies have suggested significant relation of hair loss with stress such as ***Mariola Alfonso et al, Soorih Shaikh, Kumar et al***. [15,3,9] Few studies suggest relation of hair loss with depression like the study done on Chennai based population by ***Varman et al*** [10] which showed a statistical association of depression with hair loss (p-value=0.001). other studies that of relation between depression and hair loss ***by Schmitt JV***[18] shows that 54% of their sample size had hair loss due to depression though not so significant but studies concludes that there may be link between hair loss and depression

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