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ORIGINAL ARTICLE

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Implications of Psychosocial Factors as Precipitant of Asthma Attack Among a Sample of Asthmatics

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Objective. To explore the relationship between psychosocial factors and asthma. *Methods.* One hundred consecutive asthmatics were screened using the 30-item version of the General Health Questionnaire (GHQ-30), Present state examination (PSE) and a socio- demographic schedule incorporating psychosocial variables. Chi-squared test, student "t" test and discriminant analysis were used in analysis. *Results.* Among the asthmatics studied 36% had psychopathology. Psychosocial variables significantly associated with psychopathology include worrying, crying, fighting, anger, marital tension, and menstruation. The presence of multiple psychosocial variables was significantly associated with psychopathology. *Conclusion.* Psychosocial variables predict the presence of psychopathology.

Keywords sociodemographic, psychosocial factors, asthma, discriminant, emotion

INTRODUCTION

There is an increasing body of evidence that psychological and psychosocial factors are important as precipitants of asthma attacks (1). Bronchial asthma may be triggered by various factors such as infection, allergies, and emotional factors. It is, however, recognized that one of these factors is predominant, while others are secondary in subsequent attacks (2).

Emotional states such as anxiety, depression, guilt, anger, frustration, excitement, and joy, have all been known to precipitate asthma attacks in predisposed individuals (3, 4). Clinical and laboratory research has shown that asthmatics have greater bronchoconstriction compared to healthy controls in response to stress, and in everyday life (5–7). Miklich et al. (8) found drops in peak expiratory flow rate during various emotional states. This association was with the emotional state, and not merely with the concomitant vocal/respiratory behaviors associated with them, such as shouting. Levitan (9) also described 6 cases, whose disease first appeared during periods of mourning. In another study, Hyland (10) found a positive correlation between mood ratings and evening, not morning, peak flow ratings in 6 of 10 asthmatics, and noted that subjects who showed this relationship also manifested large changes between morning and evening peak flow readings. This suggests that asthma exacerbations were caused by changes in mood, which in turn were produced by various stresses encountered during the day. Isenberg et al. (11) in a review also suggested that a passive response to stress or embarrassing situations appears to trigger clinically significant bronchoconstriction in 20% to 40% of asthmatic patients.

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Other psychosocial factors considered important in bronchial asthma include crying, fears of separation or loss, menstruation, and sexual problems among others (12)]. However, establishing that a temporal correlation exists between asthma and the experience of negative emotion does not necessarily imply causal relationship between the two since asthma may precipitate emotions or may result from them.

As shown in previous studies, both in the Nigerian environment (13, 14) and among Caucasians (15–17), asthmatics tend to have a higher occurrence of psychopathology compared to patients with other chronic conditions. This has been attributed to high levels of anxiety and depression (17). In this environment, house dust, mites, and viral infection have been reported as common precipitants (18, 19) of asthma attacks. However, psychosocial and emotional factors as precipitants of asthma have not been previously examined in this environment.

The aim of this study is to create awareness that those patients whose asthma attacks are precipitated by psychosocial or emotional factors have a higher risk of developing psychopathology or may have comorbid psychopathology.

METHODS

This study was conducted at the Ile-Ife State Hospital (ISH) unit of the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC). Ile-Ife is a Yoruba town located in South-Western Nigeria, some 220 km away from the former capital city of Lagos. The hospital is a referral center for most hospitals in about 6 to 7 states around Ile-Ife.

Subjects

Adult patients suspected of having asthma were referred to the Chest Clinic. On average, 55 to 60 patients are treated weekly; of these 5 to 10 are new referrals. The consultant

chest physician diagnosed each patient using the following criteria:

1. History of cough with or without mucus production, wheezing with intermittent remission, dyspnea, and chest tightness.

Physiological measurements performed included:

2. peak expiratory flow (PEF) and forced expiratory volume in one second (FEV_1) value of 80% below predicted normal;
3. reversibility test with bronchodilator or steroid shown by at least 20% and above improvement within 20 minutes of inhalation of aerosol (20, 21).

One hundred adult patients age18 to 65 years of age, both newly and previously diagnosed, provided informed consent to participate in the study. The patients' accounts of precipitants of their asthma attacks were corroborated by other informants, usually a close relation, and information on precipitating factors was also obtained from their case notes. If discrepancies could not be resolved, such psychosocial factors were excluded from the list for such patient. Ethical clearance for the study was obtained from the Institution's ethical committee.

Procedure

A sociodemographic questionnaire was used to elicit variables such as age, sex, marital status, religion, and educational and occupation status. Included in this sociodemographic questionnaire are psychosocial variables extracted from the Life-Events Schedule published by Paykel (22). A list of 13 variables were extracted and incorporated.

Each patient also completed the 30-item version of the General Health Questionnaire (GHQ) devised by Goldberg ( ) to elicit psychopathology. This is a self-rating instrument that measures distress, establishes frequency of psychiatric illness in a population, and identifies individuals with mental problems as well as reduced well-being. The Yoruba version was completed by subjects who could read the language. However, it was read by one of the investigators to those who could not read but understood only this language. Assistance and clarification were given whenever necessary. This version of the questionnaire (GHQ 30) had been widely used in this environment, and a cut-off point of 5 and above was identified as indicating possible psychopathology in this environment (2 . Using the Present State Examination (PSE) (25) and without the knowledge of the GHQ score, one of the investigators interviewed all patients to ascertain psychopathology and made specific psychiatric diagnosis. Syndromes were derived from symptoms elicited as present by using the Syndrome Check List (SCL) contained in the PSE manual. In addition to this, an Axis 1 diagnosis was made in each case if it fulfilled any of the diagnostic criteria for the International Classification of Diseases, 10th edition (ICD-10). The PSE had been used widely in this environment (26, 27) and one of the first investigators was trained in its use.

Statistical Analysis

The patients were divided into two groups: (1) asthmatics having psychopathology (GHQ > 5) and PSE diagnosis in one group, and (2) asthmatics not having psychopathology in the second group (GHQ < 5). The data obtained were compared using Chi – squared test (χ^2) and Student's t test. Discriminant analysis was also performed, and Kappa analysis was used to assess prediction accuracy.

RESULTS

The age range of all asthmatics was between 18 to 65 years of age with a mean age of 40.65 (SD = ±14.4). The mean duration of asthma symptoms for all asthmatics was 11.4 years of age. Between the two groups, there were no significant differences in the sociodemographic variables measured, with the exception of the religious leanings in the groups ($\chi^2 = 5.75$, $df = 1$, $p = 0.03$). Mean asthma duration was also not significantly different (Table 1).

The GHQ identified 39 (39%) patients as possible psychiatric cases (GHQ score > 5); however, the interview done using the PSE classified 36 (36%) as having some form of psychopathology. Since the PSE is a diagnostic instrument while the GHQ is only a screening instrument for measuring distress, the 36 patients identified by the PSE were classified as having psychopathology. A comparison of the GHQ 30 mean scores of the two groups using the t test showed a significant difference between the asthmatics with psychopathology and asthmatics without psychopathology ($t = 13.84$, $df = 98$, $p = 0.0001$). Psychopathology distribution showed that 23% had generalized anxiety disorder, 11% had depressive disorder, and 2% had panic disorder.

A comparison of the psychosocial risk factors studied (Table 2) indicated that 4 of the 13 factors considered were significantly associated with psychopathology among asthmatics. These were worrying and crying ($\chi^2 = 11.67$, $df = 1$, $p = 0.001$), fighting and anger ($\chi^2 = 17.49$, $df = 1$, $p = 0.0001$), marital tension ($\chi^2 = 8.1$, $df = 1$, $p = 0.009$), and menstruation ($\chi^2 = 11.35$, $df = 1$, $p = 0.002$). Major financial problems as well as the other 8 factors were not significantly associated with psychopathology among asthmatics.

A comparison of the number of precipitants present in each group was also done. The result showed that 75% (27) of all asthmatics with psychopathology had at least one psychosocial factor as a precipitant of their asthma attack, while only 25% (16) among asthmatics without psychopathology had at least a psychosocial factor as a precipitant of their attacks (Figure 1).

The discriminant analysis conducted showed that the psychosocial factors that were significantly associated with asthma have predictive value. The overall Wilks Lambda was significant ($\lambda = 0.67 \chi^2 = 37.25$, $df = 10$ ($n = 100$) $p = 0.0001$) indicating that the factors differentiated the two groups. The discriminant function has an eigenvalue of 0.5 and a canonical correlation of 0.58. The Kappa value was also calculated to correct for chance agreement. A Kappa value of 0.45 ($p = 0.0001$) was obtained, which indicated a moderately accurate prediction.

DISCUSSION

The sociodemographic characteristics of asthmatics with psychopathology, and those without psychopathology did not show any significant differences. Some studies have reported a correlation between the occurrence of psychopathology and the patient's sex and age, with the older age group and females

TABLE 1.—Sociodemographic distribution of patients with asthma with psychopathology and without psychopathology.

Parameters	Asthmatics with Psychopathology $n = 36$	Asthmatics without Psychopathology $n = 64$	Test of Statistical Significance
Mean	40.7	40.0	
SD	13.6	14.8	
Range	18–65	18–65	
Sex			
Female	24(66.1%)	36(56.3%)	$\chi^2 = 1.04$
Male	12(33.3%)	28(43.8%)	DF = 1
Total	36	64	P = 0.39
Religion			
Christian	29(80.6%)	61(95.3%)	$\chi^2 = 5.78$
Moslem	7(19.4%)	3(4.7%)	DF = 1
Traditional	0(0%)	0(0%)	P = 0.03
Educational status			
Non (N)	6(16.7%)	8(12.5%)	$\chi^2 = 2.79$
Primary (P)	4(11.1%)	10(15.6%)	DF = 3
Secondary (S)	16(41.0%)	20(31.3%)	P = 0.43
Tertiary (T)	10(27.8%)	26(40.6%)	
Marital status			
Married	22(61.1%)	40(62.7%)	$\chi^2 = 3.79$
Single	10(27.8%)	21(32.8%)	DF = 3
Divorced/separated	2(5.6%)	0	P = 0.29
Widow/widower	2(5.6%)	3(4.7%)	
Occupational status			
(A) Major group 0–1 (Professionals, managers, administrators)	6(16.7%)	21(32.8%)	$\chi^2 = 4.42$
(B) Group 2–4 (Clerical officer salesmen)	2(5.6%)	4(6.3%)	$df = 4$
(C) Groups 5–8 (farmers, artisans)	19(47.1%)	20(31.3%)	p = 0.35
(D) Group 9–X (unskilled and unidentified)	5(13.9%)	6(9.4%)	
(E) Students	6(15.7%)	13(20.3%)	
Duration of asthmatic symptoms			
Mean (yrs)	11.7	11.0	
SD	7.25	9.5	
Range	2–30	1–45	

reportedly having a higher occurrence of psychopathology (15). The religious affiliation of the patients was statistically significant: 10(10%) of the patients were Moslem and 7(70%) of these had psychopathology. Ile–Ife, where this study was conducted, is in the southwestern geopolitical zone of Nigeria, with roughly equal population of Moslems and Christians. The low proportion (10%) of Moslems in the sample appears to be an under-representation of adherents of Islam in the general population and may have to do with the illness behavior of Moslems with respect to asthma in this part of the world. The finding that 70% of these Moslems had psychopathology associated with their asthma is also very important. One explanation may be because all 7 were females, with an average duration of asthma symptoms of

TABLE 2.—Psychosocial risk factors distribution.

Variables		Asthmatics with psychopathology	Asthmatics without psychopathology	χ^2 Test
Worrying/crying	A	19(52.8%)	54(84.4%)	$\chi^2 = 11.67$
	P	17(47.2%)	10(15.6%)	$df = 1$
				$p = 0.001$
Fighting and anger	A	16(44.4%)	54(84.4%)	$\chi^2 = 17.49$
	P	20(55.6%)	10(15.6%)	$df = 1$
				$p = 0.0001$
Marital tension	A	30(83.3%)	63(98.4%)	$\chi^2 = 8.1$
	P	6(16.7%)	1(1.6%)	$df = 1$
				$p = 0.008$
Major financial problem	A	31(86.1%)	62(96.9%)	$\chi^2 = 4.10$
	P	5(11.9%)	2(3.1%)	$df = 1$
				$p = 0.09$
Boyfriend/girlfriend difficulty	A	34(94.4%)	64(98.4%)	$\chi^2 = 1.26$
	P	2(5.4%)	1(1.6%)	$df = 1$
				$p = 0.3$
Menstruation	A	30(83.3%)	64(100%)	$\chi^2 = 11.35$
	P	6(16.7%)	0(0%)	$df = 1$
				$p = 0.002$

A = absent; P = present.

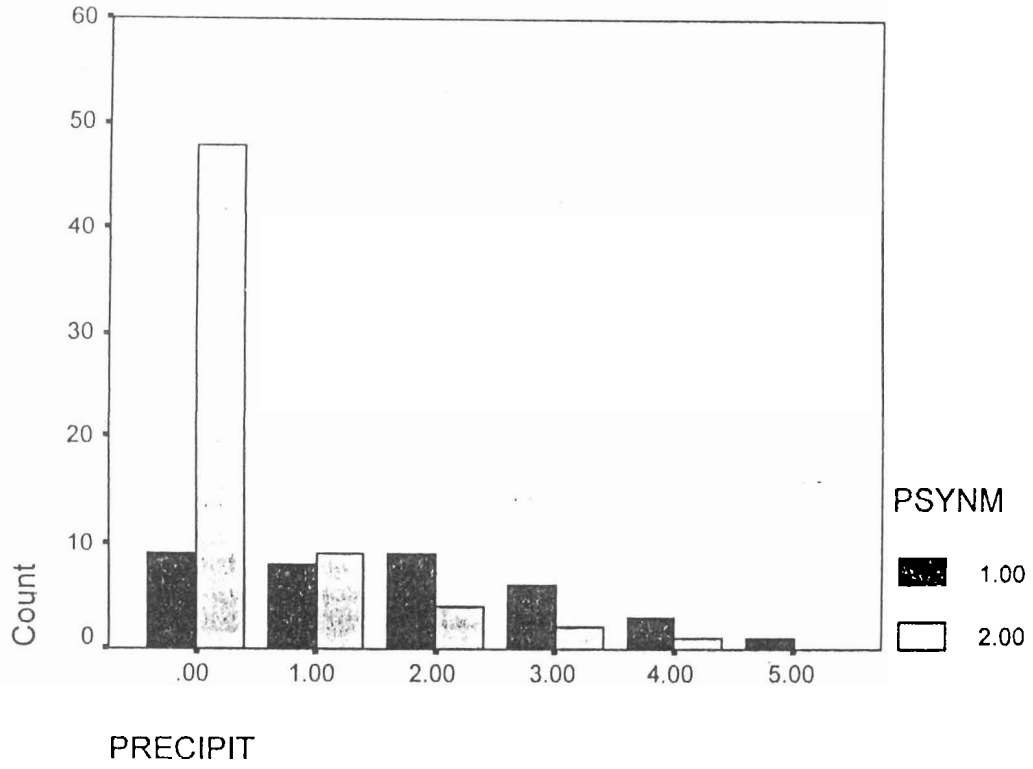

FIGURE 1.—Comparison of the number of psychosocial precipitants of asthma between asthmatics with psychopathology and asthmatics without psychopathology. Count = number of asthmatics; PRECIPIT = number of psychosocial precipitants present; 1 = asthmatics with psychopathology; 2 = asthmatics without psychopathology.

15 years, which is slightly higher than that of all patients with psychopathology (11 years). However, these will need further study for clarification.

Many factors have been considered responsible for the increasing asthma related mortality. Yellowlees et al. (28) described high levels of psychiatric disorders including anxiety among individuals having a near fatal attack of asthma. In another review (1), it was concluded that among other factors psychosocial problems and psychiatric disturbances are important, and their presence increases the risk of death among asthmatics. Yellowlees et al. (29) suggested a possible interaction between medical and psychosocial issues in patients with asthma, which might explain many differences in levels of morbidity and mortality. They proposed further research to examine a possible association between psychiatric disorders, psychosocial vulnerability, and risk of death in asthma. Rea et al. (30) in their study also showed that both noncompliance and the presence of overt psychosocial problems were risk factors for death from asthma.

Several studies have found evidence for more negative emotion or psychopathology among asthmatics than among normal subjects (31, 32). In a review, Lehrer et al. (33) indicated that it was possible that greater negative emotionality may either exacerbate asthma or result from asthma itself. There is also evidence that at least in some asthmatics, the asthma symptoms are linked to the occurrence of non-asthma stressors (34). Weinstein (35) showed that 40% of 268 mothers of asthmatic children reported an increase in their children's wheezing when they were crying. Graham et al. (36) reported that 35% of parents of asthmatic children noted that some of their children's attacks were brought on by emotion.

This study has shown that a significant association exists between the presence of certain psychosocial factors as precipitants of asthma attacks and the occurrence of psychopathology. Such factors as worrying, crying, fighting, anger, marital tension, and menstruation are significantly associated with psychopathology among asthmatics. Although the other factors did not show a significant association, the presence of a combination of these factors as precipitants of asthma attacks resulted in a higher occurrence of psychopathology. Overall, the findings in this study agree with that of Goreczny et al. (37), who reported that asthmatic symptoms were related to the number and perceived impact of daily stressful events.

The discriminant analysis also showed that psychosocial factors significantly predicted the occurrence of psychopathology among asthmatics with the Kappa analysis indicating moderately accurate prediction.

One significant finding is the denial of sexual problems (12) as a possible precipitant of asthma attack. This may be due to the general shyness associated with discussing sexual matters and sexual disorders in this society. Anecdotal evidence suggests that such matters are only discussed with very close relations who may be able to offer counseling or help. Also, most of the patients seen in this hospital are generally low- income earners whose financial base is relatively low (38), and with the strong extended family network, financial failures are usually cushioned by this network such that this may not constitute a serious source of stress for a single individual.

This study therefore agrees with previous studies in Western societies identifying psychosocial factors as important in

the higher occurrence of psychopathology among asthmatics. For a better result and improved quality of life, asthmatics with negative emotional factors as precipitants of attacks should be screened for possible presence of psychopathology and appropriate intervention strategies should be instituted.

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