Baldness: A Diagnostic Physical Trait
In Mood Disorders – Sarvada Sign

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ABSTRACT

Physical traits and features, i.e., body build, colour of eye etc. are often utilized in making diagnosis of psychiatric and physical disorders. A study was carried out to investigate the relationship between baldness and mood disorders on psychiatric out patients, Department of Psychiatry, King George’s Medical University, Lucknow, and their available first degree relatives. In this study, 371 psychiatric patients and their first degree relatives were assessed and evaluated. 56.6% male bald patients were found to be suffering from mood disorders. In comparison to male patients of other psychiatric disorders, the relationship between baldness and mood disorders was found to be statistically significant (P<0.001). Though higher percentage of female patients with mood disorders (10.9%) were observed to have baldness in comparison to a single patient with other psychiatric disorder (1.1%), the studied sample of bald female patients was too small to provide meaningful leads. When baldness was studied in selected group of first degree relatives of the index male patients, baldness was observed to be significantly more common in the first degree relatives of mood disorder patients than the first degree relatives of other psychiatric disorder patients. Baldness is being designated as “Sarvada Sign”.

Key Words: Baldness, physical traits, mood disorder.

Introduction

The normal body traits such as body build, baldness, body-colour, hair-colour, eye-colour etc., have been described (Lea and Febiger, 1989); however, their phenomenological significance remains unexplained. One body trait, the body build, has been studied in relation to psychiatric illnesses by Sheldon et al., (1940) & Kretschmer (1936) for their diagnostic significance in psychiatric illnesses but other traits have hardly ever been studied by the behavioural scientists. Some physical features and measurements are used by anthropologists for assessing criminals and criminal behaviour (Lombroso, 1911 & Hooton, 1939). An important body trait is baldness and there are reports in literature, which have indicated association of baldness and psychological problems especially loss of self-esteem and depression. However, in day to day observations, bald people appear to be more active, agile, pushing, enterprising, risk taking and usually are high achievers. They are more endowed with qualities of extroversion and sociability. However, if they develop psychiatric illness, it is usually a mood disorder. Is baldness a sign of vulnerability to develop mood disorders? The issue is worth investigating. Eckert (1976) found that diffuse hair loss in women was associated with depression, introversion, neuroticism and loss of self-esteem. Pamela et al. (1995) found correlation of hair loss in males with psychiatric problems, e.g. lowered self esteem, depression, introversion, neuroticism and feeling of unattractiveness. The studies have shown that bald persons have depressive symptomatology as sequelae to hair-loss and literature on depression shows that biological changes in the brain are similar irrespective of type of depression i.e. exogenous or endogenous (Reid and Stewart, 2001). Bald people usually have negative perception about themselves (Greenberg, 1955; Toback & Rajkumar, 1970). Tiwari (2001), noted an association between androgenetic baldness and mood disorders. After an observation of more than 5 years, he is now able to quickly diagnose patients of mood disorders, if baldness is present either in the index subject or in first-degree relatives. This reported and observed relationship between baldness and mood disorders (Pamela et al., 1995, Eckert J., 1975 & Tiwari, 2001) generated a research idea to scientifically study the issue. This study was, therefore, planned to investigate the relationship between baldness and mood disorders.

Materials and Methods

This study was planned and carried out on the first 10 new outdoor patients registered on a specified day (Tuesday) in...
the Department of Psychiatry, King George’s Medical University, Lucknow, who were either drug naïve or taking medication for not more than one month on the day of evaluation. These patients were identified and studied during Nov.25’01 - Nov.5’02. The sample consisted of 371 psychiatric patients in the age range of 17-60 years, irrespective of baldness and sex.

Bald patients having hair-loss grade –III or more as per Hamilton- Norwood classification for male and female both and hair loss of type –I or more as per Ludwig classification of baldness only for females were defined as bald patients, as shown in the figures below. Subjects of androgenetic baldness only were included in the study and all other types of baldness were excluded.

Figure -I

Androgenetic type of Alopecia among males
(Hamilton-Norwood Classification of Baldness)

The androgenic type of alopecia has been categorized into different types by Hamilton (1951) and later modified by Norwood in 1975 and is known as Hamilton – Norwood classification of baldness for males. The classification is based on the loss of hair anteriorly and/or on the vertex as well as with the position of the hairline in relation to the external auditory meatus. Grade III alopecia is defined as an extension of triangular area of baldness posterior to a line which is 2 c.m. anteriorly to a line drawn in the coronal plane between external auditory meatus (Figure-I).

Ludwig (1977) arbitrarily arranged the pattern of female hair loss into three basic types. Hair loss grade-1 or more as per Ludwig classification of baldness for females were included for the study (Figure-II).

Those who did not fulfill these criteria were categorized and included as non-bald patients. Patients having hair loss due to scalp infection, injury, congenital hair loss (hair loss since birth or childhood), patchy hair loss (e.g. alopecia areata, trichotillomania), hair loss due to drug intake (β-blockers, cytotoxic drugs, ethionamide, fluconazole, heparin, lithium, valproate, fluoxetine, oral contraceptive withdrawal) were excluded. Besides above types of hair loss, subject having deafness and blindness were also excluded.

The finally included sample was then studied for their socio-demographic profile and was subdivided into males and females. These subjects were then diagnosed employing ICD-10-DCR criteria and classified into two groups: i) Mood Disorder and ii) Other Psychiatric Disorder patients. The male and female subjects were divided into bald and non-bald groups, employing Hamilton-Norwood and Ludwig classifications.

In addition, family pedigree study was done to establish genetic link, if any. A family pedigree chart was prepared for the index patients. The index patients and their attendants were then shown the photographs of the two classifications of baldness for the purpose of marking baldness on the pedigree charts. Atleast one or two first degree relatives, who were marked positive for baldness on pedigree chart by the index patient or attendant, were requested to come for assessment of baldness. Since it was not possible and feasible to study all first degree relatives of all the index subjects, it was decided to take first 20 index cases of bald male, non-bald male, bald female and non bald female subjects from both diagnostic groups i.e. Mood Disorders and Other Psychiatric Disorder groups for the study of baldness in the first degree relatives. It was also ensured that only those first degree relatives, who were marked positive for baldness and who could easily come for the study were called. Among the bald females only 6 bald
females were included for pedigree study, because out of total 9 bald females, first degree relatives of only 6 patients who were marked for the presence of baldness on pedigree chart could come to the hospital for the evaluation of baldness. These first degree relatives were evaluated only for the presence or absence of baldness. They were not subjected to any kind of psychiatric assessment.

The test of significance used was chi-square test. If in a 2 x 2 contingency table, any cell was having an observed frequency of less than 5, then Yates correction was applied to test the significance.

Observation & Results:

A total number of 1476 new patients attended the adult psychiatric OPD on Tuesdays from 25 November, 2001 to 05 November 2002. Of these at the rate of first 10 new patients on each OPD, 412 patients were included and screened for inclusion in the study and the remaining 1064 patients were not screened. Out of 412, 41 patients did not fulfill criteria and were excluded. Rest of 371 patients were studied.

Sample Characteristics : With regard to socio-demographic characteristics of the study subjects, maximum number of patients (63.1%) belonged to age group 21-40 years. 56.1% were males and 43.9% were females. Majority were Hindus (59.8%), 69% patients came from rural background and rest were from urban background. More than half (66.1%) lived in joint families and rest in nuclear families. Majority (77.6%) were married. 31.5% patients belonged to the income group under Rs. 3000/- per month and 50.9% between Rs 3000-6000 per month, while 17.5% patients belonged to income group more than Rs 6000/- per month. 57.2% patients had received education less than high school. In terms of occupation, 37.5% patients were housewives, 14.8% servicemen, 8.4% businessmen, 15.9% farmers, 10.2% laborers and 13.2% were students.

Diagnostic distribution of study subjects : Table-I gives diagnostic distribution of study subjects:

Table-I depicts the diagnostic distribution of male and female patients. Out of 208 male patients, 99 (47.6%) patients were diagnosed as suffering from mood disorders, while 109 (52.4%) from other psychiatric illnesses. Among 163 female patients, 73 (44.8%) were suffering from mood disorders and 90 (55.2%) were diagnosed as other psychiatric disorders. Statistically no significant difference was observed with regard to diagnostic distribution (mood disorders Vs other psychiatric disorders) in male and female patients (X² = 0.3960; d.f=1; p>0.50).

Distribution of Baldness in Male Patients : Table-II below gives distribution of baldness in male patients:

Table-II shows presence of baldness in male patients. Fifty six (56.6%) patients of mood disorders and 33 (30.3%) patients of other psychiatric disorders were bald and baldness was of significantly higher in mood disorder patients (χ² = 14.65; p<0.001). Among the patients of other psychiatric disorders, patients of schizophrenia and acute and transient psychotic disorders were 34 and out of them only 7 (20.6%) were bald. Patients of rest of the disorders were 75 and out of them, 26 (34.7%) patients were bald. So baldness was less frequent in male patients of psychotic disorders i.e. schizophrenia and acute psychotic disorders, compared to male patients of other psychiatric disorders (excluding schizophrenia and acute psychotic disorders),
Table- II
Distribution of Baldness in Male Patients

| Diagnosis                              | Baldness present | Baldness not present |
|----------------------------------------|------------------|----------------------|
| **a - Mood disorders**                 |                  |                      |
| Manic episode                          | 11               | 7                    |
| Bipolar affective disorder             | 29               | 22                   |
| Depressive episode                     | 11               | 9                    |
| Recurrent depressive disorder          | 03               | 05                   |
| Dysthymia                              | 02               | 0                    |
| **Total**                              | 56(56.6%)        | 43(43.4%)            |
| **b - Other psychiatric disorders**    |                  |                      |
| Panic disorder                         | 02               | 04                   |
| Generalized anxiety disorder           | 04               | 05                   |
| Mixed anxiety and depressive disorder   | 04               | 03                   |
| Obsessive compulsive disorder          | 07               | 14                   |
| Adjustment disorder                    | 0                | 03                   |
| Dissociative disorders                 | 01               | 07                   |
| Somatoform disorders                   | 01               | 08                   |
| Schizophrenia                          | 03               | 12                   |
| Acute and transient psychotic disorders| 04               | 15                   |
| **c - Mental and behavioural disorders due to psychoactive substance use** | 07               | 05                   |
| **Total**                              | 33(30.3%)        | 76(69.7%)            |

though the difference was statistically insignificant ($\chi^2=2.2$; df=1; p>0.20).

Distribution of Baldness in Female Patients:

Table-III gives distribution of baldness in female patients:

Among the female patients, 8 (10.9%) patients of mood disorders were bald, while 65 (89.1%) patients of mood disorders were non-bald (Table-III). One (1.1%) patient of other psychiatric disorder was bald, while rest of the patients, 89 (98.9%) of other psychiatric disorders were non-bald. Non-bald were significantly higher in other psychiatric disorder group (Fisher’s exact test: p=0.0118). However, the sample of bald female patients was too small to draw a meaningful conclusion.

Pedigree Study

80 male patients consisting of 40 bald and 40 non-bald and 46 female patients consisting of 6 bald and 40 non-bald were recruited whose first degree relatives were easily available. In terms of diagnosis, there were 20 patients each of mood disorder group and other psychiatric disorders group in both bald and non-bald male patient groups. There were 5 bald females in mood disorder group and one in other psychiatric disorder group. However, non bald females were 20 each in mood disorder and other psychiatric disorder group.

Presence of baldness in at least one of the first degree relatives of bald male patients:

Table-IV gives presence of baldness in at least one of the first degree relatives of bald male patients:

Table-IV depicts at least one of the first degree relatives of 20 (100%) patients of mood disorders and 14 (70%) patients of other psychiatric disorders were bald, and baldness was significantly higher in the first degree relatives of mood disorder patients ($X^2=7.06$, df=1; p<.01).
Presence of baldness in at least one of the first degree relatives of non-bald male patients:

Table-V below gives presence of baldness in at least one of the first degree relatives of non-bald male patients:

As shown in table-V, similar observations were found for the non-bald male patients as for the bald patients. At least one of the first degree relatives of 19 (95%) patients of mood disorders and 14 (70%) patients of other psychiatric disorders were bald. Baldness was significantly higher in the first degree relatives of non-bald patients of mood disorders (Fisher’s exact test; p=0.045).

Presence of baldness in at least one of the first degree relatives of non-bald female patients:

Six index bald female subjects (5 of mood disorder and one of other psychiatric disorder) were recruited for the pedigree study (Table-VI). Of these, in 80% of the first degree relatives of 4 mood disorder bald female patients, baldness was present. In remaining one subject’s relative baldness was not present. In one other psychiatric disorder group female bald subject, none of the first degree relatives were bald.

Presence of baldness in at least one of the first degree relatives of non-bald female patients:

In case of non-bald female patients 20 subjects were recruited for the pedigree study in each group (Table-VII). Their first degree relatives were invited. In case of mood disorder group at least one of the first degree relatives was bald in 19(95%). In other psychiatric disorder group in 13(65%) of the first degree relatives baldness was present. The difference in the frequency of presence of baldness between first degree relatives of mood disorders and first degree relatives of other psychiatric disorders was found to be statistically significant (X^2=5.625, df=1; p<.05).

Discussion

Baldness (androgenetic baldness) and mood disorders have not been studied so far to the best of our knowledge to find out their relationship. The clinical observation that baldness is common in mood disorder patients (Tiwari, 2001) indicated that there may be some kind of relationship between these two conditions. The genetic transmission of affective disorders is not clearly understood, similar to that of baldness. In mood disorders several loci have yielded modest evidence for linkage, which is being independently replicated in multiple data sets. However, as of date transmission of mood disorders are hypothesized to be of multi-factorial in nature (Falconer, 1965). On the other hand for baldness, not much literature is available and the multi-factorial inheritance has been envisaged by Salamon (1968). Further, the phenotypic manifestations of baldness and mood disorders appear at variable ages from early life to old age. All these provided a background to undertake this study.

A sample of 371 patients was recruited and patients were diagnosed according to ICD-10-DCR. The socio-demographic variables were studied. Most of the patients (63%) belonged to the age group of 21-40 years and majority (56%) was males. Most of them were Hindus from rural
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background and belonged to joint families. More than half were educated below 10th standard and majority fell in the family income group of Rs. 3000-6000 per month. Later on, patients were broadly grouped into mood disorder and other psychiatric disorder groups. As the baldness pattern and frequency is different among males and females, the sample was also divided into male and female groups, and then was studied for presence or absence of baldness in mood disorder and other psychiatric disorder groups. The data were compared for significance by chi-square test using fisher’s exact probability test. In the male patients of mood disorder, baldness was common (56.6%), while baldness was not so frequent in patients of other psychiatric disorders (30.3%). The difference was statistically significant (p<0.001). In other psychiatric disorders, baldness was least frequent in patients of schizophrenia and acute and transient psychotic disorders (20.6%).

Similarly, when the female patients were evaluated for baldness, the baldness was not seen frequently in females. Only a small sample of 9 (12%) females was found to be bald. However, the sample of bald females was too small to draw any meaningful conclusion.

The observations from the family pedigree study have shown that baldness was present in at least one of the first-degree relatives of all bald male patients of mood disorder (100%). Similarly baldness was present in the first-degree relatives of 95% non-bald male patients of mood disorders, while the baldness was present in at least one of the relatives of 70% bald male patients of other psychiatric disorders. When the bald females’ relatives were studied, the number of bald female patients was too small to draw any meaningful conclusion. Baldness was present in at least one of the first degree relatives of 95% non-bald females of mood disorder patients which is more than other psychiatric disorder patients’ first degree relatives (65%). Baldness, thus, as a physical trait, which was earlier named as “Tiwari Sign” in mood disorders is, now being named as “Sarvada Sign”.

This is a new area of enquiry and we do not have data from literature to compare our findings. From the discussions above, it is obvious that baldness is more commonly seen in subjects of mood disorders as compared to other psychiatric disorders. This observation attains more significance, if first-degree relatives of mood disorder patients are taken into consideration. The baldness was found 100% in the first-degree relatives of bald mood disorder patients and 95% in of the non-bald mood disorder patients. The non-bald female patients of mood disorders showed similar pattern. These observations were statistically significant. The enquiry has indicated that in most of the cases of mood disorders, baldness was present either in the index subject or in any of the first-degree relatives, irrespective of the gender. ‘Sarvada Sign’ was found positive in 65-70% amongst one of the first degree relatives of patients of other psychiatric disorders of either gender.

The androgenetic alopecia, which has been the focus of the study in this enquiry, is due to high levels of testosterone. The testosterone levels in the patients of depression has been controversial issue. Vogel et al. (1978) found a significantly lower testosterone and free testosterone in depressed males. However, other studies failed to show a similar pattern (Levitt et al., 1988; Driscoll et al. 1993). In literature we could not search any reference about the testosterone levels in mania. However, there is a report wherein testosterone was given to normal individuals, which caused hypomanic/manic symptoms (Tricker et al., 1996). The results indicate that at this point, no definitive statement can be made about the relationship between testosterone and mood disorder. Since androgenetic alopecia is reported to be because of increased levels of testosterone, how it is found to be associated with mood disorders, where testosterone levels remain within normal limits is a crucial question. Are these two independent phenomena? Does occurrence of significant baldness in either index patient or in any of the first-degree relatives of mood disorder patients’ points out towards a different story? There appears to be some link either at the hormone level or at the genetic level that the two conditions co-exist in the same patient.

In this study, in view of the above, a natural question arises. There are many people in the society having androgenetic baldness but many of them do not develop diagnosable mood disorders. The question is, if androgenetic baldness is associated with mood disorders why not all such bald suffer from mood disorders. Another important observation (Tiwari, 2001) relates to findings of baldness in some patients suffering from neurotic and stress-related disorders. This adds another dimension to the whole issue. These questions can be answered only by a well-planned study taking into consideration, genetic and biochemical aspects besides phenomenological aspects.
References

Driscoll, R. and Thompson, C. (1993) : Salivary testosterone levels and major depressive illness in men. British Journal of Psychiatry, 163; 122-123.

Eckert, J. (1976) : Diffuse hair loss in women: The psychopathology of those who complain. Acta Psychiatrica Scandinavica. 53 (5): 321-327.

Falconer, D.S. (1965) : The inheritance of liability to certain diseases, estimated from the incidence among relatives. Annals of Human Genetics; 29:51.

Greenberg, S.J. (1955) : Alopecia areata; Psychiatric survey. Archives of Dermatology; 72:454-58.

Hooton E. A. (1939) : The American Criminal: An Anthropological study (Cambridge Mass: Harvard University press)

Kretschmer, E., (1936) : Physique and character, 2nd ed revised Miller, London. Routledge, 69:191, 155.

Lea and Febiger (1989) : Nora and Fraser’s book, Medical genetics. Principals and practice, chapter 9, "Normal traits", Third edition, Philadelphia, 1989 ISBN 0-81-21-1165-6.

Levitt, A. J. and Joffee, R. T. (1988) : Total and free testosterone in depressed men. Acta Psychiatrica Scandinavica. 77:346-346.

Lombroso, C. (1911) : Crime, its causes and remedies, Trans, H.P. Horton (Boston: Little, Brown).

Ludwig, E. (1977) : Classification of the types of androgenic alopecia (common baldness) arising in female sex. British Journal of Dermatology. 37: 249-256.

Norwood, O’T.T. (1975) : Male pattern baldness classification and incidence. Southern Medical Journal. 68: 1359-1370.

Pamela, W. A., Wells, T. W. and Robin, J. H. Russell (1995) : Does fortune favour the bald? Psychological correlation of hair loss in males. British Journal of Psychology. 86: 337-344.

Reid, I.C. and Stewart, C. A. (2001) : How antidepressant work: New Perspectives on the pathophysiology of depressive disorder. British Journal of Psychiatry 178: 299-303.

Salamon, T. (1968) : Genetic factors in male pattern alopecia. In: Baccareda-Boy A, Moretti, G, Frey JR, eds. Biopathology of pattern alopecia. Basle: Karger, 39-56.

Sheldon, W.H., Stevens, S.S. and Tucker, W.B. (1940) : The varieties of human physique. London, Harper. 63.

Tiwari, S. C. (2001): Personal communication. Professor in Neuropsychiatry, Department of Psychiatry; K. G’s Medical College, Lucknow, India

Toback, C and Rajkumar, S (1970) : The emotional disturbances underlying alopecia areata, alopecia totalis and trichotillomania. Child Psychiatry and Human development. 10:114-17

Triker R, Casaburi R, Storer TW, Clevenger B, Berman N, Shirazi A, Bhasin S(1996) : The effect of supraphysiological doses of testosterone on angry behaviour in healthy eugonadal men. Journal of Clin Endocrinology and Metabolism 181: 37-54.

Vogel, W., Klaiber, F. L., Broverman, D. M. (1978) : Roles of gonadal steroid hormones in psychiatric depression in men and women. Progressive Neuro-psychoendocrinology, 2: 487-503.