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The relationship of psychopathology and hyperhidrosis

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Summary

Background Hyperhidrosis is a common yet poorly understood disease that is often exacerbated by emotional stress. While a psychiatric explanation of causality is frequently offered, there is little evidence to support or reject the view that the condition is primarily an anxiety-based disorder.
Objectives To quantify objectively the degree of psychopathology in patients with hyperhidrosis.
Methods Forty-two patients diagnosed as having hyperhidrosis were examined prior to endoscopic sympathectomies. All patients took the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) and State-Trait Anxiety Inventory (STAI) before surgery. Results were compared with established norms.
Results The group scored well within established norms on both psychometric measures. On scales measuring anxiety, depression and conversion phenomena, 88% of the MMPI-2 profiles lacked elevations, and 86% of the patients lacked elevations on the STAI State and Trait Anxiety scales. Personality variables were not associated with postsurgical outcome.
Conclusions Most individuals suffering from essential hyperhidrosis lack overt psychopathology. While some patients subjectively describe symptoms of anxiety, mild depression and social isolation, these complaints appear often to be in reaction to or superimposed upon an organic disease process and not the primary cause of their condition.

Key words: hyperhidrosis, psychopathology

Severe primary hyperhidrosis is characterized by uncontrollable sweating. It is estimated to affect up to 1% of the general population,[1] and negatively affects quality of life and social functioning.[2] Despite recent interventional treatments that reduce or eliminate symptoms of hyperhidrosis,[3,4] the true aetiology of this syndrome remains unknown. Many standard psychiatric texts conceive of this disease as 'an anxiety phenomenon mediated by the autonomic nervous system',[5] and assert that a 'large number' of patients with hyperhidrosis are 'anxiety-ridden' individuals.[6] Such hypotheses are presently conjecture, as the scientific literature solely consists of 'reviews' of the limited research augmented by clinical experience that ascribe a psychiatric aetiology for this disorder,[7,8] and case reports of symptom reduction through psychotherapy.[9,10] Two studies have systematically assessed psychopathology in hyperhidrosis and have yielded mixed results due to small sample sizes and the utilization of suboptimal measures of personality.[11,12] The purpose of this study was to investigate the personality functioning of individuals consecutively referred for surgical treatment of severe hyperhidrosis using sensitive, standardized psychometric instruments and to examine the impact of psychopathology on post-transthoracic endoscopic sympathectomy outcome.

Patients and methods

Forty-two consecutively referred individuals diagnosed as having essential hyperhidrosis consented to participate in this survey, which was approved by the Temple University Hospital Institutional Review Board. Participants comprised 19 men and 23 women of age range 13–68 years (mean 29·9). All received the Minnesota Multiphasic Personality Inventory-2 (MMPI-2), a highly reliable and valid measure of personality.[13]

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The MMPI-2 yields three scales of test validity and 10 scales measuring somatic preoccupation, depression, antisocial attitudes, deviant and paranoid thinking, anxiety and social introversion/extroversion. The MMPI-2 has a large standardization sample (2600 normal individuals) and yields uniform *t*-scores for each clinical scale, with > 65*t* considered clinically significant. In addition, the State-Trait Anxiety Inventory (STAI), which assesses situational vs. characterological anxiety, was administered.[14] The STAI is also reliable, valid, and standardized in over 6000 normals and 800 individuals with psychiatric diagnoses to yield the age-stratified cut-off scores utilized for comparison with the participant's test results.

Thirty-three of 42 (79%) initially evaluated individuals were approved for the procedure by their insurance companies and underwent endoscopic sympathectomy. Follow-up telephone survey was conducted at a mean 16 months postsurgery (range 4–33). Patients were asked to rate on a 1–10 scale their degree of compensatory sweating and their satisfaction with the surgical results. Spearman correlations were calculated between the psychometric variables and the patients' rankings of compensatory sweating and satisfaction. Individuals were also placed into groups of high (7 or above) or low (6 or below) compensatory sweating and surgical satisfaction, and analysis of variance was conducted on the psychological variables across these groups. Finally, those with elevated MMPI-2 or STAI anxiety scales were compared against individuals with normal profiles regarding postsurgical compensatory sweating and satisfaction.

Results

Most participants (37 of 42; 88%) produced normal results on MMPI-2 scales measuring psychological symptoms commonly associated with hyperhidrosis, e.g. somatic concern, anxiety, depression and social isolation (Table 1). Three patients with elevated MMPI-2 anxiety scale scores produced these results due to an apparent reactive depression. Most individuals (36 of 42; 86%) evidenced scores in the normal range when compared with age- and sex-matched peers on the STAI State and Trait Anxiety scales.

Regarding outcome, approximately half (16 of 33) of the patients rated their compensatory sweating as moderate or high, yet most (25 of 33) were satisfied with the results of the surgery. None of the psychological variables correlated with the patient's ratings of compensatory sweating or satisfaction, nor were there any psychological differences present between groups who reported either (i) high or low compensatory sweating or (ii) high or low satisfaction with the surgical outcome. The small number of individuals with elevated anxiety scale scores did not rate their surgical outcome as significantly different from that in those with normal psychological test results.

Table 1. Percentage of participants above the cut-off and descriptive statistics for Minnesota Multiphasic Personality Inventory-2 clinical scales

Scale	*n*	Percentage	Mean ± SD	Range
1 Hypochondriasis	1	2	49·8 ± 10·6	32–73
2 Depression	3	7	49·3 ± 10·7	32–74
3 Conversion hysteria	5	12	54·7 ± 9·1	38–78
4 Psychopathy	1	2	50·1 ± 7·1	36–69
5 Masculinity-femininity	11	21[a]	55·8 ± 13·9	30–89
6 Paranoia	1	2	50·6 ± 7·8	36–75
7 Psychasthenia (anxiety)	5	12	53·4 ± 10·6	34–78
8 Schizophrenia	2	5	50·1 ± 8·1	37–70
9 Hypomania	3	7	52·6 ± 11·0	35–83
10 Social introversion	4	10	49·6 ± 11·7	30–77

[a] Eleven women of high socioeconomic status were unexpectedly elevated on the Masculinity-femininity scale, which measures a lack of conformity with the 'traditional' female role, a finding that is considered clinically non-significant.

Discussion

Our preliminary data suggest that most individuals suffering from essential hyperhidrosis lack overt psychopathology. While some patients subjectively describe symptoms of anxiety, depression and social isolation, these complaints often appear to be mild in nature and are most probably a reaction to the organic disease process as opposed to the primary cause of their condition. The majority (88%) of individuals in our sample, despite the severity of their sweating, evidenced completely normal psychological profiles and 86% showed no evidence of long-standing anxiety traits. In addition, there was no association between psychopathology and the patient's postsurgery degree of compensatory sweating or satisfaction with the procedure. Further investigation is under way to examine if the 12% of our sample that scored high on the MMPI-2 anxiety scale represent a group of individuals unique to hyperhidrosis or merely reflect the upper limits of the incidence of anxiety disorders in the general public. Such future research will also include a larger sample size to allow for more revealing statistical techniques (e.g. cluster analysis) and contain comparison groups of individuals with other dermatological conditions to

establish the base-rate of psychological comorbidity among dermatological disorders. These ongoing studies aim to reveal groups whose psychological profiles may have been artificially lowered secondary to a defensive test-taking style or because of a difficulty experiencing and verbalizing emotional distress (alexithymia), which is common in medical populations.[15,16] Still, this preliminary study suggests a much lower rate of psychopathology in hyperhidrosis, a condition with hypothesized psychiatric underpinnings, than that seen in other chronic medical conditions.[17]

In conclusion, our report suggests a low incidence of psychopathology in patients with essential hyperhidrosis. In addition, psychological factors had no association with patient outcome variables such as degree of compensatory sweating and postsurgical satisfaction. These preliminary conclusions argue against a common clinical model that hyperhidrosis is an expression of psychological distress. However, further research is needed, better to characterize the exact incidence of psychological disturbances in this condition and to determine if the emotional difficulties noted in some individuals had any causal relationship with their hyperhidrosis.

References

1 Adar R, Kurchin A, Zweig A, Mozes M. Palmar hyperhidrosis and its surgical treatment: a report of 100 cases. *Ann Surg* 1977; **186**: 34–41.

2 Amir M, Arish A, Weinstein Y *et al.* Impairment in quality of life among patients seeking surgery for hyperhidrosis (excessive sweating): preliminary results. *Isr J Psychiatry Relat Sci* 2000; **37**: 25–31.

3 Reisfeld R, Nguyen R, Pnini A. Endoscopic thoracic sympathectomy for treatment of essential hyperhidrosis syndrome: experience with 650 patients. *Surg Laparosc Endosc* 2000; **10**: 5–10.

4 Heckman M, Ceballos-Baumann AO, Plewig G. Botulinum toxin A for axillary hyperhidrosis (excessive sweating). *N Engl J Med* 2000; **344**: 488–93.

5 Engels WD, Wittkower ED. Allergic and skin disorders. In: *Comprehensive Textbook of Psychiatry* (Freedman AM, Kaplan HI, eds). Baltimore, MD: Williams & Wilkins, 1967; 1095.

6 Kaplan HI, Sadock BJ, eds. *Comprehensive Textbook of Psychiatry*, 4th edn. Baltimore, MD: Williams & Wilkins, 1985; 1180.

7 Engels WD. Dermatologic disorders: psychosomatic illness review. *Psychosomatics* 1982; **23**: 1209–19.

8 Lerer B. Hyperhidrosis: a review of its psychological aspects. *Psychosomatics* 1977; **18**: 28–31.

9 Drimmer EJ. Desensitization and benztropine for palmar hyperhidrosis. *Psychosomatics* 1985; **26**: 888–9.

10 Lerer B, Jacobowitz J. Treatment of essential hyperhidrosis by psychotherapy. *Psychosomatics* 1981; **22**: 536–8.

11 Lerer B, Jacobowitz J, Wahba A. Personality features in essential hyperhidrosis. *Int J Psych Med* 1980; **10**: 59–67.

12 Kwon OS, Kim BS, Cho KH *et al.* Essential hyperhidrosis: no evidence of abnormal personality features. *Clin Exp Dermatol* 1998; **23**: 45–6 (Letter).

13 Hathaway SR, McKinley JC. *Minnesota Multiphasic Personality Inventory-2*. Minneapolis, MN: University of Minnesota Press, 1989.

14 Spelberger CD. *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press, Inc., 1983.

15 Taylor G. *Psychosomatic Medicine and Contemporary Psychoanalysis*. Madison, CT: International Universities Press, 1987.

16 Taylor G. *Disorders of Affect Regulation: Alexithymia in Medical and Psychiatric Illness*. Cambridge: Cambridge University Press, 1997.

17 Singer H, Ruchinskas RA, Riley K *et al.* Personality styles and coping in end-stage lung disease. *Chest* 2001; **120**: 1246–52.