Original Article

Anxiety and Depression in Patients with Atopic Dermatitis in a Southeast Asian Tertiary Dermatological Centre

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Abstract

Introduction: This study aimed to assess the frequency of anxiety and depression in a cohort of adult patients with atopic dermatitis (AD) in a tertiary dermatological centre, using the Hospital Anxiety and Depression Scale (HADS). We looked for any correlation between anxiety and depression with skin disease severity. Materials and Methods: Patients with AD were recruited from the National Skin Centre, Singapore, from 2008 to 2009 for a prospective cross-sectional study. The scoring atopic dermatitis (SCORAD) grade was determined and the HADS was administered via interviews. Results: A total of 100 patients (78 males, 22 females) were enrolled (92% Chinese, 4% Malays and 4% Indians). Their average age was 25.7 years. Sixty-five percent used topical steroids, 14% had previously taken oral prednisolone for the control of disease flares, and 20% were on concurrent systemic therapy. The mean SCORAD was 55.0, with 99% of patients having moderate or severe AD. The mean HADS anxiety score was 7.2 and the mean depression score was 5.0. The level of anxiety correlated well with that of depression (Spearman's rank correlation coefficient, $\rho = 0.59$, $P < 0.05$); 18% were considered as cases of anxiety and 5% as cases of depression. These patients also had higher SCORAD values compared to other patients with lower scores for anxiety or depression ($P < 0.05$). Linear regression demonstrated a statistically significant positive relationship between anxiety and depression scores, and SCORAD scores. Conclusion: Our study identified, by means of the HADS, the frequency of anxiety and depression amongst a cohort of Singaporean patients with AD. More severe skin disease correlated to greater psychological burden. The HADS is a useful screening tool that can constitute part of the overall holistic management of patients with AD so as to improve patient care.

Ann Acad Med Singapore 2016;45:451-5

Key words: Eczema, HADS, Mood disorders, SCORAD

Introduction

Atopic dermatitis (AD) is a common skin disease that negatively impacts the physical and mental health of patients, particularly when the skin condition is more severe.[1] The psychological burden of AD may stem from sleep deprivation secondary to nocturnal pruritus, resulting in poor daytime concentration and petulant behaviour.[2] Being at the receiving end of bullying may also cause social embarrassment.[2] Due to the disease chronicity, the treatment journey often places substantial financial and time burden on patients.[3] This may strain interpersonal relationships as the lifestyle adjustments that AD patients make inadvertently affect close family members.[4]

Yaghmaie et al reviewed data from the 2007 National Survey of Children Health in the United States and found significantly higher odds of suffering from various mental health disorders in children with AD, with the lifetime prevalence of anxiety in those children reaching 7.25% and the corresponding number for depression reaching 6.52%.[5] Furthermore, the severity of skin disease alters the strength of the association.[5] The Hordaland Health Studies conducted in Norway in 1992 and 1997 showed that 12.9% of their cohort with AD had anxiety and 4.2% had depression as measured by the HADS.[6] A multicentre cross-sectional study conducted from 2011 to 2013 by Dalgard et al involving 4994 individuals in 13 European countries

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found that anxiety was present in 17.2% of patients with AD (compared to 11.1% in controls) and that depression was present in 10.1% of patients (compared to 4.3% in controls).[7] A South Korean group that studied conscripted males with AD in a military setting showed a prevalence of 9.8% with anxiety and 10.4% with depression.[8] Local data on psychiatric comorbidity in patients with AD is, however, lacking, and this bears important relevance to the subsequent delivery of clinical services.

The purpose of this study was to examine the relationship between psychiatric comorbidities (namely anxiety and depression) with the severity of AD in patients in Singapore. We hypothesised that anxiety and depression were more frequent in patients with more severe skin disease.

Materials and Methods

This prospective cross-sectional study was conducted from August 2008 to January 2009 at the National Skin Centre, Singapore. A total of 100 patients with AD between the ages of 13 to 60 years who visited the outpatient clinics within the study period were recruited. The Hanifin and Rajka criteria[9] for AD was used to ensure diagnostic consistency. Informed consent was obtained and the Institutional Review Board granted ethics approval. We excluded patients who were unable to understand the questionnaire sufficiently.

Assessment Tools

SCORing Atopic Dermatitis (SCORAD)

The SCORAD is a widely used clinical tool for quantifying the severity of AD in research and clinical practice.[10] It measures the extent, intensity and level of pruritus, and insomnia related to AD. Patients' SCORAD were determined objectively through physical examination, and also subjectively, including symptoms of itch and sleep loss. Scores were categorised into mild (<20), moderate (20 to 50) and severe (>50) grades.

Hospital Anxiety and Depression Scale (HADS)

The HADS was used to screen for anxiety and/or depression in our patients. It has been validated against structured psychiatric interviews in patients with dermatological diseases, and has good reliability and validity coefficients.[11] It comprises 2 seven-item subscales on the symptoms of anxiety and depression.[12] Each item has a 4-response category range, from 0 representing the absence of symptoms to 3 representing maximum symptomatology. The scale ranges between 0 and 21; a score of <8 is considered as no anxiety or depressive symptoms, 8 to 10 is considered as borderline anxiety or depressive symptoms and >10 is considered as prominent anxiety or depressive symptoms.

Patients' SCORAD were determined by clinicians involved in the study whereas HADS were assessed by research administrators. Neither group was aware of the findings of the other.

Statistical Analysis

One-way analysis of variance was used to compare means of 3 or more groups. Linear regression was used for normally distributed continuous outcomes in the multivariate analyses. A P value <0.05 was deemed significant.

Results

Females were fewer in numbers compared to males, with 78 males and 22 females recruited (Table 1). Their mean age was 25.7 years (standard deviation [SD] 10.1; range, 14 to 58 years). Of the patients, 92% were Chinese, 4% were Malays and 4% were Indians. A total of 15% of the study cohort had concomitant atopic conditions of asthma and/or allergic rhinitis. All had been prescribed topical steroids for treatment and 24% had previously been prescribed oral prednisolone for the treatment of severe flares. Twenty percent were on concurrent systemic immunosuppressants which included cyclosporine (10%), azathioprine (8%) and methotrexate (2%).

The mean SCORAD of the study cohort was 55.0 (SD 16.2; range, 15 to 96). One patient was scored with mild AD, 39 patients with moderate AD, and 60 patients with severe AD.

Based on the HADS, the mean score for anxiety in the study cohort was 7.2 (SD 3.7; range, 0 to 16) and the mean score for depression was 5.0 (SD 3.4; range, 0 to 14). Cronbach's alphas for the 7 anxiety items and 7 depression items were 0.78 and 0.73, respectively. The level of anxiety correlated well with the level of depression (Spearman's rank correlation coefficient, $\rho = 0.59$; $P < 0.05$); thus, a patient who scored higher for anxiety was likely to score higher for depression. Using the SCORAD score as dependent variable, linear regression established the following predictions from depression and anxiety scores. First, anxiety score could statistically significantly predict the SCORAD score ($F [1, 98] = 4.4.54$, $P = 0.037$) and anxiety score accounted for 4.3% of the explained variability in the SCORAD score. Second, depression score could statistically significantly predict the SCORAD score, ($F [1, 98] = 7.110$, $P = 0.0009$) and depression score accounted for 6.8% of the explained variability in the SCORAD score. The regression equation was: SCORAD score = 48.688 + 1.257 x (depression score) (Fig. 1). The regression equation was: SCORAD score = 48.406 + 0.916 x (anxiety score). In contrast, age could not predict the SCORAD score ($F [1, 98] = 1.159$, $P = 0.284$).

Table 1. Demographic and Clinical Data of the Study Cohort with Corresponding Mean SCORAD and HADS Scores

	Mean SCORAD	Mean HADS Anxiety Score (SD)	*P* Value	Mean HADS Depression Score (SD)	*P* Value
Gender					
Female (n = 22)	51.5	6.9 (4.0)	0.62	4.8 (4.0)	0.74
Male (n = 78)	56.0	7.3 (3.6)		5.1 (3.2)	
Ethnicity					
Chinese (n = 92)	55.2	7.0 (3.7)		5.0 (3.3)	
Malay (n = 4)	50.2	11.3 (2.8)	0.16	8.5 (4.2)	0.08
Indian (n = 3)	53.4	8.0 (3.5)		2.7 (2.9)	
Others (n = 1)	66.0	7.0 (-)		2.0 (-)	
Age of patients					
11 – 20 (n = 42)	53.7	7.5 (3.8)		4.5 (3.4)	
21 – 30 (n = 36)	55.5	7.3 (3.5)	0.98	5.4 (3.5)	0.78
31 – 40 (n = 12)	57.0	7.0 (4.3)		5.4 (3.6)	
41 – 50 (n = 4)	38.6	7.5 (2.5)		4.5 (1.0)	
51 – 60 (n = 6)	67.9	7.0 (4.0)		5.7 (2.9)	
Age at onset*					
<2 years (n = 23)	60.0	8.3 (4.4)		5.2 (3.6)	
2 – 4 years (n = 12)	57.8	5.8 (3.3)	0.15	3.3 (2.7)	0.13
>4 years (n = 60)	53.8	7.3 (3.4)		5.4 (3.4)	
Unknown (n = 5)	39.8	4.4 (2.5)		3.6 (1.3)	
Hospitalisations past month					
Yes (n = 4)	65.6	10.0 (3.4)	0.12	6.5 (0.6)	0.37
No (n = 96)	54.6	7.1 (3.7)		5.0 (3.4)	
Other medical problems					
Nil (n = 82)	53.8	7.2 (3.7)		4.9 (3.2)	
Asthma, rhinitis (n = 14)	60.9	7.4 (3.9)	0.97	5.5 (4.4)	0.84
Hypertension, diabetes, hyperlipidaemia, heart disease (n = 4)	59.3	7.0 (2.2)		5.3 (2.5)	

HADS: Hospital Anxiety and Depression Scale; SCORAD: Scoring atopic dermatitis

*Cases without known age of onset were excluded from statistical analysis.

Differences in gender, ethnicity, age, age of onset, history of hospitalisations or other comorbidities did not significantly impact HADS scores (Table 1).

Discussion

Based on the HADS, 18% of our patients had anxiety symptoms and 5% had depressive symptoms. These figures are comparable to those in international studies. Four percent of our patients scored positively for both anxiety and depression, and they may be impacted more emotionally as having concurrent anxiety and depression has been found to contribute to poorer mental health status compared with being afflicted with either condition alone.[13] A positive correlation was found between our patients' HADS anxiety and depression scores with their SCORAD. The coexistence of anxiety, depression and AD suggests that genetic or environmental risk factors were present. Hypothalamic-pituitary dysregulation is hypothesised to contribute to the association between psychiatric symptoms and the immune responses in AD.[14] Hyporesponsiveness of the axis, induced by chronic stress, leads to lower cortisol secretion. This upregulates the secretion of inflammatory cytokines that are usually counter-regulated by cortisol. In particular, psychiatric comorbidity affects interferon-gamma and interleukin-4 more in patients with AD.[15] Additionally, higher levels of central corticotrophin-releasing factor in patients with depression may reduce the itch threshold, leading to chronicity of AD and psychological burden, perpetuating the itch-scratch cycle.[16]

While broad screening questions such as "Are you depressed?" and "Do you worry a lot?" have an acceptable

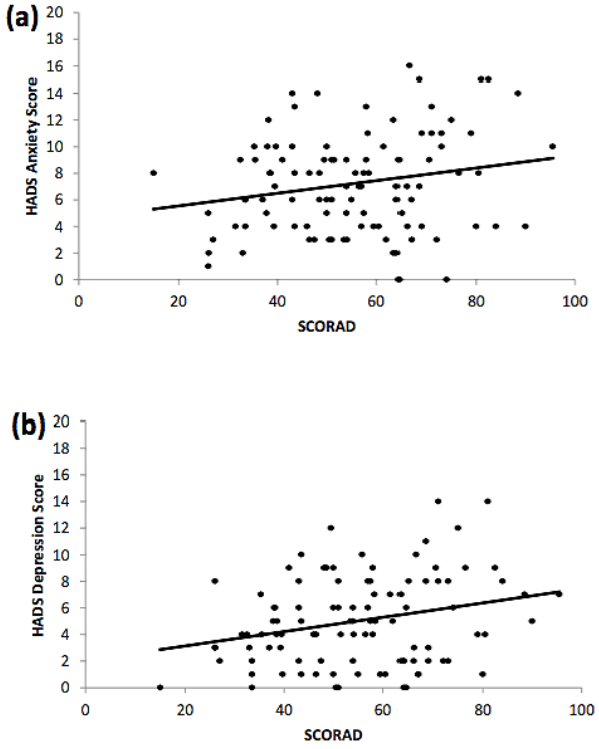

Fig. 1. Linear regression between subjects' SCORAD values with their corresponding a) anxiety and b) depression scores on the HADS. The relationship in both cases was positive but weak (Spearman's rank correlation coefficient, $\rho = 0.18$, $P = 0.08$ for SCORAD vs anxiety and $\rho = 0.21$, $P = 0.03$ for SCORAD vs depression).

sensitivity and specificity in detecting psychiatric comorbidity in AD patients,[17] beyond the routine quality of life (QOL) questionnaire, patients with more severe AD should be further evaluated for the presence of anxiety and depressive symptoms with the HADS. Early psychiatric intervention addressing the psychosocial effects of AD within a multidisciplinary team that involves a dermatologist, psychiatrist and psychologist will improve adherence to treatment and QOL.[18]

An important and critical aspect of holistic management is patient empowerment. A trusting doctor-patient relationship has to be established in order to allow the patient to understand their skin condition and learn how to proactively participate in management.[19] "Eczema schools" have been set up in Germany over the last decade, with comprehensive programmes designed to educate patients on the causes, triggers, allergens, proper use of topical medications and their side effects, adequate coping strategies for stress, and includes patient participation in their choice of medication.[20] Another useful therapeutic intervention is psychotherapy, as Linnet and Jemec have found that AD patients with a higher anxiety level are more likely to improve their psychological and dermatological condition after psychotherapy.[21] Since as many as 18% of our AD patients suffer from anxiety symptoms, psychotherapy interventions such as individual cognitive behaviour therapy and group therapy may improve adherence to AD treatment and overall response to treatment.[22] Such involvement in their own care have improved patients' health-related QOL,[19] alleviating overall psychological burden. Locally, these interventions have yet to be formally structured and delivered, but when done so, are also likely to improve patients' QOL.

Limitations

There are several limitations to the study. As this involves an interviewer-administered questionnaire, we cannot exclude the possibility that response may be influenced by the expectations of the interviewer (Rosenthal effect), although we sought to mitigate this by reminding the administrators to adhere to standardised questions of the HADS. The majority of our study cohort was Chinese, and our experience in the dermatology clinics seems to show fewer affected Indians and Malays. Of course, this parallels the ethnic profile of the general Singapore population with the Chinese being the majority. Males are more affected by AD than females, with the possibility that females may have adhered better to treatment. In clinical practice, less older females may have AD (GYC, personal communication). In addition, almost all enrolled had SCORAD ≥20 (i.e. moderate or severe AD); hence we cannot determine the frequencies of anxiety and depression amongst those with mild disease. Lastly, future studies can focus on mild AD in women, or involve a larger cohort of patients, before and after intervention in management have been developed.

Conclusion

Based on the HADS, there is a significant presence of anxiety and depression in chronic AD patients with moderate to severe disease locally. The HADS is a useful screening tool to detect these conditions and may be considered in routine clinical practice. Following the understanding of the emotional impact on AD, greater emphasis should be placed on building a good doctor-patient relationship, patient education and stress relief as part of holistic management to improve overall patient care.

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