International Journal of Medical Science and Clinical Invention 5(06): 3894-3898, 2018
DOI:10.18535/ijmsci/v5i6.11 **ICV 2016: 77.2**
e-ISSN:2348-991X, p-ISSN: 2454-9576

Research Article

Analysis of Anxiety and Depression In Five Hundred Patients In A Tertiary Care Hospital With Common Hair Disorders Using Hads Scale

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Abstract:

INTRODUCTION: World Health Organization (W.H.O.) defines health as a complete state of physical, mental and social well-being not merely an absence of disease or infirmity. Functional or psychological disorders are on a rise with the modernization and industrialization. In this study we have correlated anxiety and depression which are the two most important psychological diseases with four common hair disorders alopecia areata, androgenic alopecia, telogen effluvium and premature graying of hair.

BODY TEXT: We took five hundred cases between the age of 18 and 45 years, of the four hair disorders alopecia areata, androgenic alopecia, telogen effluvium and premature graying of hair and screened them for anxiety and depression by Hospital Anxiety and Depression Score (HADS) for anxiety and depression. Scale is reprinted in table 1. We also analysed anxiety and depression in otherwise healthy population of same area after eliminating regional, age and sex bias and tabulated and compared the result. Data were analyzed by SPSS ver. 22.0 software, independent T-test, multi variate analysis of covariance (MANCOVA) and chi-square test for comparison the quantitative and ordinal data, respectively; with $\alpha <= 0.05$.

RESULT AND DISCUSSION: There was significant correlation of anxiety and depression with the above four common hair disorders correlating with the p of value less than 0.05. Brain- hair follicle axis and stress-skin system are still being studied. Many theories have been given by studies in mice. Hereby, clinical implications of these theories corroborate with our study of five hundred subjects.

CONCLUSION: Any patient should be treated as a whole and skin and hair can be important signs of mental illness which decrease the quality of life and work efficiency. Hence, in common disorders like androgenic alopecia, telogen effluvium, premature graying of scalp hair and alopecia areata, a vigilant approach is needed to diagnose and treat anxiety and /or depression as well.

Keywords: Alopecia areata, androgenic alopecia, telogen effluvium, premature graying, anxiety, depression

INTRODUCTION:

Anxiety and Depression are common illnesses with grave outcomes. The basis of neuro-cutaneous axis holds an important role in pathogenesis of hair and skin disorders which is not yet documented in its full spectrum. [1] Many studies have shown that skin and psychology are co-related. [2] Hair is an appendage which is correlated with brain by many ways. Few syndromes are documented with physical diseases involving skin, hair and brain like Alezzandrini, Vogt- koyanagi- harada, Waardenburg syndrome. Psychological effects of hair disorders and vice versa are less studied. Hereby, we have carried out the psychological analysis in patients with hair disorders presenting as hair fall, thinning of hair, decrease in growth of hair, premature graying of hair etc. Immuno biological evidence supporting the role of stress in hair loss has also been explained as tumor necrosis factor alpha (TNFα) or interferon gamma (IFNγ) release under stressful events.[1],[3] These mediators further participate in modifying adaptive immunity of skin and hair and drive it to premature death.

MATERIAL AND METHODS:

Our study was conducted from June 2016 to October 2016 in a tertiary care center. Randomization was done by including every other patient of hair loss. To eliminate age as confounding factor we restricted study to 18-45 years age group. After taking consent, we analysed prevalence of anxiety and depression by using Hospital anxiety and depression score (HADS) in 500 patients presenting with various hair complaints. We excluded the patients with scarring hair loss and trichotillomania. Scarring hair loss like discoid lupus erythmatosus, lichen plano pilaris are usually associated with systemic diseases and trichotillomania is a well defined and documented impulse controlled disorder of hair picking. Hence, we excluded them due to confounding diseases in scarring alopecia and well documented correlation in trichotillomania. We also included 500 controls that were otherwise healthy, free from any active hair problem or systemic illness and were from nearby residential area. We divided the hair diseases in groups according to their clinical diagnosis which were- Male or female patterned baldness clubbed as Androgenic alopecia, alopecia areata, telogen effluvium and premature graying of hair. We correlated diagnosis of each variety of hair loss with anxiety and depression using Hospital anxiety and depression score – Anxiety (HADS-A), Hospital anxiety and depression score – depression (HADS-D). Scale is reprinted in table 1.

Table 1: HADS Scale

Items on the questionnaire
The items on the questionnaire that relate to **anxiety** are
I feel tense or wound up
I get a sort of frightened feeling as if something bad is about to happen
Worrying thoughts go through my mind
I can sit at ease and feel relaxed
I get a sort of frightened feeling like butterflies in the stomach
I feel restless and have to be on the move
I get sudden feelings of panic
The items that relate to **depression** are:
I still enjoy the things I used to enjoy
I can laugh and see the funny side of things
I feel cheerful
I feel as if I am slowed down
I have lost interest in my appearance
I look forward with enjoyment to things
I can enjoy a good book or radio or TV programme

HADS- A and HADS-D was analyzed in controls as well. HADS-A has specificity of 0.78 and a sensitivity of 0.9 and HADS-D, has a specificity of 0.79 and a sensitivity of 0.83.[4] In HADS scoring we only labeled as anxiety and depression of more than 11 score in both which meant definite correlation with anxiety and depression in the scale thus increasing the specificity. Data were analyzed by SPSS ver. 22.0 software, independent T-test, multi variate analysis of covariance (MANCOVA) and chi-square test for comparison the quantitative and ordinal data, respectively; with $\alpha<=0.05$.

RESULTS:

Null hypothesis was proven wrong and there was significant correlation of hair loss in all four varieties with anxiety as well depression. p value for anxiety and hair disorders clubbed together was .002 which is significantly low and hence a positive association was proved. p value of depression was .000001 which proves strong association of depression with hair fall.

We also studied androgenic alopecia, Alopecia areata, telogen effluvium and premature graying of hair separately and results are summarized in table – all four are showing a significant higher correlation than controls. It is shown in table 3.

Table: 3 – Analysis of anxiety and depression in cases and controls

Diagnosis	Anxiety	Depression	Total patient
Androgenic Alopecia	17	28	250
Telogen Effluvium	12	17	108
Premature graying	9	13	95
Alopecia Areata	6	9	47
Total cases	44	67	500
Controls	20	23	500
P value <0.05(compared with controls)	Present 0.00193	Present 0.000001	

In alopecia areata there were 47 cases among which nine had depression and six had anxiety. Almost equal number of male and female had both anxiety and depression as shown in table 4 and 5.

Table 4 – Analysis of Anxiety according to Gender

Diagnosis	Male	Female	Total
Androgenic Alopecia	6	11	17
Telogen Effluvium	5	7	12
Premature graying	6	3	9
Alopecia Areata	3	3	6
Total cases	19	25	44
Total controls	6	14	20
Total number of cases and controls	200	300	500

Table 5 – Analysis of depression according to gender

Diagnosis	Male	Female	Total
Androgenic Alopecia	10	18	28
Telogen Effluvium	8	9	17
Premature graying	6	7	13
Alopecia Areata	4	5	9
Total cases	28	39	67
Total controls	9	14	23
Total number of cases and controls	200	300	500

The prevalence of anxiety and depression was 12.7 and 19 percent as shown in table 6.

Table 6 – Prevalence of anxiety and depression in our study

Diagnosis	Anxiety (%)	Depression (%)
Androgenic Alopecia	7.2	11.2
Telogen Effluvium	3.9	15.7
Premature graying	9.4	13.6
Alopecia Areata	12.7	19
Total cases	8	13.4
Controls	4	4.6
Male	9.5	14
Female	8.3	13

Sum total of both anxiety and depression is approx 30 percent which hence is a huge burden of psychological illness.

Our study included 250 cases of androgenetic alopecia, owing to increased prevalence of this condition in this age group of 18-45 years. Anxiety prevailed in 7.2 percent and depression in 11.2 percent of cases which was significantly higher than in control group. Female outnumbered male in total and also had more depression than male in this category.

Telogen effluvium was also found positively correlated with total of 108 cases, 12 had anxiety and 17 had depression.

Premature graying which is present in this age group also had a positive correlation with 9 cases of anxiety and 13 of depression out of 95 cases.

There were 200 male and 300 female in cases hence controls were taken accordingly same, from healthy population, 200 male and 300 female, after eliminating gender and age bias, total 20 had anxiety and 23 had depression, more of which were females. Prevalence of anxiety and depression with HADS score of more than 11, in controls were 4 and 4.6 percentages respectively.

DISCUSSION:

Hair cycle responds to stress and it has already been proven in various studies. [5] In our study we have tried to establish underlying psychological cause of stress. We have analysed anxiety and depression association with hair diseases which affects quality of life of individual. Health is defined by World Health Organization includes not only physical but also mental fitness. In country like India, psychological illness is still a taboo. Hence, rarely it may manifest as one or the other physical disease, cause of which is usually defined as a functional component of that disease. Physical signs pointing towards psychological illnesses can be vice versa as well. For example, alopecia areata leading to stress which leads to aggravation of disease and hence process goes on.

There have been many studies on hair loss and psychological symptoms. [24, 25] We reprinted a table of psychological symptoms in patients with hair loss which was studied by psychologists and modified after van der Donk et al (1991). [5] It is shown in table 2.

Table 2 - Common psychological symptoms in hair loss patients- Modified after van der Donk et al (1991) Cash et al (1993), Franzol et al (1990), and Girman et al (1999)

•Shame	• Feeling uncomfortable
• Anger	• Dissatisfaction with body image
• Embarrassment	• Feeling of being older
• Humiliation	• Sense of inadequacy
• Disgrace	• Loss if self-confidence
• Hate	• Unhappy about appearance
• Disgust	• Reduced worth
• Fright	• Feelings of helplessness
• Sadness	• Self-consciousness
• Depression	• Social stress
• Worrying	• Powerlessness
• Frustration	Reduced social acceptance

Hereby, addressing psychological component is equally essential in disease management. There are many proven associations of anxiety and depression with acne, psoriasis, atopic dermatitis and in almost all studies correlation has been positive. [6, 7, 8, 32] We did study of hair loss with anxiety and depression which is the first study of its kind in central India. We compared anxiety and depression of study population with general population of same locality.

We used HADS scale which has an efficient screening value and is used as an important tool for the same. The score is used in analyses of dermatology outpatients and general practice settings and found to have good sensitivity and specificity for the diagnosis of depression and anxiety. In a Chinese study published in 2018 on Rosacea patients, the total DLQI score of patients was positively related with anxiety ($r = .526$, $p < .001$) and depression scores ($r = .399$, $p < .001$) in HADS. [9] In another study on acne, the analysis was done by HADS on comparison of anxiety and depression in patients with acne vulgaris and healthy individuals. [10] The HADS consists of 14 questions, with 7 depression-related questions and 7 anxiety-related questions. The 14 items are answered on a 4-point scale, where 0 represents the absence of the symptoms and 3 represents extreme symptoms. Higher scores on each section HADS-D and HADS-A reflects higher levels of depression or anxiety, respectively. In original calculation used by Zigmond and Snaith scores are classified as normal (0–7 of 21), borderline abnormal (8–10 of 21), and abnormal (11–21 of 21). [4, 13, 14, 15] We used scores of anxiety and depression with values more than or equal to 11 as was done in many other studies. [5]

Maximum prevalence of anxiety and depression was seen in Alopecia areata. In a prospective study by Colon EA et al 39 percent life time prevalence of depression was present in alopecia areata. [11] Anxiety and mood disturbances are frequently present with AA and may result in reduced self-esteem and may have a negative impact on quality of life (QOL) was a conclusion of study done by Al-Mutairi N et al.

[12] Another study done in China in 2011 also stressed on the impact of stress in alopecia areata. [16] We found a similar association in our study, with six out of forty-seven patients having anxiety and nine having depression.

Out of the 108 cases with Telogen effluvium, anxiety was present in 3.87 percent and depression was seen in15.7 percent. There have been many studies on telogen effluvium in which stress has been found a consistently related factor. Explanation to this theory has been given as anxiety or depression manifest as stress to patient which leads to fright, flight, fight response and hence adrenal gland is activated and releases stress hormones like substance P, neurokinin (NK - 1), corticotrophin releasing hormone (CRF), central hypothalamic stress hormone, and stress associated nerve growth factor (NGF) which leads to conversion of anagen to telogen which sheds later and disease is labeled as telogen effluvium. [27, 29, 30]

One contrary mechanism was also proposed by Slominski et al as "skin – stress system" in which hair follicle itself can generate an abundance of stress mediators and receptors which modulates stress responses at the local level. [19]. Novel theory of neurogenic inflammation leading to hair loss and hair follicle as a source of inflammation is still being studied. This whole term has been renamed as "Brain- hair follicle axis" which was proven in experiments on mice in study by Arck P.C. et al. [17]

Premature graying was more associated with depression in our study. Aging of hair follicle refers to reduced melanocyte function (known as graying). Also in natural aging there is a "50" rule of thumb (at least 50% of individuals have 50% gray hair by the age of 50 years) published in 2012. [20]

The cause of premature graying is more correlated with the release of oxidants, which can also be released from stress, which cause damage to bulge region and as well to melanocyte precursor cells like SOX10PAX3, SOX10, DCT and their receptors like TYR, TYRP1, MITF, PAX3, POMC, KIT. [26, 31] This was shown in mice as markedly decreased cells and receptors in un-pigmented mid-segments of hair compared with their pigmented segments by Ying Shi et al. [21]

Among 250 cases of androgenic alopecia 7.2 percent had anxiety and 11.2 percent had depression. Depression and anxiety both were seen more in females. p value was significant as 45 patients in total had marked anxiety and depression in HADS. Psychosocial impact of hair loss in patients of androgenic alopecia is of importance and many patients deal with this stress by two coping mechanisms Pro-adaptive and Mal- adaptive. Maladaptive coping mechanism usually leads to anxiety and depression which triggers the inflammatory cascade and brain- hair bulb axis. The prevalence of anxiety and depression was higher than general population. [5, 21, 28]

Hair has always been of more importance for cosmetic grooming not only in India but also in various other cultures and various eras in past. Decoration, styling and showing as a symbol of youthfulness has led to psychological issues in young people with androgenic alopecia. There has been a study according to Hamilton scale and following groups were compared: (i) no AGA; (ii) modest to moderate AGA; and (iii) extensive AGA. The conclusion was that greater percentages of men with more vs. less extensive hair loss (59% vs. 31%) reported stress due to AGA. Patients with more extensive AGA were also more preoccupied with their hair loss and were coping with it constantly. Hereby, the conclusion was similar to our study that it is essential to treat not only physical aspects but also mental aspects of the hair loss disorders. [22]

Control prevalence in our study, was same as seen in studies from parts of India, as well as by W.H.O. where approximately 4.5 percent suffer from major depression and 3 percent with anxiety in a given year and approx 15 percent and 20 percent in a lifetime. In our study, 4 percent had anxiety and 4.6 percent had depression this was concordant with W.H.O. According to W.H.O. in 2017 it is around 5 percent in world and maximum prevalence is seen around 60-70 years. Anxiety, according to W.H.O. is 4.5 percent around in world, and age of prevalence is 30- 60 years. It also varies according to the area, more in developed countries, less in developing countries. [23]

CONCLUSION:

Our study has shown significant correlation of both anxiety and depression with a well proven HADS scale for various common hair loss disorders. This observation also has a molecular basis of brain- hair follicle axis and skin- stress system in which various inflammatory mediators are released which leads to chain reaction of hair loss and stress. This should be beneficial in treating patient as a whole covering skin, hair as well psychological aspect to reduce the suffering of disease.

LIMITATION – Cause and effect relationship could not be established that is if anxiety and depression were preceding or succeeding hair fall could not be made out as it was an observational case control study to find correlation. Follow up after treatment could not be studied.

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