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The impact of skin involvement on the psychological well-being of patients with sarcoidosis

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Abstract. *Background:* Physicians frequently face challenges when screening and managing mental health impairment caused by different diseases, particularly those involving the skin. *Objective:* We aim to identify the major aspects of mental health impairment related to secondary skin involvement occurring in sarcoidosis patients. *Methods*: A total of 718 patients with a biopsy-confirmed diagnosis of sarcoidosis were included from the A Case Control Etiologic Study of Sarcoidosis (ACCESS) study. Sample was divided into two groups depending on presence or absence of skin involvement. Each recruited patient underwent mental health assessment using two measures: depression and mood scales. Demographic data of participants was obtained. *Results:* A total of 143 sarcoidosis patients had secondary skin involvement, and 575 had no skin involvement. Sarcoidosis patients with skin involvement had lost their appetite more frequently, experienced low mood more frequently, and had frequently encountered a significant loss of acceptance compared to patients without skin involvement. *Conclusion:* A multidisciplinary approach including a focused psychological assessment for patients with sarcoidosis; particularly those with skin involvement, is encouraged. *(Sarcoidosis Vasc Diffuse Lung Dis 2019; 36: 59-60)*

Key words: sarcoidosis, chronic disease, depression, psychology, skin

Acronyms and abbreviations:
ACCESS, A Case Control Etiologic Study of Sarcoidosis
CESD, The Center for Epidemiologic Studies Depression Scale

Introduction

Skin lesions are commonly encountered in patients with different chronic systemic diseases. Such involvement can be associated with mental health impairment that is distinct from the psychological stress caused merely by the chronic illness per se. Patients with chronic skin lesions are frequently distressed by symptoms of physical disfigurement, itching, scratching and impaired daily activities (1).

Psychological factors play an important role in at least 30% of skin disorders (2). Several studies have reported high rates of mental health co-morbidities among patients with chronic skin conditions (2, 3). Furthermore, it was reported that patients with chronic skin conditions are more likely to report mental health symptoms and suicidal ideation when compared to those without chronic skin conditions (4). Previous literature has shed light on mental health disorders and symptomatology alongside primary skin conditions (e.g. acne vulgaris, psoriasis, ... etc.). However, no significant data has reported the impact of secondary skin involvement as a part of multi-systemic diseases. The present study addresses

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the psychological impact associated with secondary skin involvement in sarcoidosis.

Sarcoidosis is a multi-systemic disease characterized by the formation of non-caseating granulomas in various tissues. It is estimated that 25-30% of patients with sarcoidosis suffer from skin manifestations related to their illness (4, 5). Skin involvement can occur at any stage of the disease, but most frequently they occur at the onset; so that a dermatologist or a primary healthcare physician may be the first to encounter those patients (4, 6). In contrast, both primary healthcare physicians and dermatologists face challenges in screening as well as diagnosing mental health co-morbidities associated with other long-standing illnesses (7).

The aim of this study is to emphasize the role of dermatologists and primary healthcare physicians in addressing mental health disabilities caused by skin involvement in patients with sarcoidosis. We also aim to focus on the importance of early diagnosis and management of accompanying psychological impairment or any form of mental health disorders related to such skin manifestations occurring in patients with sarcoidosis. We retrospectively assessed a sample of patients with sarcoidosis form the A Case Control Etiologic Study of Sarcoidosis (ACCESS) study sample data for presence of any mental health impairment that can be related to their skin manifestations.

Methods

Our study was approved and informed consent was waived by Jordan University's International Review Board (IRB) committee with an agreement by the National Institute of Health (NIH).

Patient inclusion

This study included participants from A Case Control Etiologic Study of Sarcoidosis (ACCESS). ACCESS is a case-control multicenter study designed to determine the etiology of sarcoidosis, and was conducted in 10 clinical centers in the United States. ACCESS study enrolled 736 patients with recent tissue confirmation of granuloma (within 6 months) and a compatible clinical course. Tissue samples are considered positive for sarcoidosis if they demonstrate non-caseating granuloma and are read as being compatible with a diagnosis of sarcoidosis, without other possible causes such as tuberculosis or histoplasmosis. Only patients 18 years of age or older were included in the study. All patients having active tuberculosis or taking anti-tuberculosis therapy were excluded. Organ involvement was determined in each patient, using an assessment system based on findings from history, physical examination, and laboratory testing. Skin involvement was confirmed clinically as well as pathologically by the finding of non-caseating granulomas in biopsies obtained from these lesions. Further details on the study can be found in previous studies (8, 9).

In the present study, 718 participants from the ACCESS population were included. Those were participants who have a biopsy-confirmed diagnosis of sarcoidosis according to the criteria of ACCESS study. We divided our sample population into two groups: the first included 143 patients who have biopsy-confirmed skin involvement, and the second group included 575 sarcoidosis patients without skin involvement as controls. Demographic data including patient's age, gender, and marital status of each participant were obtained. The responses of recruited patients to both the depression questionnaire and mood questionnaire (Check appendix 1 and 2) were also obtained. These questionnaires are designated by the ACCESS study to determine the psychosocial- and health-related quality of life features associated with sarcoidosis. The mood questionnaire is the same as Life Orientation Test (LOT), which assesses patient's mood via a 12-item questionnaire, where each patient can choose a score from one to five based on the intensity of the mood change under question (Appendix 1) (10).

The depression questionnaire covered patients' complaints over the past week. It is a short form of the original CESD questionnaire and included 11 items derived from the 'Center for Epidemiologic Studies Depression Scale' (CESD) (11). The Center for Epidemiologic Studies Depression Scale (CESD) was created in 1977 by Laurie Radloff, and revised in 2004 by William Eaton and other (11). The CESD is a screening test for depression and depressive disorder. It measures symptoms defined by the American Psychiatric Association' Diagnostic and Statistical Manual (DSM-V) for a major depressive episode questions. Respondents are asked to choose a score

from zero to four based on the duration of the complaint during the previous week (Appendix 2).

Statistical analysis

In our statistical analysis, we used IBM SPSS for Windows release 21.0 (SPSS Inc., Chicago, IL); and implemented descriptive statistics to define our sample population. We used Independent Sample T-test to study sarcoidosis patients with skin lesions versus those without; according to variables being: age, depression scores, and mood scores. Furthermore, we used Pearson correlation to study the relation between age and depression and mood scores. We considered P value of less than 0.05 as statistically significant.

Results

A total of 718 patients diagnosed with sarcoidosis were included in this study, there were 261 (36.4%) males and 457 (63.4%) females with an age range from 18 to above 60 years of age. Our sarcoidosis patients comprised of: 143 (20%) with skin involvement (42 males, 101 females), and 575 (80%) without skin involvement (219 males, 356 females).

Upon analysis of depression questionnaire, statistically-significant correlation with skin involvement was only found with questions number two, five and eleven (appendix 2), with a seemingly direct trend. Sarcoidosis patients with skin involvement had lost their appetite (p=0.001), and had experienced the feeling of low mood (p=0.03) more frequently as opposed to those without skin involvement. Patients with skin involvement also showed a more statistically significant loss of acceptance (p=0.012). We didn't find a significant difference in the total depression score with skin involvement. Detailed percentages and p values for each question are shown in (Table 1).

Regarding the mood questionnaire (appendix 1), none of the included questions, nor the total score, showed any statistically significant correlation with skin involvement (p value >0.5). Detailed percentages and p values for each question are shown in (Table 2).

On studying the relevance between demographic data (age, gender and marital status as individual factors) and skin involvement; we found out that none of them had any statistically significant correlation with skin involvement per se. However, gender discrepancy significantly affected the type of skin lesions (p=0.01), where erythema nodosum was found to affect 44 female patients compared to 12 male patients; with a male to female ratio of approximately 1:4. Moreover, gender discrepancy was also significantly associated with several depression questions of patients in both groups; including question number two (p<0.001); which assesses loss of appetite; and question number five (p<0.001), which assesses frequency of experiencing low mood. Both questions showed a statistically significant higher frequency in females.

Discussion

Previous literature did not shed enough light on psychological aspects in patients with chronic systemic diseases such as sarcoidosis, yet several studies have managed to point out the effectiveness of addressing psychological management in such group of patients (12). It is worth noting that an estimated 25% of patients with dermatological manifestations have significant psychological morbidity (13). Literature addressing psychological aspects affecting patients with skin manifestations in chronic systemic diseases, particularly sarcoidosis, is quite scarce. In our study, we aimed to fulfill this gap, and address such a vital, yet overlooked subject.

Our study, showed that sarcoidosis patients with skin involvement had a statistically significant greater frequency of decreased appetite when compared to those without skin manifestations. This complaint was noticeably more frequent among female patients. Such a significant finding was not documented in previous literature. On the contrary, in a similar study that was conducted on children; the aforementioned relationship was not of note (7). Other studies examining stand-alone skin lesions and manifestations, have not shown any relationship to appetite (14).

It was also reported that once decreased appetite leads to weight loss in patients with chronic diseases; the general health, wellbeing and functionality are dramatically affected (15). Thus, decreased appetite is a serious co-morbidity that should not be overlooked by clinicians, and primary healthcare physicians in particular, as they are the first line of contact in most

Table 1. The following table shows the percentages of each response to the depression questionnaire (appendix 1) for sarcoidosis patients with skin involvement (Yes) and without skin involvement (No). The results of statistically comparing both groups are presented and the significant *p* values are shown in bold

Question	Skin involveed	Rarely (Less than 1 day)	Some of the time (1-2 days)	Moderate amount of the time (3-4 days)	Most of the time (almost every day)	Total % (#)	*p*-Value
1- I was bothered by things that don't usually bother me	Yes	49.7%	30.1%	11.9%	8.4%	100% (143)	0.28
	No	60.3%	24.2%	9.7%	5.7%	100% (575)	
2- I did not feel like eating, my appetite was poor	Yes	62.2%	19.6%	8.4%	9.8%	100% (143)	**0.001**
	No	68.9%	18.3%	9%	3.8%	100% (575)	
3- I had trouble keeping my mind on what I was doing	Yes	42%	33.6%	14.7%	9.8%	100% (143)	0.79
	No	53.2%	27.8%	10.6%	8.3%	100% (575)	
4- I felt everything I did was an effort	Yes	32.9%	32.2%	15.4%	19.6%	100% (143)	0.28
	No	45.9%	26.1%	14.4%	13.6%	100% (575)	
5- I felt low mood	Yes	45.5%	31.5%	7.7%	15.4%	100% (143)	**0.03**
	No	55.3%	28.5%	10.3%	5.9%	100% (575)	
6- I felt hopeful about the future	Yes	12.6%	21.7%	24.5%	41.3%	100% (143)	0.55
	No	15%	20.2%	24.9%	40%	100% (575)	
7- I felt fearful	Yes	61.5%	25.2%	7%	6.3%	100% (143)	0.21
	No	65.9%	23%	6.4%	4.7%	100% (575)	
8- My sleep was restless	Yes	28.7%	23.8%	23.8%	23.8%	100% (143)	0.20
	No	29.7%	30.6%	19.5%	20.2%	100% (575)	
9- I was happy	Yes	11.9%	19.6%	25.9%	42.7%	100% (143)	0.13
	No	6.8%	22.3%	29.2%	41.7%	100% (575)	
10- I felt lonely	Yes	60.1%	22.4%	11.2%	6.3%	100% (143)	0.11
	No	64.3%	22.6%	8%	5%	100% (575)	
11- I could not get going	Yes	41.3%	28%	14.7%	16.1%	100% (143)	**0.01**
	No	43.5%	34.4%	12.9%	9.2%	100% (575)	

cases. Nonetheless, when patients with sarcoidosis were asked to give some feedback on the Sarcoidosis Health Questionnaire SHQ, the general consensus showed dissatisfaction; and the main reason was that the questionnaire did not address the subject of appetite (16), which is consistent with our finding.

Our study showed that the frequency of experiencing low mood is higher amongst sarcoidosis patients with skin involvement. A similar finding was documented in a previous study in 2006, that was conducted on skin manifestations of chronic skin conditions in children (7). An earlier study also showed that both low mood and psychological distress are two major factors that reflect the general wellbeing, and can be used as parameters to assess psychological comorbidities related to skin conditions (1). Furthermore, lack of acceptance, i.e. refusal to accept and adapt with current circumstances, is another major finding in our study. It was evidently and significantly experienced in sarcoidosis patients with skin involvement. Other studies of similar nature showed similar findings; where psoriasis patients were found to experience lack of acceptance which was influenced by age, gender and disease duration; thus having a more complex relationship (17). Disease acceptance and adaptation to living circumstances was found to improve patients' distress (18). It was also noted to have a beneficial effect on both general and mental health status of patients diagnosed with chronic systemic diseases such as rheumatoid arthritis and multiple sclerosis (18). Accordingly, we suggest that delivering news of diagnosis or

Table 2. The following table shows the percentages of each response to the mood questionnaire (appendix 2) for sarcoidosis patients with skin involvement (Yes) and without skin involvement (No). The results of statistically comparing both groups are presented and the significant *p* values are shown in bold

	Skin involved	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total % (#)	p-Value
1- In certain times, I usually expect the best	Yes	22.1%	33.7%	25.6%	18.6%	0%	100% (86)	0.966
	No	20.4%	35.6%	26.6%	17.4%	0%	100% (632)	
2- It is easy for me to relax	Yes	7%	38.4%	18.6%	32.6%	3.5%	100% (86)	0.158
	No	11.9%	31%	26.4%	25.5%	5.2%	100% (632)	
3- If something can go wrong for me, it will	Yes	7%	19.8%	31.4%	33.7%	8.1%	100% (86)	0.541
	No	6.8%	17.1%	25.2%	38.4%	12.5%	100% (632)	
4- I always look on the bright side of things	Yes	17.4%	43%	25.6%	14%	0%	100% (86)	0.545
	No	24.2%	37.5%	24.4%	13.9%	0%	100% (632)	
5- I am always optimistic about my future	Yes	18.6%	34.9%	31.4%	15.1%	0%	100% (86)	0.188
	No	24.1%	40.2%	21.5%	14.2%	0%	100% (632)	
6- I enjoy my friends a lot	Yes	31.4%	50%	14%	4.7%	0%	100% (86)	0.470
	No	37.5%	41.9%	16.9%	3.6%	0%	100% (632)	
7- It's important for me to keep busy	Yes	30.2%	37.2%	18.6%	14%	0%	100% (86)	0.167
	No	38.3%	39.1%	14.4%	8.2%	0%	100% (632)	
8- I hardly ever expect things to go my way	Yes	3.5%	24.4%	15.1%	40.7%	16.3%	100% (86)	0.07
	No	4.9%	12.2%	19.8%	44%	19.1%	100% (632)	
9- Things never work out the way I want them to	Yes	2.3%	7%	26.7%	48.8%	15.1%	100% (86)	0.09
	No	3.6%	10.1%	17.1%	44.6%	24.5%	100% (632)	
10- I don't get upset too easily	Yes	10.5%	36%	19.8%	22.1%	11.6%	100% (86)	0.571
	No	12.8%	38.3%	21.8%	20.1%	7%	100% (632)	
11- I am a believer in the idea that "every cloud has a silver lining"	Yes	17.4%	39.5%	30.2%	12.8%	0%	100% (86)	0.566
	No	22.6%	41.3%	24.7%	11.4%	0%	100% (632)	
12- I rarely count on good things happening to me	Yes	5.8%	10.5%	22.1%	40.7%	20.9%	100% (86)	0.415
	No	4.3%	12.7%	15.6%	43.3%	24.2%	100% (632)	

complications related to sarcoidosis, as a chronic systemic disease, to patients should be dealt with more sensitively and cautiously. As the lack of acceptance and denial of diagnosis amongst patients, could have ripples that might be of major contribution in lowering adherence rates in medical or drug therapies. Eventually, causing delays in clinical improvement of the disease as a whole.

Gender difference should also be considered. At present, our study showed that females were more frequently experiencing a decrease in their appetite and low mood. On contrary, other studies reported that age and gender are not significantly related to psychological status of patients with chronic skin diseases such as atopic dermatitis and psoriasis (1).

We suggest that healthcare professionals revisit the general assessment tools in patients with sarcoidosis. We thus advice, our fellow colleagues and physicians to pay extra attention to mental health and psychological well-being of their patients and to keep in mind the relevant risk factors discussed earlier, for "without mental health there can be no true physical health" as Dr Brock Chisholm, the first Director-General of the World Health Organization (WHO) stated many years ago.

Worth mentioning, our study had limitations that need to be taken into account. First, our study might have a mild form of selection bias as it only included patients with sarcoidosis. Whether our findings can be generalized to other chronic systemic

diseases with skin involvement is still uncertain. Second, the cofounding effect of other variables, such as employment, socioeconomic status, and existence of other psychological comorbidities, could not be ruled out as their effects were not included in the questionnaires. Third, we could not definitely rule out if some of our control group had a clinically-silent skin involvement that was not proven by biopsy at time of diagnosis, which might under-estimate our findings. Forth, we could not classify the skin involvement in our patients into acute or chronic, so we were not able to study the difference in disease impact on mental health and well-being between acute and chronic skin involvement. Finally, depression and mood questionnaires used do not ask specifically about skin, and as Sarcoidosis is a multi-system disease, the involvement of other system may have a confounding effect on our results. We encourage future research to be carried out in the same area to study a broader sample of patients with different chronic multi-systemic diseases with skin manifestations and to assess their general mental health and well-being.

In summary, skin involvement in sarcoidosis is a major player in the affected patients' psychological wellbeing. Sarcoidosis patients with skin manifestations have lost their appetite more frequently, were more prone to grief and more frequently experienced loss of acceptance compared to those without skin involvement. Our study results encourage dermatologists and primary health care physicians to carefully address skin manifestations, especially when they are part of a bigger picture of chronic multi-systemic diseases; being sarcoidosis in our study.

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Supplementary material

Appendix 1

Mood assessment questionnaire

The following questions ask about your mood and attitudes:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1- In certain times, I usually expect the best.					
2- It is easy for me to relax.					
3- If something can go wrong for me, it will.					
4- I always look on the bright side of things.					
5- I am always optimistic about my future.					
6- I enjoy my friends a lot.					
7- It's important for me to keep busy.					
8- I hardly ever expect things to go my way.					
9- Things never work out the way I want them to.					
10- I don't get upset too easily.					
11- I am a believer in the idea that "every cloud has a silver lining".					
12- I rarely count on good things happening to me.					

Appendix 2

Depression assessment questionnaire

The following questions ask about your feelings during the past week. For each of the statements, please indicate if you felt that way rarely or never, some of the time, a moderate amount of time, or most of the time.

	Rarely (Less than 1 day)	Some of the time (1-2 days)	Moderate amount of the time (3-4 days)	Most of the time (almost every day)
1- I was bothered by things that don't usually bother me.				
2- I did not feel like eating, my appetite was poor.				
3- I had trouble keeping my mind on what I was doing.				
4- I felt everything I did was an effort				
5- I felt low mood.				
6- I felt hopeful about the future.				
7- I felt fearful.				
8- My sleep was restless.				
9- I was happy.				
10- I felt lonely.				
11- I could not get going.				