Published in final edited form as:

J Psychosom Res. 2002 December ; 53(6): 1049–1052.

The predictive value of the Toronto Alexithymia Scale among patients with asthma

Jonathan M. Feldman^a, Paul M. Lehrer^{b,*}, and Stuart M. Hochron^c

^aDepartment of Psychology, Rutgers — The State University of New Jersey, New Brunswick, USA

^bDepartment of Psychiatry, UMDNJ—Robert Wood Johnson Medical School, 671 Hoes Lane, Piscataway, NJ 08854-5635, USA

^cDepartment of Pulmonary and Critical Care Medicine, UMDNJ—Robert Wood Johnson Medical School, Piscataway, NJ, USA

Abstract

Objective—The present study examines how alexithymia, self-report of symptoms, and pulmonary function are related to each other among a sample of patients with asthma. The goal was to extend previous research showing that alexithymia may complicate treatment of asthma.

Methods—Seventy-four participants with asthma completed the Toronto Alexithymia Scale (TAS), Asthma Symptom Checklist (ASC), Taylor Manifest Anxiety Scale (TMAS), and spirometry testing.

Results—The “Difficulty identifying feelings” subscale (IDE) of the TAS was associated with increased report of emotional symptoms (panic–fear) as well as physical symptoms (fatigue) during the past week, but not pulmonary function on the day of testing. This relationship appeared to be influenced by trait anxiety. The “Difficulty communicating feelings” subscale (COM) was correlated with decreased pulmonary function, but not report of emotional or physical sensations experienced during the prior week. The “Externally oriented thinking” subscale (EOT) was not related to any of the dependent measures.

Conclusion—These data suggest that alexithymia may complicate optimal management of asthma and this relationship is best studied by examining the subscales of the TAS separately.

Keywords

Alexithymia; Asthma

Introduction

The term alexithymia was first introduced by Sifneos [1] to describe the absence of emotions and fantasies exhibited by patients with classical psychosomatic diseases, such as asthma, peptic ulcer, ulcerative colitis, and rheumatoid arthritis. It was originally hypothesized that alexithymia was a risk factor for the development of these diseases, but there has been little evidence indicating that alexithymia leads to the development of organic disease [2].

Patients with asthma classified as alexithymic using the MMPI Alexithymia Scale [3] have been shown to be at risk for longer lengths of hospital stay and rehospitalization for asthma [4,5], but they tend to report less physical and emotional symptoms experienced during asthma

attacks [6]. These findings were independent of objective measures of pulmonary function. Therefore, alexithymia may be a risk factor for suboptimal management of asthma due to diminished communication about symptoms of the disease. Unfortunately, the MMPI Alexithymia Scale suffers from reliability and validity problems [7], thereby limiting interpretation of these previous findings on alexithymia and asthma.

Currently, the most widely used scale for assessing alexithymia is the Toronto Alexithymia Scale (TAS) [8] and it consists of three subscales: (1) difficulty identifying feelings (IDE), (2) difficulty communicating feelings (COM), and (3) externally oriented thinking (EOT). The IDE and the COM subscales have been consistently linked to greater report of negative affect and physical symptoms, and these effects appear to be stronger for the IDE subscale [9–13]. However, there has been considerable debate as to whether these subscales are measuring distinct traits of alexithymia or simply tapping a general construct of psychological distress [14]. A recent factor analysis showed that the IDE subscale loads on the construct of anxiety, whereas depression may be more independent from alexithymia [12].

The goals of the present study were to examine the relationships between alexithymia and both self-report of asthma symptoms and objective measurement of pulmonary function. The subscales of the TAS were analyzed separately to examine the utility of alexithymia as a unitary construct. In addition, trait anxiety was also measured to determine whether the TAS subscales would predict symptom report and pulmonary function independent of anxiety. Based on the consistent associations found between the IDE subscale and report of somatic as well as emotional symptoms [9–13], it was hypothesized that this subscale would be associated with self-report of asthma symptomatology. Based on prior research examining the relationship between the MMPI Alexithymia Scale and asthma [5], it was predicted that none of the TAS subscales would be related to pulmonary function.

Although this study includes a reanalysis of data that have been previously reported on an overlapping sample of adults with asthma [15], we have not previously reported analyses on the TAS. Data were collected from 1993 to 1995.

Methods

Participants

Seventy-four adult outpatients with asthma (42 females and 32 males), aged 18–40 years ($M = 25.9$), participated in the study. Subjects were recruited via radio and newspaper advertisements, posted announcements, and notices to physicians. A board-certified pulmonary physician (S.H.) selected patients according to the following criteria: (1) a history of recurrent asthma (wheeze which responds to albuterol) within the prior 12 months and (2) below normal spirometry values ($FEV_1 < 80\%$ expected or $FEF_{50\%} < 60\%$ expected)¹ with no indication of restrictive lung disease (assessed by history and a diffusion capacity test). It should be noted that these specific criteria differ from those recommended in the most recent *Guidelines for the Diagnosis and Management of Asthma* [16], which appeared after the current data were collected. Thus, it is possible that some patients may not have met formal criteria for asthma according to current standards. Exclusion criteria consisted of smoking during the past 2 years, chronic respiratory diseases other than asthma, cardiovascular, neurological, and psychiatric disease requiring psychoactive medication.

---

¹ FEV_1 is the volume of air expired during the first second of a forced vital capacity (FVC) maneuver, which refers to the total volume of air that can be exhaled with maximal effort during the spirometry test. FEV_1 tends to be reduced during asthma exacerbation. $FEF_{50\%}$ is the flow that occurs at 50% of FVC. This measurement consists of flow from the smaller/lower airways and it also tends to be reduced during asthma flares. The FEV_1/FVC ratio is an indicator of obstructive impairment because FVC may be normal in asthma. The maximum flow attained during the FVC maneuver is referred to as the peak expiratory flow (PEF).

Measures

Pulmonary function was assessed by a pneumotachometer-based spirometer (PneuMedics Mega 4000, Milford, CT) using procedures authorized by the American Thoracic Society [17]. All spirometry measures were calculated based on the percent predicted for age, gender, height, and weight.

The original version of the TAS [18] was used in this study and it is a 26-item self-report questionnaire that is considered to be a reliable and valid measure of alexithymia [7]. This version includes the daydreaming factor, which has been eliminated from revised versions due to low item–total correlations with the total TAS score and negative correlations with the IDE score [19]. Therefore, this subscale was not analyzed in this study.

The Asthma Symptom Checklist (ASC) is a reliable and valid 36-item self-report measure of subjective asthma symptomatology and it consists of five subscales: panic–fear, irritability, fatigue, hyperventilation, and bronchoconstriction [20]. Participants rate the frequency with which symptoms occur in connection with asthma exacerbation. For the purposes of this study, though, the ASC was adapted to measure the frequency of symptoms experienced during the past week.

The Taylor Manifest Anxiety Scale (TMAS) is a 50-item true–false scale that measures trait anxiety [21]. The scale has demonstrated good reliability and validity.

Procedure

The testing session was carried out in a psychophysiology laboratory. Patients were asked to refrain from taking bronchodilator medication for 12 h prior to the testing session and not to consume caffeine on the day of the study. Testing was delayed for participants who had experienced an upper respiratory infection within the previous month. All patients signed an informed consent statement and then completed the TAS, ASC, TMAS, and spirometry testing before participating in a larger, psychophysiological study of asthma, for which they received US\$150. The appropriate institutional review boards approved the study protocol.

Statistical analyses

Pearson correlations were used to assess the relationship between the factors of the TAS, ASC, and pulmonary function measurements. All tests were two-tailed and a more stringent alpha level of .01 was used to judge significance due to the multiplicity of correlations performed. Normality was assessed using the Shapiro–Wilk test, as recommended by Stevens [22], and natural logarithms were calculated to normalize the distribution for variables that failed this test. Partial correlations were also calculated to control for the effects of trait anxiety.

Results

Table 1 shows that pulmonary function on the day of testing tended to be in the mild intermittent/persistent range [16]. Scores on the TAS subscales and total score closely resembled previously reported scores on large samples of college students [18,23].

Consistent with our hypothesis, all five correlations between TAS-IDE and report of asthma symptoms were positive, a result that would occur rarely on the basis of chance ($P = .03$, binomial test). Table 2 shows that IDE scores were significantly associated with greater report of panic–fear and fatigue during the past week, as measured by the ASC. The correlations indicated that substantial variance was accounted for (4–21%, $M = 10\%$ of variance). After controlling for the effects of trait anxiety, though, only the correlation with fatigue remained significant. No other subscale of the TAS, or the total score, correlated with the ASC.

The COM subscale of the TAS was associated with decreased pulmonary function, as indicated by %FEV₁/FVC (see Table 3). The relationship between COM scores and pulmonary function was slightly strengthened when controlling for trait anxiety. The other subscales and the total TAS score were not related to pulmonary function.

Table 4 shows that the IDE and COM subscales of the TAS were strongly correlated with each other as well as the total TAS score. The EOT subscale was weakly to modestly correlated with the IDE and COM subscales.

Conclusion

This study showed that the IDE subscale of the TAS was related to increased report of emotional symptoms (panic–fear) as well as physical symptoms (fatigue), but was not related to objective measurement of pulmonary function. On the other hand, the COM subscale was related to poorer pulmonary function, but not self-report of emotional or physical symptoms of asthma. Trait anxiety accounted for some of the variance in the relationship between the IDE score and symptom report and slightly suppressed the relationship between the COM score and pulmonary function, although this effect was small. The EOT factor was not related to any of the variables measured in this study. These results indicate that difficulty identifying and communicating feelings may both be detrimental for asthma, but they may operate via different mechanisms.

The link between the COM subscale and poorer pulmonary function was somewhat surprising. It is conceivable that individuals scoring high on the COM subscale fail to communicate asthma symptoms to physicians, thereby leading to suboptimal control of asthma. Although it is possible that inhibition of emotions may increase risk for asthma exacerbation [24], it is equally plausible that people with more severe asthma may simply restrict their emotional responses as a coping mechanism to prevent asthma exacerbation. This interpretation is consistent with evidence showing that assertiveness training is maladaptive for asthma [25].

The relationship between the IDE subscale and symptom report may be mediated by trait anxiety, which other studies have linked to increased report of respiratory symptoms [26]. This hypothesis should be formally tested in a larger, prospective study to determine whether the IDE subscale contributes unique variance to the prediction of asthma symptoms.

Regardless of the mechanisms, it is interesting to note that these findings for the IDE and COM factors are indeed both consistent with the notion that alexithymia is a complicating factor in the management of asthma [4–6].

These data also have implications for the construct of alexithymia in general. It has been proposed that the IDE and COM factors of the TAS should be combined into one subscale [11]. Although we, like others [10,11,13], did find a strong correlation between these two subscales, the distinct relationship each factor demonstrated with features of asthma and the unique finding of an association between the COM subscale and physiological parameters provide support for keeping these two subscales separate. However, the EOT subscale did not contribute to the relationship between alexithymia and asthma, which is consistent with other studies questioning the importance of this subscale in studying emotional and somatic symptoms [11,13]. Therefore, these data add to the growing body of literature questioning the utility of alexithymia as a unitary construct [11,27]. It is interesting to note that the total TAS score was not related to any dependent measures, thus highlighting the importance of examining the various alexithymic characteristics separately to understand better their relationships with disease.

Acknowledgments

This work was supported by Grant HL-44097 and Grant HL-58805 from the National Institutes of Health — Heart, Lung, and Blood Institute. The authors are indebted to Dr. Soo Borson, Dr. Nicholas Giardino, and Dr. James Scanlan for statistical advice and comments on earlier versions of this manuscript.

References

1. Sifneos PE. The prevalence of “alexithymic” characteristics in psychosomatic patients. *Psychother Psychosom* 1973;22:255–262. [PubMed: 4770536]
2. Lumley MA, Stettner L, Wehmer F. How are alexithymia and physical illness linked? A review and critique of pathways. *J Psychosom Res* 1996;41:505–518. [PubMed: 9032714]
3. Kleiger JH, Kinsman RA. The development of an MMPI alexithymia scale. *Psychother Psychosom* 1980;34:17–24. [PubMed: 7443942]
4. Dirks JF, Robinson SK, Dirks DL. Alexithymia and the psychomaintenance of bronchial asthma. *Psychother Psychosom* 1981;36:63–71. [PubMed: 7330162]
5. Kleiger JH, Dirks JF. Psychomaintenance aspects of alexithymia: relationship to medical outcome variables in a chronic respiratory illness population. *Psychother Psychosom* 1980;34:25–33. [PubMed: 7443943]
6. Brown EL, Fukuhara JT, Feiguine RJ. Alexithymic asthmatics: the miscommunication of affective and somatic states. *Psychother Psychosom* 1981;36:116–121. [PubMed: 7342161]
7. Linden W, Wen F, Paulhus DL. Measuring alexithymia: reliability, validity, and prevalence. *Adv Pers Assess* 1994;10:51–95.
8. Bagby RM, Parker JD, Taylor GJ. The twenty-item Toronto Alexithymia Scale: I. Item selection and cross-validation of the factor structure. *J Psychosom Res* 1994;38:23–32. [PubMed: 8126686]
9. Bankier B, Aigner M, Bach M. Alexithymia in DSM-IV disorder: comparative evaluation of somatoform disorder, panic disorder, obsessive – compulsive disorder, and depression. *Psychosomatics* 2001;42:235–240. [PubMed: 11351112]
10. Honkalampi K, Koivumaa-Honkanen H, Tanskanen A, Hintikka J, Lehtonen J, Viinamäki H. Why do alexithymia features appear to be stable? *Psychother Psychosom* 2001;70:247–253. [PubMed: 11509894]
11. Deary IJ, Scott S, Wilson JA. Neuroticism, alexithymia and medically unexplained symptoms. *Pers Individ Differ* 1997;22:551–564.
12. Marchesi C, Brusamonti E, Maggini C. Are alexithymia, depression, and anxiety distinct constructs in affective disorders? *J Psychosom Res* 2000;49:43–49. [PubMed: 11053603]
13. Loas G, Corcos M, Stephan P, Pellet J, Bizouard P, Venisse JL, Perez-Diaz F, Guelfi JD, Flament M, Jeammet P. The Réseau INSERM no. 494013. Factorial structure of the 20-item Toronto Alexithymia Scale: confirmatory factorial analyses in nonclinical and clinical samples. *J Psychosom Res* 2001;50:255–261. [PubMed: 11399282]
14. Rief W, Heuser J, Fichter MM. What does the Toronto Alexithymia Scale TAS-R measure? *J Clin Psychol* 1996;52:423–429. [PubMed: 8842878]
15. Lehrer PM, Hochron S, Carr R, Edelberg R, Hamer R, Jackson A, Porges SW. Behavioral task-induced bronchodilation in asthma during active and passive tasks: a possible cholinergic link to psychologically induced airway change. *Psychosom Med* 1996;58:413–422. [PubMed: 8902893]
16. National Heart Lung and Blood Institute. Expert panel report 2: guidelines for the diagnosis and management of asthma. Publication No. 97–4051. Bethesda (MD): U.S.: Department of Health and Human Services; 1997.
17. American Thoracic Society. Standardization of spirometry, 1994 update. *Am J Respir Crit Care Med* 1995;152:1107–1136. [PubMed: 7663792]
18. Taylor GJ, Ryan D, Bagby RM. Toward the development of a new self-report alexithymia scale. *Psychother Psychosom* 1985;44:191–199. [PubMed: 3837277]
19. Taylor GJ, Bagby RM, Parker JDA. The revised Toronto Alexithymia Scale: some reliability, validity, and normative data. *Psychother Psychosom* 1992;57:34–41. [PubMed: 1584897]

20. Kinsman RA, Luparello T, O'Banion K, Spector S. Multidimensional analysis of the subjective symptomatology of asthma. *Psychosom Med* 1973;35:250–267. [PubMed: 4710144]
21. Taylor JA. A personality scale of manifest anxiety. *J Abnorm Soc Psychol* 1953;48:285–290.
22. Stevens, JP. *Applied multivariate statistics for the social sciences*. 4th ed.. Mahwah (NJ): Lawrence Erlbaum; 2002. p. 256-284.
23. Lumley MA, Ovies T, Stettner L, Wehmer F, Lakey B. Alexithymia, social support and health problems. *J Psychosom Res* 1996;41:519–530. [PubMed: 9032715]
24. Alexander, F. *Psychosomatic medicine: its principles and applications*. New York: Norton; 1955. p. 132-141.
25. Hock RA, Bramble J, Kennard DW. A comparison between relaxation and assertive training with asthmatic male children. *Biol Psychiatry* 1977;12:593–596. [PubMed: 329902]
26. Dales RE, Spitzer WO, Schechter MT, Suissa S. The influence of psychological status on respiratory symptom reporting. *Am Rev Respir Dis* 1989;139:1459–1463. [PubMed: 2729753]
27. Lumley MA, Norman S. Alexithymia and health care utilization. *Psychosom Med* 1996;58:197–202. [PubMed: 8771617]

Table 1

Participants' characteristics

	Mean	S.D.
%FEV ₁	82.80	17.8
FEV ₁ /FVC	0.70	0.1
IDE	26.23	8.0
COM	18.04	5.3
EOT	13.09	3.7
Total TAS	60.05	12.1

FEV₁ = forced expiratory volume at the first second of the forced vital capacity (FVC) maneuver; IDE = difficulty identifying feelings; COM = difficulty communicating feelings; EOT = externally oriented thinking; TAS = Toronto Alexithymia Scale.

Table 2

Correlation matrix between TAS and ASC

	TAS-IDE ^a	TAS-COM	TAS-EOT	Total-TAS
Panic-fear	.31* (.12)	.00	-.03	.09
Irritability	.29 (.07)	.02	.00	.13
Fatigue	.46** (.32)*	.11	.10	.27
Hyperventilation	.20 (.10)	.09	.08	.06
Bronchoconstriction	.26 (.17)	.08	.01	.13

TAS = Toronto Alexithymia Scale; IDE = difficulty identifying feelings, COM = difficulty communicating feelings, EOT = externally oriented thinking.

^aThe correlations in parentheses represent analyses controlling for the TMAS.

* $P < .01$.

** $P < .001$.

Table 3

Correlation matrix between TAS and pulmonary function measures

	TAS-IDE	TAS-COM ^a	TAS-EOT	Total-TAS
%FEV ₁	.04	-.22 (-.26)	.01	-.13
%FEV ₁ /FVC	.00	-.30* (-.34)*	-.05	-.16
%FEF _{50%}	.05	-.27 (-.32)*	-.01	-.14
%PEF	.05	-.22 (-.29)	.03	-.12

FEV₁ = forced expiratory volume at the first second of the forced vital capacity (FVC) maneuver; FEF_{50%} = flow that occurs at 50% of FVC; PEF = maximum flow attained during the FVC maneuver.

^aThe correlations in parentheses represent analyses controlling for the TMAS.

* $P < .01$.

Table 4

Interfactor correlations of the TAS

TAS-IDE	TAS-COM	TAS-EOT	TAS-Total
TAS-IDE			
TAS-COM	.73 **		
TAS-EOT	.25	.32 *	
TAS-Total	.81 **	.81 **	.63 **

* $P < .01$.** $P < .001$.