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THE EXPERIENCE AND EXPRESSION OF ANGER AND ANXIETY IN BRONCHIAL ASTHMA PATIENTS

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Abstract: This study investigated differences between asthma patients and a control group of healthy individuals in their responses to eight measures of trait anxiety and the experience, expression and control of anger. The Inventory of Situations and Responses of Anxiety (ISRA) and a Spanish adaptation of State-Trait Anger Expression Inventory (STAXI) were administered to medical outpatients diagnosed as suffering from bronchial asthma and a control group of healthy persons closely matched for age and gender. Asthma patients had significantly higher ISRA trait anxiety scores, reported more physiological and motor anxiety, thoughts of insecurity, as well as more anxiety in relation to four different situational areas. The asthma patients also reported experiencing anger more frequently, and without provocation, than healthy persons as reflected in higher STAXI T-Anger, Angry Temperament, and Anger-Out scores. These results provide evidence of the importance of dealing with negative emotions in the treatment of bronchial asthma patients.

Key words: Anxiety, Anger, ISRA, STAXI, Bronchial Asthma.

Resumen: Este estudio investigó las diferencias entre un grupo de personas con asma bronquial y un grupo de personas sanas en sus respuestas a diferentes medidas de ansiedad rasgo y de la experiencia, expresión y control de la ira. El Inventario de Situaciones y Respuestas de Ansiedad (ISRA) y la adaptación española del Inventario de Expresión Estado-Rasgo de la Ira (STAXI) fueron administradas a pacientes con asma bronquial y a un grupo de personas sanas, equiparadas en edad y sexo. Los pacientes con asma mostraron niveles significativamente mayores de ansiedad rasgo, mayor ansiedad fisiológica y motora, más pensamientos de inseguridad, así como mayor ansiedad en las diferentes áreas situacionales evaluadas. Igualmente, los pacientes con asma experimentaron ira con mayor frecuencia que los controles sanos, con y sin provocación, informando de mayores puntuaciones en rasgo de ira, temperamento de ira, e ira externa. Estos resultados añaden evidencias de la importancia del manejo de las emociones negativas en el tratamiento de los pacientes con asma bronquial.

Palabras Clave: Ansiedad, Ira, ISRA, STAXI, Asma Bronquial.

Title: *La experiencia y expresión de la ansiedad y la ira en pacientes con asma bronquial*

Bronchial asthma is an obstructive and reversible lung disorder characterized by hyperreactivity of the respiratory tract to a variety of stimuli (Oncel, Ozer, & Yilmaz, 2012; Reed & Townley, 1978). This disorder is considered a consequence of the con-

joint expression of genetic and environmental factors that produce an inflammatory reaction, with consequent tissue dysfunction. Bronchial asthma causes reduction in bronchial function and an exaggerated response to many types of stimuli (Sociedad Española de Neumología y Cirugía Torácica, 1998). Prevalence rates in developed countries range between 3% and 7% (Dirección General de Prevención y Promoción de la Salud de la Comunidad Autónoma de Madrid, 1992). Although asthma

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death rates are not high, they are clearly increasing; they are estimated to range between 1 to 2 deaths for every 100,000 deaths (Siegel, 1987; Xu, Kochanek, Murphy, & Tejada-Vera, 2010). In the United States, the mortality rate has substantially increased from less than 2 to more than 4 per 100,000 deaths (United States Department of Health and Human Services, 1992). In a more recent study (Peters, Ferguson, Deniz, & Reisner, 2006), estimates of the prevalence of asthma range from 7% in France and Germany to 11% in the USA and 15–18% in the United Kingdom, was reported, indicating that approximately 20% of these patients had severe asthma, of which 20% is inadequately controlled.

Recent studies indicate a clear increase in the incidence of bronchial asthma with diagnosed cases currently occurring twice as often as in preceding decades (Masoli, Fabian, Holt, & Beasley, 2004). Moreover, this increase does not appear to be due to greater diagnostic precision (Burney, Chinn, & Roa, 1991). The rate of asthma increases as communities adopt western lifestyles and become urbanised. With the projected increase in the proportion of the world's urban population from 45% to 59% in 2025, there is likely to be a marked increase in the number of asthmatics worldwide over the next two decades. It is estimated that there may be an additional 100 million persons with asthma by 2025 (Masoli et al., 2004).

Numerous studies have shown that digestive, vascular and respiratory disorders, as well as disorders associated with immune system failure, such as cancer, are linked to emotional disorders (Cano-Vindel & Miguel-Tobal, 1994). Following this trend in "psychological psychomaintenance" (Kinsman, Dirks, & Jones, 1982), some researchers now recognize a certain contribution of emotions and other psychological factors to the etiology of bronchial asthma, and especially to the progression,

maintenance and comorbidity of this illness (Mosaku, Erhabor, & Morakinyo, 2006).

Among the psychological factors that can influence bronchial asthma, emotions are especially important in maintaining this illness (Kinsman et al., 1982). Emotional arousal is defined as any reaction experienced by an individual that involves an intense increase in mood or feelings. This experience can be agreeable or disagreeable, and is generally accompanied by biological changes which may, at times, be very intense. These changes are characterized by an increase in physiological arousal, especially of the somatic and autonomic nervous systems; the immune and endocrine systems may also be adversely affected. Emotional arousal may be revealed in facial changes and other observable motor behaviors, such as voice, posture, or movement (Cano-Vindel, 1995, 1997). Additionally, elevated and maintained emotional arousal is associated with less healthy behaviors, like the practice of moderate physical exercise, and more non-healthy behaviors, like smoking (Cano-Vindel & Miguel-Tobal, 2001).

While asthma patients express more negative emotions than healthy persons (Lehrer, Iseberg, & Hochron, 1993), the direction of the effects of emotions remains unclear. Emotional arousal may be the result of suffering from asthma, or individuals who suffer from asthma may experience higher levels of negative emotion, as was cogently noted by Creer (1993).

Anxiety and bronchial asthma

Anxiety contributes to bronchial asthma symptoms by means of two mechanisms (Vázquez & Buceta, 1990). The first is hyperventilation, which generally accompanies any intense emotional state, such as crying, laughing, etc. (Creer, 1979). The second mechanism that contributes to a bronchoconstriction response is caused by changes in the autonomic nervous system

that accompany emotional reactions. The asthma patient's cognitive activity is further sensitized by a multitude of intermittent stimuli that can provoke a crisis. Since asthma patients are highly aware of environmental stimuli that generate expectations about the occurrence of a crisis, this ends up causing chronic anxiety with concomitant physiological arousal.

In addition to altering pulmonary function, anxiety can also affect the patient's response to treatment as well as the evolution of bronchial asthma. In the 1970's, important studies by Kinsman et al. (1982) identified personality profiles that demonstrated the different ways in which asthmatic individuals deal with anxiety. They observed that highly anxious patients had maladaptive profiles that required more anti-asthma treatment (basically corticoids) and longer and more frequent hospitalization. These maladaptive effects of high anxiety on asthma patients were confirmed in similar studies in the 1980's (Brooks et al., 1982; Steiner, Higgs, Fritz, Laszlo, & Harvey, 1987) and have also been reported in several studies conducted in Spain (Belloch, Perpiñá, & Baños, 1991; Belloch et al., 1994; Pascual, 1995).

According to Ley (1989, 1991), "dyspneic-fear" experienced during a panic attack may be directly responsible for dyspnea-induced hyperventilation, with cognitive factors playing an important role. Porzelius, Vest and Nochomovitz (1992) found that 37% of patients with chronic obstructive illness experienced panic attacks. Asthma patients who suffered panic attacks did not differ in terms of the severity of their respiratory illness, but had more agoraphobic cognitions and greater fear of bodily sensations. Porzelius et al.'s (1992) cognitive model of panic disorder has been extended to include individuals with pulmonary illness (Carr, Lehrer, Hochron, & Jackson, 1996; Carr, Lehrer, Rausch, & Hochron, 1994).

The relationship between emotions and alterations in pulmonary function has also been examined in several correlational studies (Cano-Vindel & Fernández, 1999; Klinnert, Mrazek, & Mrazek, 1994; Silverglade, Tosi, Wise, & D'Costa, 1994), suggesting that anxiety, as well as other emotions that contribute to high arousal, may be responsible for changes in pulmonary function. Since asthma patients present a dysfunctional emotional complex that highlights the temporal relation between illness and emotion (Vázquez & Buceta, 1996; Weiner, 1987), it is important to differentiate, conceptually and operationally, between state and trait anxiety (Spielberger, 1966, 1972, 1976). State anxiety (S-Anxiety) is a transitory emotional state that varies in intensity and fluctuates over time. S-Anxiety reactions are characterized by conscious feelings of tension and apprehension, and activation and high arousal of the autonomic nervous system. Trait anxiety (T-Anxiety) refers to relatively stable individual differences in how frequently situational stressors are perceived as dangerous or threatening, and the tendency to react to perceived threats with elevations in S-Anxiety.

Anger and bronchial asthma

Recent research has shown that anger also has a strong influence on psychophysiological disorders, such as peptic ulcer and cardiovascular disease (Miguel-Tobal & Casado, 1994; Miguel-Tobal, Casado, Cano-Vindel, & Spielberger, 1997). Similar to anxiety, the influence of anger on illness appears to be due to the increased arousal of the autonomic nervous system. Anger is a unique emotion in regard to mobilizing and maintaining high energy levels and intense motor activity (Spielberger, Jacobs, Russel, & Crane, 1983). Analogous to anxiety, state anger (S-Anger) can be differentiated from trait anger (T-Anger). S-Anger is an emotional state or condition that includes subjective feelings that vary in in-

tensity from mild irritation or annoyance to intense fury or rage, with concomitant arousal of the autonomic nervous system. T-Anger refers to individual differences in the tendency to react more frequently with elevations in S-Anger (Deffenbacher, 1992; Izard, 1993; Spielberger, Krasner, & Solomon, 1988).

Mathé and Knapp (1971), using a variant of the Mood Adjective Check List, found that asthmatic university students expressed less anger than non-asthmatic students. Viney and Westbrook (1985) analyzed the content of interviews carried out with asthmatic and nonasthmatic children, and found that the asthma patients expressed more hostility, both direct and indirectly. Silverglade compared asthma patients, ages 12 to 18, with healthy individuals, and found a higher rate of hostility in the asthma patients, which was associated with the severity of their asthma. More recently, Cano-Vindel and Fernández (1999) found significantly higher levels of T-Anger in adult asthma patients as compared with a healthy control group.

The aim of the present study was to examine differences in anxiety and anger levels in individuals suffering from bronchial asthma as compared with a healthy control group. The Inventory of Situations and Responses of Anxiety (ISRA) and the State Trait Anger Expression Inventory (STAXI) were administered to asthmatic patients and a control group that was similar in age and gender. These measures have been found to be effective in previous studies for detecting differential characteristics of patients with anxiety and psychosomatic disorders as compared to healthy control groups (Miguel-Tobal & Cano-Vindel, 1995; Miguel-Tobal & Casado, 1994).

Method

Participants

The participants in this study were 65 asthmatic patients and a control group of 72 healthy individuals. All were volunteers and none were paid for their participation. The asthma patients were recruited from the Outpatient Service of the National Institute of Silicosis (Servicio de Neumología II del Instituto Nacional de Silicosis) of the Central Hospital of Asturias (Oviedo, Spain). The control group came from various milieus (neighbors' associations, residences, etc.), who were carefully matched for age and gender with the asthma patients. The characteristics of the asthma patients and healthy controls were as follows:

- Asthma group: 65 outpatients between 17 and 68 years of age (mean = 38 years): 30 were men (mean age = 40.6 years), 35 were women (mean age = 35.4 years).

- Control group: 66 healthy individuals between 18 and 74 years of age (mean = 37.9 years). The group consisted of 29 men and 37 women (mean ages = 40.1 and 35.7 years, respectively).

Instruments

The short version of the ISRA (Miguel-Tobal & Cano-Vindel, 1986, 1988, 1994) assesses the frequency with which cognitive, physiological and motor agitation responses are experienced when dealing with stressful life situations. These included: (1) thoughts and feelings of worry, fear, apprehension, and insecurity; (2) arousal of the autonomic and somatic nervous systems; and (3) motor agitation responses. The ISRA provides measures of trait anxiety, the triple response system and four different situational areas associated with anxiety.

The experimental Spanish adaptation of the STAXI, developed by Miguel-Tobal, Cano-Vindel, Casado and Spielberger (1992, 2001), was also administered to all individuals. It is based on the original version of the STAXI (Spielberger, 1988,

1991), consisting of five scales that assess the intensity of state anger at a particular time and individual differences in trait anger, anger expression, and anger control. The T-Anger scale comprised two subscales: Angry Temperament (experience of anger without specific provocation), and Angry Reaction (experience of anger when criticized or treated unfairly). Anger expression and control were measured with three STAXI trait scales: Anger-In (frequency of angry feelings being held in or suppressed), Anger-Out (frequency with which angry feelings are expressed towards other people or objects in the environment), and Anger Control (frequency of attempts to control anger expression). Total anger expression was assessed by the Anger Expression (AX) Index.

Procedure

The asthma patients were contacted at the hospital outpatient service and were assessed after they saw their doctor. In order to be included in the asthma group, the patients had to meet the following criteria: (1)

diagnosis as suffering from bronchial asthma by a specialized physician; and (2) not suffering from any other psychophysiological or psychological disorder. The requirements for inclusion in the control group were that the person was not currently suffering or had not previously suffered from bronchial asthma or any other psychophysiological disorder, and was not presently or previously diagnosed with any psychological disorder.

The two inventories were administered individually after interviewing each participant to ensure that he or she met the inclusion criteria for the patients or healthy control groups. During the interview, participants were informed about the nature of the study and asked to sign a consent form, indicating that they volunteered to take part in the study.

Results

The means and standard deviations of the anxiety measures for the asthma pa-

Table 1. Means, standard deviations, and *t*-test values of the significant differences between the ISRA scores of asthma patients and the control group.

Variable	Means		Stand.Deviations		<i>T</i> -Test t-test	Significance Level sig.
	Asthma	Control	Asthma	Control		
Cognitive Anxiety	15.00	9.60	5.08	6.12	3.91	.000
Physiological Anxiety	15.43	6.31	6.44	4.88	6.56	.000
Motor Anxiety	11.12	7.28	4.16	3.65	4.02	.000
Trait Anxiety	41.55	23.19	13.10	11.98	5.99	.000
Test Anxiety	14.87	9.48	4.74	3.88	5.11	.000
Interpersonal Anxiety	4.06	2.54	2.36	1.91	2.90	.005
Phobic Anxiety	6.71	4.08	3.05	2.82	3.67	.000
Daily Life Anxiety	3.96	1.31	2.30	1.34	5.69	.000

tients and the control group are reported in Table 1. Mean differences between asthma patients and healthy controls were evaluated by *t*-tests. Highly significant differences were found for all eight ISRA anxiety scales ($p \leq .005$). The scores of the asthma patients were much higher on all of the anxiety measures, especially on the Physiological and Trait Anxiety Scales, as well as in Test and Daily Life Anxiety Scales (two of the four situational areas).

The results for the anger measures are reported in Table 2. Statistically significant differences between the asthma patients and healthy control were found for four anger measures: Trait Anger, Angry Temperament, Anger-Out, and the Anger Expression Index. The asthma patients reported higher scores on all four of these anger measures and especially on the Anger Temperament Subscale, which contributed to the significant difference in Trait Anger. It is interesting to note that the asthma patients had slightly lower scores on state anger and anger control, but these differences

were not statistically significant.

Discussion

The findings of this study demonstrated that it is common for asthmatic patients to experience both anxiety and anger. In previous studies of anxiety in asthma patients, only findings for trait anxiety have been reported (Avia, 1989; Nouwen, Freeston, Cournoyer, Deschesnes, & Boulet, 1994; Rietveld & Prins, 1998; Valdés, Flores, Tobeña, & Massana, 1983), demonstrating the crucial influence of anxiety in asthma adults (Picado, Montserrat, de Pablo, Plaza, & Agustí-Vidal, 1989), as well as in children and adolescents (Butz & Alexander, 1993). The current study provides information on broader indexes regarding three anxiety response systems as well as different situational factors. Asthma patients had higher anxiety scores than healthy individuals in trait anxiety, and more thoughts of insecurity as measured by the ISRA Cognitive Anxiety Scale.

Table 2. Means, standard deviations, and *t*-test values of the significant differences between the STAXI scores of asthma patients and the control group

Variable	Means		Stand. Deviations		T-Test	Significance Level
	Asthma	Control	Asthma	Control	t-test	sig.
State Anger	10.93	11.93	1.90	4.36	-0.59	.559
Trait Anger	20.34	17.54	6.28	3.31	3.36	.002
Angry Temperament	7.25	5.42	2.70	1.48	3.46	.001
Angry Reaction	9.46	8.30	3.27	2.37	1.66	.103
Anger In	16.59	15.05	3.80	3.40	1.75	.086
Anger Out	16.59	13.69	4.95	3.57	2.79	.007
Anger Control	20.75	22.28	4.75	5.81	-1.18	.244
Anger Expression	28.43	22.60	9.01	8.25	2.77	.007

The findings of this study also confirmed previous results reported by Cano-Vindel and Fernández-Rodríguez (1999), demonstrating that asthma patients scored significantly higher than controls in cognitive, physiological and motor anxiety, trait anxiety, and the four situational areas measured by the ISRA. These findings confirm a typical anxiety profile regarding the three response systems and the four situational areas previously identified in studies of other psychophysiological disorders, such as hypertension, gastric ulcer, headaches and skin disorders (Cano-Vindel & Miguel-Tobal, 1990; Amorin, Cano-Vindel & Miguel-Tobal, 1996). In addition, the findings of this study indicated that asthma patients showed a higher degree of self-monitoring of anxiety-related physiological arousal, as compared with cognitive and motor responses. Such results support an explanatory model (Cano-Vindel & Miguel-Tobal, 1991) which assumes that the onset and maintenance of psychophysiological disorders is influenced by high levels of physiological arousal that are frequently experienced in daily situations.

The importance of anger in cardiovascular (Miguel-Tobal & Casado, 1997; Miguel-Tobal et al., 1997) and gastric ulcer (Miguel-Tobal & Casado, 1997; Sharma, Gosh, & Spielberger, 1995) disorders has been shown in previous research. In the present study, new findings regarding the experience, expression and control of anger in asthma patients were reported. The asthma patients in this study differed from the control group in their general tendency to experience and express anger without specific provocation (angry temperament) and in expressing anger towards other persons and objects in the environment (anger-out). The asthma patients were also higher in T-Anger (i.e., the frequency that they experienced anger). These findings con-

firmed previous results reported by Cano-Vindel and Fernández-Rodríguez (1999) and were also consistent with other research that has reported higher levels of negative emotion in asthma patients (Amorin et al., 1996; Cano-Vindel & Miguel-Tobal, 1990, 1994; Creer, 1993; Kinsman et al., 1982; Lehrer et al., 1993; Schmaling, McKnight, & Afari, 2002).

In summary, the asthma patients in this study showed a similar anxiety profile to those found for patients with other psychophysiological disorders. However, their anger profile differed from disorders such as hypertension in that the asthmatic patients were more anger-expressive than hypertensives. To clarify the effects of anxiety and anger on bronchial asthma and to establish therapeutic strategies for dealing with the adverse effects of negative emotions in asthma patients, additional research is needed. For an accurate diagnosis and treatment of bronchial asthma, it is essential to take into account the presence of the emotional components of this disorder. Given the demonstrated manifestations of both anxiety and anger in bronchial asthma patients, psychological intervention strategies should be included in the treatment of this illness not only with adult patients, but also with children and adolescents.

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