

## **Behavioural and emotional differences in groups of child and juvenile chronic patients**

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### **ABSTRACT**

This study aims at assessing and comparing the presence of emotional and behavioural factors in some child and juvenile chronic diseases such as asthma, diabetes and other allergic pathologies. The sample population consists of 201 asthmatic patients, 30 individuals affected by diabetes *mellitus* and 50 patients with other allergic pathologies. All the participants filled in a socio-demographic survey and the *Cuestionario de Conductas Problemáticas del Asma* (CCPA) (Asthma Problem Behaviour Questionnaire). The results show that asthmatic children and teenagers show more signs of *precipitating behaviours, psychological consequences, adverse effects and consequences in social and/or occupational life* than patients suffering from diabetes or other allergic pathologies such as rhinitis, conjunctivitis or allergic rhinoconjunctivitis. In the same way, diabetic patients show significantly higher scores in factors such as *precipitating emotions, self-management behaviours, social response and family consequences*. Therefore, the presence of psychological factors such as *adherence to treatment, health habits, social response, adverse effects and family consequences* seems to be more conditioned by the chronicity element and is equally present in groups of chronic patients with similar characteristics.

*Key words:* Asthma, diabetes, rhinitis, conjunctivitis, emotional and behavioural factors, children, adolescents..

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### **INTRODUCTION**

Illness has stopped being a purely biological concept to become a biological, psychological and social dimension, especially when we are referring to a chronic disease. Consequently, its comprehension and the way to deal with it has to be from a multidisciplinary perspective, with the contribution of different sciences and with the intervention of a variety of professionals, which surpasses the purely medical field. This fact becomes really important in the child environment, in which school, family and the social context where the child develops are especially important. Furthermore, treatment become more complicated in children, whose lack of years make it necessary to involve parents and people close to them so that they adapt to the child's new situation of illness. As for the factors affecting the adaptation to illness, it is worth pointing out: the disease itself, the child's individual characteristics and environmental factors (Johnson, 1985).

In addition to these, it is also pertinent to draw attention to the relevance of the communication of diagnosis and a series of other factors such as physical, psychological or social tension, the child's genetic constitution, his or her body features, developmental abilities and past experiences, including that of other diseases (Levine, Carey, Crocker and Gross, 1983).

Emotional factors also play a relevant role in the development and prognosis of a disease. For example, the research group led by Miller and Wood (Miller & Wood, 1994; Miller, Wood, Lim, Ballow & Hsu, 2009) has shown that the emotional response and physiological reactivity of asthmatic children while watching the film ET is associated with an increase of bronchial hyper-reactivity and to a decrease in lung performance. In this line, other authors have also checked how some specific emotions can trigger asthmatic exacerbation. Thus, Ponder and Guill (1993) showed that laughter and panic made it possible to provoke an asthmatic crisis at a camping site. Creer *et al.* (1988) concluded that weeping and laughing could trigger asthma, whereas coughing and sneezing could be both symptoms and precipitating factors.

Apart from this, in the area of diabetes, the emotional activation that provokes the stress plays a very important role in the destabilization of metabolic control, as stress can unbalance the glycemic index through a direct effect (adrenaline, noradrenaline or cortisol secre-

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tion), or an indirect effect (inappropriate habits such as having an unbalanced diet or oversights in the prescribed medication, etc.) (Méndez and Beléndez, 1994).

To a greater or lesser extent, the former variables modulate the psychological repercussions brought about by chronic diseases. Nevertheless, they are most often associated with general discomfort as a result of experiencing the symptoms and the limitations the ailment entails, which may produce stress for the patient and the experience of a number of negative emotions. In addition to this, we need to add the serious collateral effects that usually accompany chronic child and juvenile diseases, such as financial cost, conflicts in family dynamics or emotional problems (Pascual, 1995). Some of the chronic disease factors associated with the appearance of emotional problems in chronic patients are, among others, living with a debilitating and painful chronic disease, fear of dying, pain, the need for hospitalization periods, everyday routine care, loss of autonomy, the financial problems brought about by the disease, changes in family and social relationships and real or imaginary isolation (Bussing & Burket, 1993; Jensen, 1995).

In this line, a large number of works point out that in addition to stressful everyday events, being a diabetic implies being exposed to other additional specific sources of stress, such as complex self-care demands, occasional lack of specification in the diet to follow, daily treatment demands, insulin shots, constant blood glucose level monitoring, permanent decision taking when such levels change, and social pressures not to follow the diet (Johnson, 1992; La Greca *et al.*, 1995; Méndez & Beléndez, 1994).

Various studies discuss the presence of psychiatric problems or emotional alterations in this population (Collins *et al.*, 2008; Sarafino, 1990; Zashikhina & Hagglof, 2007). Fowler, Johnson, & Atkinson (1985) showed that children with some chronic disease had significantly poorer performance levels than healthy children, and had a higher rate of school problems; for example, grade repetition, need of support lessons or low academic achievement. Furthermore, other studies add that being affected by a chronic disease can affect other people's perception of the child, which brings about different treatment that may affect the child's behaviour (Creer, Stein, Rappaport, & Lewis, 1992). Thus, for example Drotar (1993) points out that having to take medication at school may contribute to the child's awareness of being different and cause difficulties of social adjustment. The continuous need for medication and the interference of the disease in the patient's life style is especially hard for teenagers, who usually react with negation, anger and lack of fulfilment (Brenner, 1991).

There is a generalized agreement that children with chronic diseases show more emotional problems than healthy children (Hysing, Elgen, Gillberg, Lie, & Lundervold, 2007; Hysing, Elgen, Gillberg, & Lundervold, 2009; Rajesh, Krishnakumar, & Mathews, 2008). This is illustrated by the studies conducted by Lozano & Blanco (1996), which compare asthmatic children, healthy children and others with chronic diseases and find that asthmatic children show more emotional disorders. For example, Lozano (1994) found that asthmatic children were, like their mothers, those who had a less stable personality, and were more introverted in comparison with healthy children and with others with

chronic pathologies, even though the differences were not statistically significant. It also stood out that the children belonging to the other chronic disease group more often showed depression than asthmatic children, who had worse self-esteem and social competence.

Along the same line, Holden, Chmielewski, Nelson & Kager (1997) found that children with disorders have five times as many probabilities to develop behavioural adjustment problems than healthy children. Shaw (1996) pointed out that the most relevant emotional consequences of a physical disease are anxiety, fear of dying, guilt and the wish to be punished, anger and resentment, self-condescension, the wish to have a normal life, drop in self esteem and frustration. Forero, Bauman, Young, Booth & Nutbeam (1996) also concluded that asthmatic children and teenagers reported more emotional reactions than their healthy counterparts, such as feeling depressed, unhappy and lonely, nervous and in a bad mood. The work on asthmatic teenagers by Alvim *et al.* (2008) determined that the prevalence of behavioural and emotional difficulties was greater than in non asthmatic teenagers.

Specifically in the childhood sphere, Bussing, Burket Kelleher (1996) studied the presence of emotional problems in asthmatic children and their relationship with asthmatic seriousness and medical comorbidity. They assessed children aged 5-17 years old, who were separated into various groups: children with chronic disease; children without any chronic disease; children with asthma and some other chronic disease associated with asthma, such as hearing infections, pneumonia, rhinitis, conjunctivitis or eczema; children with this chronic disease but without asthma, and children with asthma only. They concluded that children with severe asthma and another associated chronic disease had a greater risk of suffering from emotional and behavioural conflicts than children without any chronic condition, and were out of step academically and missed school more often. They also found that children with severe asthma were more likely to show emotional, behavioural and learning problems than children with slight or moderate asthma. In the same way, Rietveld, Van Beest & Prins (2005) selected a wide teenage sample with the goal of comparing the presence of depression and anxiety symptoms between teenagers suffering from various chronic diseases and healthy teenagers. They pointed out that the asthmatic group had significantly higher scores in panic attacks.

There is also a large number of research studies dealing with the emotional repercussions of diabetes. Méndez & Beléndez (1994) underline the repercussions the treatment has on the individual's social sphere, such as the stigma of being ill, feeling to be different from the others, and having to struggle against the general population's lack of knowledge and wrong ideas about diabetes. In the same way, Sudhir, Kumaraiah, Munichoodappa, & Kumar (2001) argue that managing diabetes is particularly difficult during adolescence, as the course of the disease and its influence on the subject's physiological growth may have a high impact on the teenager's psychological development.

Furthermore, the limitations on the style of life not only affect the patient but also involve the family. Patient and family need to cope with economic, social and emotional problems (Mitchell *et al.*, 2009). Family relationships become seriously affected, as many aspects of everyday life change due to the disease (Sudhir *et al.*,

2001). The study by Canonica, Mullol, Pradalier, & Didier (2008) confirmed that patients with allergic rhinitis reported sleeping disorders, tiredness, irritability and a wide range of problems. The patients studied perceived that their symptoms modified their daily performance and affected a considerable part of the day, especially the mornings, when the symptoms were more severe. In this same line, Sacchetti *et al.* (2007) assessed the impact of severe allergic conjunctivitis on the quality of life of 30 children affected by the disease and summarized that most of the patients reported itching, burning, blushing, need to use eye drops, weeping and photophobia. Furthermore, the children found limitations to go to the swimming pool, to do sport and to make friends.

Given the implication of chronic disease psycho-social repercussions in their assessment and prognosis, this study seeks to assess and compare the presence of behavioural and emotional factors in various child and juvenile chronic diseases such as asthma, diabetes or allergic conjunctivitis.

**MÉTHOD**

**Participants**

In order to meet the goals established, we selected a total number of 281 patients, who were divided into the three groups as shown in Table 1.

Group A consisted of 201 asthmatic people. There was an attempt to respect the proportion of genders in the sample, so there were 52% boys and 48% girls. All of them had been diagnosed and treated for extrinsic bronchial asthma by the specialist team of the Servicio Regional de Alergia e Inmunología Clínica del Hospital Universitario "Virgen Macarena" de Sevilla (Allergy and Clinic Immunology Regional Service at Seville's Virgin Macarena University Hospital). This group was gathered together over four and a half years with the aim of controlling and eliminating, as an extraneous variable, the seasonal character of asthma

Group	Disease	Amount	Age range	Ages grouping the largest number of patients
A	▪ Asthma	201	8-16	11, 12 and 14
B	▪ Allergic rhinitis ▪ Allergic conjunctivitis ▪ Allergic rhino-conjunctivitis	50	8-16	15 and 13
C	▪ Insulina dependent diabetes <i>mellitus</i>	30	8-16	11 and 13

**Table 1. Demographic characteristics of the groups in the sample**

The two other groups consist of children affected by chronic diseases whose course and physical limitations make them different from asthma but which share characteristics similar to those of asthma, such as being a non-visible disease, having relapses, demanding health care and family attention similar to those of asthma, needing few hospitaliations, not requiring surgical intervention, without any fatal prognosis, or with the implication of some genetic predisposition.

Group B consisted of 50 children and teenagers affected by other allergic pathologies, 62% boys and 38% girls. All of them had been diagnosed and treated for allergic rhinitis, allergic conjunctivitis or allergic rhinoconjunctivitis by the specialist team of the Servicio Regional de Alergia e Inmunología Clínica del Hospital Universitario "Virgen Macarena" de Sevilla (Allergy and Clinic Immunology Regional Service at Seville's Virgin Macarena University Hospital). The sample was gathered together over one and a half years. The aim was to eliminate the possibility that the results might be attributed to the atopic character of asthma, since many asthmatic children in the sample had other associated allergic symptoms, such as rhinitis and/or conjunctivitis.

Group C consisted of 30 patients diagnosed and treated for insulin dependent diabetes *mellitus* by the specialist team of the Servicio Regional de Alergia e Inmunología Clínica del Hospital Universitario "Virgen Macarena" de Sevilla (Allergy and Clinic Immunology Regional Service at Seville's Virgin Macarena University Hospital). The sample consisted of 70% boys and 30% girls, and was gathered together over one year.

The following were the inclusion criteria for the three groups: 1) being 8-16 years of age; 2) being diagnosed and treated for the disease characterizing the group, specifically extrinsic bronchial asthma, on the basis of the American Thoracic Society and the International Consensus Report on Diagnosis and Treatment of

Asthma, established for various degrees of severity (National Heart, Lung and Blood Institute, National Institutes of Health, 1995 and 2003) (Group A), allergic rhinitis, allergic conjunctivitis or allergic rhinoconjunctivitis (Group B), and insulin dependent diabetes *mellitus* (Group C), and 3) regularly attending external consultation at the unit where the diagnosis and treatment was been carried out, in order to control the 'medical attention' variable.

The exclusion criteria were the following for all the groups: suffering from mental deficiency, from a psychopathological disorder, from an associated chronic disease, being hospitalized and having gone through traumatic experiences over the last six months.

**Procedure**

The three groups of patients underwent the following the selection and derivation process: in the case of patients with asthma (Group A) and with other allergic pathologies (Group B), the first step was to revise the clinical histories of the patients who were going to consult the doctor that day. This first step was designed once it had been checked that there was not any specific administrative criterion to arrange an appointment and starting from the basis that all the patients going to that Health Service had the same probability to be selected. As for the diabetic patient group (Group C), all the clinical histories were reviewed by a specialist doctor, and so the patients meeting the inclusion criteria required were selected.

In groups A and B, if the patient met the inclusion criteria required, the allergist specialist was sent a written note about the patient's history which said that the patient met the requirements for the study. The health specialist explained to the patient and his or her family during consultation that, as a part of the attention given by the Allergy Service, the patient was being assessed

psychologically and that it would be a good thing to participate in the research study. If the patient agreed, the doctor sent him or her to the psychological assessment team. In Group C, the specialist doctor got in touch with the patient and parents by telephone and told them that as a part of the attention given by the Endocrinology Service, the patient was being assessed psychologically, which was part of a research study. If the patient and his or her family agreed, the endocrinologist sent the patient to the psychological assessment team.

In the three groups, the assessment team arranged an appointment with the patient and his or her parents in order to carry out the psychological assessment. Most often, the appointments were arranged in the afternoon in order to avoid school absenteeism and due to the greater room availability at this time of the day.

During this appointment the consent form was filled in and the patients were interviewed. Basic clinical and sociodemographic data were collected and the patient was given instructions about the way to complete the "Cuestionario de Problemas Conductuales de la Enfermedad" (a Behavioural Problems Illness Questionnaire) and asked to carefully read and answer each one of the items of the instrument. In some cases, the interviewer had to make clarifications about an item or to resort to a synonym in order for the patient to be able to understand the item.

### **Instruments**

After having explained the purpose of the study to the participants and once the clinical and socio-demographic data had been collected, we applied the *Cuestionario de Conductas Problemáticas del Asma (CCPA) para niños* (Asthma Problem Behaviour Questionnaire), which is derived from the "Asthma Problem Behavior Checklist" (APBC), created by Creer, Marion and Creer in 1983 at the Children's Asthma Research Institute and Hospital in Denver (Creer *et al.*, 1989).

The CCPA has been validated by Rubio, Pérez, Conde and Blanco (2004) with the child and juvenile asthmatic population in Spain. The conclusion is that the instrument is valid and reliable to detect behavioural problems associated with asthma in children and youths suffering from this illness. The reliability of the instrument was determined through the internal consistency of the measures and its stability by means of the test retest method, which gave a Cronbach's alpha of 0.865 and a test – retest correlation of 0.866. It consists of 76 items which are answered in a scale ranging 1 (never) to 5 (always), and which are grouped into the following areas: adherence to treatment (e. g. *Do you follow your medication instructions carefully?*), health habits (e.g. *Do you practise sport regularly?*), behaviour precipitating the disease (e.g. *Can any of the following conducts bring about an asthmatic crisis?: Laughing?*), emotions precipitating the disease (e.g. *Can any of the following factors bring about an asthmatic crisis?: Fear?*), disease self management behaviours (e.g. *Do you initiate treatment as soon as you detect a fit?*), social response to the disease (e.g. *When you have an asthmatic crisis, does anybody from this list help you to manage it more rapidly and more effectively? For example, someone in your family, parents, siblings...?*), psychological consequences in the child or teenager e.g. *Do you think or feel that asthma is the core of your life?*), adverse effects of medication (e.g. *Do you experience any of the following physical changes after having initiated treatment for*

*your asthma? For example, loss of appetite?*), family consequences of the disease (e.g. *Are your family activities centred on your asthma?*) and consequences of the disease in the social and/or occupational life of the patient and family (e. g. *Do you or any member of family experience any difficulties with the following factors due to your asthma? For example, at work?*).

Some items were slightly modified for the groups of diabetic patients and patients suffering from other allergic pathologies. Specifically, when the term 'asthma crisis' appeared, it was substituted by 'glycemia crisis' or 'allergy crisis' according to the illness. For example, in the item *Do you think that you can always foretell when you are going to have an asthma crisis?*, the expression 'asthma crisis' was changed into 'allergy crisis' or 'glycemic crisis' and so read: *Do you think that you can always foretell when you are going to have an allergy crisis?* or *Do you think that you can always foretell when you are going to have a glycemic crisis?*, according to whether the illness was rhinitis, allergic conjunctivitis or diabetes.

### **Data analysis**

To check to see if there were statistically significant differences among the three groups of illnesses (asthma, diabetes and other allergic pathologies) as regards the factors included in the CCPA, means and standard deviations were found which were typical of each one of the groups in each variable. Levene's statistical test was applied and then a parametric statistical test (analysis of variance) or a non parametric one (Kruskal-Wallis H test) depending on the homogeneity of variance. Later on, in order to determine between which groups there were differences, Scheffé's contrast method or the Mann-Whitney's U test were applied according to the kind of distribution of the variable to compare, namely parametric or non parametric.

### **RESULTS**

As shown in Tables 2 and 3, the comparison of measures shows the following results:

On the basis of the Mann Whitney U test, the *asthma group* significantly differs from the rest of the groups in *precipitating behaviour* variables and in the *social consequence* variables (*consequences of the disease in the social and/or occupational life of the patients and/or family*). The asthma group obtains the highest mean in both factors. As for the *adverse effect* variable, Mann-Whitney's U test determines that only the *asthma group* and the *other adverse pathology group* are significantly different from each other.

The application of the post-hoc test in the *social response area* and that of Mann-Whitney's U test in the *family consequence area* accounts for the significant differences between the *other allergic pathology group*, which obtained the lowest mean in both variables, and the rest of the groups,

As for the *psychological consequence variable*, the Mann-Whitney procedure establishes that the *other allergic pathology group* significantly differs from the rest of groups in this variable, whose highest score corresponds to patients with asthma.

The *diabetic group* differs significantly from the rest of groups in the *precipitating emotion variable*, as shown by Mann-Whitney's U test, and represents the highest score in this variable and in the *self-management variable*, as shown by Scheffé's test, as they carried out

the biggest number of self-management behaviours.

		Mean (SD)	Contrast statistic	p
<b>Adherence to treatment</b>	Asthma	4.22 (0.61)	4.60	.10
	Diabetes	4.49 (0.38)		
	Other allergic pathologies	4.25 (0.67)		
<b>Health habits °</b>	Asthma	4.32 (0.46)	.81	.44
	Diabetes	4.43 (0.48)		
	Other allergic pathologies	4.34 (0.38)		
<b>Precipitating behaviours</b>	Asthma	2.27 (0.86)	68.23	.00**
	Diabetes	1.66 (0.50)		
	Other allergic pathologies	1.28 (0.27)		
<b>Precipitating emotions</b>	Asthma	1.60 (0.72)	40.94	.00**
	Diabetes	1.89 (0.93)		
	Other allergic pathologies	1.04 (0.10)		
<b>Self-management behaviours °</b>	Asthma	3.63 (0.09)	4.598	.01**
	Diabetes	3.95 (0.43)		
	Other allergic pathologies	3.57 (0.54)		
<b>Social response °</b>	Asthma	2.74 (0.86)	19.78	.00**
	Diabetes	2.80 (0.71)		
	Other allergic pathologies	1.94 (0.76)		
<b>Psychological consequences</b>	Asthma	1.60 (0.52)	47.46	.00**
	Diabetes	1.49 (0.31)		
	Other allergic pathologies	1.15 (0.17)		
<b>Adverse effects</b>	Asthma	1.27 (0.36)	21.10	.00**
	Diabetes	1.19 (0.31)		
	Other allergic pathologies	1.05 (0.11)		
<b>Family consequences</b>	Asthma	1.70 (0.51)	47.45	.00**
	Diabetes	1.82 (0.39)		
	Other allergic pathologies	1.23 (0.30)		
<b>Social and/or occupational consequences</b>	Asthma	1.95 (0.95)	52.44	.00**
	Diabetes	1.26 (0.45)		
	Other allergic pathologies	1.10 (0.31)		

Note: ° Variables following a parametric distribution, \*\*  $p \leq .01$

Table 2. Comparison between the groups of child and youth chronic patients. Variance analysis and Kruskal-Wallis non parametric test H

	Contrasted groups	Contrast statistic	p
Precipitating behaviours	Asthma/Other allergic pathologies	1728.00	.00**
	Asthma/Diabetes	1219.00	.00**
	Diabetes/Other allergic pathologies	411.00	.00**
Precipitating emotions	Asthma/Other allergic pathologies	2403.50	.06
	Asthma/Diabetes	1219.00	.00**
	Diabetes/Other allergic pathologies	219.50	.00**
Self-management behaviours	Asthma/Other allergic pathologies	5.517E-02	.83
	Asthma/Diabetes	-.32*	.01**
	Diabetes/Other allergic pathologies	.37*	.02*
Social response	Asthma/Other allergic pathologies	.80*	.00**
	Asthma/Diabetes	-5.9577E-02	.93
	Diabetes/Other allergic pathologies	-.86*	.00**
Psychological consequences	Asthma/Other allergic pathologies	1951.00	.00**
	Asthma/Diabetes	2801.00	.53
	Diabetes/Other allergic pathologies	252.50	.00**
Adverse effects	Asthma/Other allergic pathologies	3055.00	.00**
	Asthma/Diabetes	2550.00	.15
	Diabetes/Other allergic pathologies	597.00	.06
Family consequences	Asthma/Other allergic pathologies	2115.50	.00**
	Asthma/Diabetes	2472.00	.11
	Diabetes/Other allergic pathologies	180.00	.00**
Social and/or occupational consequences	Asthma/Other allergic pathologies	2142.00	.00**
	Asthma/Diabetes	1724.00	.00**
	Diabetes/Other allergic pathologies	576.50	.02*

Note: ° Variables following a parametric distribution, \*\*  $p \leq .01$ , \*  $p < .05$

Table 3. Comparison between child and youth chronic patient groups. Scheffé's post-hoc test and Mann-Whitney's U test.

## DISCUSSION

Our findings show differences in the wide majority of emotional factors assessed on the basis of the chronic disease studied, asthma, diabetes or other allergic pathologies.

No significant differences were found among the three disease groups in reference to the *adherence to medication and health habits* factor. The three means are high, but it is worth pointing out that the highest corre-

sponds to the *diabetic group* and the lowest to the *asthmatic patients' group*.

The application of self-care questionnaires allowed Frey (1996) to state that general health behaviour is related to the state of health. This author also found in diabetic and asthmatic children that a better management of the disease favours better perception of their state of health, better physical and mental state and better metabolic control. This coincides with our findings in the diabetic group, as diabetic patients show the highest mean in the *self-management behaviour* area and maintain a significant difference with the two other groups. Diabetic patients also have the highest mean in the *health habits* factor and show fewer *psychological consequences* than the asthmatic group.

Shortcomings in health behaviour or health habits are equally dangerous for children with asthma, with other allergic pathologies and with diabetes. Frey, Guthrie, Loveland-Cherry, Park & Foster (1997) conducted a study on the relationship of risk behaviour in 155 teenage diabetic patients and showed that a high percentage of the sample reported alcohol abuse, unprotected sex and cigarette smoking.

The asthmatic group is the one with the highest number of *precipitating behaviours*, followed by the diabetic group and the other allergic pathology group. All of them differ from one another significantly. As for *precipitating emotions*, the diabetic group, which is the one reporting the largest number of precipitating emotions, shows a relevant difference with the two other groups.

Even though diabetes is also affected by stress and other emotional states, the term *psychosomatic* is closer to asthma (Hindi-Alexander, 1983). As a matter of fact, it had long been considered that emotional factors were the direct originators of the disease. However, our studies, in line with the ones obtained by Delameter (1992), show that emotions are more present in diabetic patients and, as the author draws attention to, stress can have catastrophic effects, as it is a significant factor that contributes to disrupting metabolic control, which can occur directly by means of physiological mechanisms such as counterregulatory hormones, or indirectly by affecting the therapeutic completion, or through both ways (Silverstein *et al.*, 2005). Unfortunately, the generalization of the results is limited by the fact that the studies seeking to show the effects of psychological stress on diabetic youths have used only small population samples.

In this same line, many research studies (Helgeson, Escobar, Siminerio & Becker, 2010, Schilling, *et al.*, 2009) have determined that lack of emotional stress management is related to worse metabolic control. In this sense, excessive physiological activation leads to an increase in the levels of cholesterol, triglycerides, and ketone bodies that the diabetic patient is not prepared to counterregulate.

But not all diabetic patients respond to stress in the same way. Méndez & Beléndez (1994) reviewed some works referring to the effect of stress on the glucose level in blood and concluded that there was a great difference in the metabolic vulnerability to stress found in insulin dependent subjects. Such differences depended, among other things, on the strategies to cope with stress and on the characteristics of the stressful stimuli. As held by Méndez & Beléndez (1984), this sensitivity to emotional factors can be accounted for by the collat-

eral effects of the treatment such as hypoglycaemic episodes which occur quite often in insulin dependent diabetic patients, who, thus, develop fear towards hypoglycaemia. These authors dealt with a series of studies seeking to account for the factors involved in the development of this fear and, among others, they emphasized the following: previous experience of hypoglycaemic episodes, uncertainty about possible future complications, difficulties to differentiate between a number of symptoms, feelings of frustration in face of unexplained high glycaemia levels, or aversive physical, cognitive, motor and social repercussions brought about by hypoglycaemic episodes.

There is a significant difference between diabetic patients with those of the rest of the groups. The diabetic group was able to carry out a larger number of *self-management behaviours*. Milousheva, Kobayashi, & Matsui (1996), found sex related differences in strategies to cope with the disease in 43 children, teenagers and young diabetic patients, which were measured by a coping strategy questionnaire. The strategies most often used by males were *avoidance behaviour*, followed by *cognitive distraction* and *distractive behaviour*. The behaviours most often reported by the female group were *searching for social support*, that is, discussing the issue with friends, and *distractive behaviour*, which were followed by *aggressive attitudes*.

This difference in self-care abilities towards the illness can constitute a risk element for the two other groups of patients, especially for the asthmatic group, as the emotional and behavioural problems related to the control of the disease, such as family disfunction or conflicts, poor adherence to medication, insufficient self-care or symptom perception problems are implied in asthmatic mortality (Lehrer, Sargunraj & Hochron, 1992).

This fact can also account for self-care behavioural differences between the asthmatic and diabetic groups at the onset of both pathologies. As mentioned above, the onset of diabetes is usually more abrupt than that of asthma. From that very moment, the action carried out by the health care personnel is basically oriented to make the patients and their families become aware of the chronic condition, of the importance of fulfilling the prescribed medical guidelines, and the management of the disease. This series of events, which do not take place at the onset of asthma, may actually be rather shocking in the short term; however, they will bring about a greater assimilation of the problem in the long run, and so directly fall under the individual's control of his or her illness.

All of this leads to the fact that the diabetic patient is aware of his or her condition from the very onset of his ailment and, therefore, has learnt all he or she has to do in spite of the fact that the care related to the illness requires rather technical and specialized action. On the other hand, it is a fact that months and even years may pass between the first wheezing, the first dyspneas, the first bronchodilators, and the first time that an asthmatic patient hears the word *asthma*. Up to that moment, what the patient has heard his or her mother say is just *My child only has bronchitis*, or *The coughing is just an allergy*.

Managing diabetes also requires greater rigour in self care activity. Improving control over diabetes involves daily glucose control, insulin injections, diet adherence and physical exercise. As a consequence, as

recommended by Faulkner (1996), the self management tasks that diabetic patients need to be trained in are learning about diabetes, about insulin doses, its administration, monitoring glucose level, keeping to a diet, doing exercise, assuming degrees of responsibility and taking decisions. It is the health care system, by means of its strict and rigorous medical revisions, that is responsible for reminding the child and teenage diabetic patient, for making them aware of their chronic condition and need for self care. Diabetic children can assume a significant role in their care of diabetes around age 12 (Faulkner, 1996; Johnson, 1989). Nursing is still under parental responsibility for asthmatic sufferers and this has become increasingly complicated with inhalers and inhaling devices and with the appearance of a variety of medicines with different aims and formats. This makes most asthmatic children and teenagers 'not know' what their treatment is, 'forget about medicines' or 'not know how to take them.' In this sense, Leiria *et al.* (1999) argue that only 29% of asthmatic patients take their medication with them.

To all of this, the ill person's ability to identify symptoms has to be added. Johnson (1989) maintains that the child needs to be sensitive to the signs and symptoms of hypoglycaemia and hyperglycaemia and be aware of the actions to carry out rapidly. But glycaemia crises are easily identifiable, as they are announced by a great number of symptoms. Thus, hypoglycaemia usually appears with shivering, dizziness, perspiration, paleness of the face, hunger, tiredness or heaviness, shudders, convulsions, disorientation, weakness, blurred or double vision, pins and needles in the limbs, earache, tachycardia, gastric discomfort, severe headache or uneasiness.

In the case of hyperglycaemia we would be alerted by perspiration, frequent urination, thirst, dizziness, tiredness, severe headache, dry mouth, nausea, abdominal pain, feeling hot, nervousness, euphoria, irritation or apathy.

In the case of asthma, the child or teenager needs to pay attention to the symptoms which announce a worsening in breathing. However, not all crises have symptoms which announce them and not all patients are able to recognise them. Furthermore, in some cases, asthmatic patients do not detect any stimulus predicting a crisis such as the feeling of itching and irritation in the throat, on the neck or at the top of the back. We have found patients in our sample who were unable to recognize the presence of wheezing, which they associated with their normal state, and even patients who made statements such as "I'm choking in the usual way."

As for the *social response* variable, in the means of the diverse groups one can see significant differences between the *other allergic pathologies* group and the rest of groups, giving lower means than the other two groups which show similar scores. This suggests that the social impact factor is levelled off in asthma and diabetes, which is to be expected if we bear in mind that the common denominators of these two diseases, namely hospitalizations, school absences, limitations and restrictions, are more striking than the characteristics shared with other allergic pathologies.

As regards the *psychological consequences* of the disease, the patients suffering from other allergic diseases have the lowest mean, which significantly differentiates them from the rest of patients. Asthmatic

patients manifest more psychological consequences than diabetic patients, but not in a relevant way.

Padur *et al.* (1995) compared healthy children and others with diabetes, asthma or cancer. They found that asthmatic patients had more affective problems and functional limitations, and scored significantly higher in depression and behavioural problems. Sillanpaa (1987) studied 532 children with a number of chronic diseases, such as epilepsy, asthma, diabetes, brain paralysis, brain dysfunction and coronary disease. He concluded that, in proportion, children with asthma also had more behavioural problems than diabetic children (58% vs 53%). However, asthmatic children had fewer problems than the children suffering from the rest of the diseases.

Although the appearance of these emotional repercussions can actually be accounted for by the chronicity element, it is a fact that some nuances need to be specified, as psychological consequences are also present in other chronic diseases with characteristics similar to those of asthma, whose symptoms are not as spectacular as in this disease. Therefore, we agree with the authors' opinion that asthma brings about behavioural problems to patients depending on the group of reference they are compared with (McQuaid *et al.*, 2001). These characteristics seem to focus not only on physiopathology (on the non visible, of an episodic nature, with a non fatal prognosis and with some implied genetic predisposition) or on daily treatment (on the completion of pharmacological and medical prescriptions, the unfrequent need for hospitalization and the lack of the need for surgical intervention), but also on the psychosocial demands of the ailment or on the significant way the quality of life of the ill person is affected.

We do not coincide with Bussing *et al.*, (1996), who attribute the emotional disfunctions found exclusively to chronicity. These authors studied the presence of emotional problems in asthmatic children and the relationship of these problems with the seriousness of asthma and medical comorbidity. They used the *Child Behaviour Checklist* and applied it to 5-17 year old children who were separated into the following groups: chronic child patients; children without any chronic disease; children with asthma and some other chronic disease associated with asthma, such as ear infections, pneumonia, rhinitis, conjunctivitis or eczema; children with the same chronic disease but not suffering from asthma, and children with asthma only. They determined that the children with asthma and one associated disease had a significant risk to have more emotional and behavioural problems than children without asthma or children without any chronic condition. Asthmatic children actually manifested more academic problems, missed school more often and had behavioural problems likely to be attributed to the chronicity of the disease and not to the very characteristics of asthma itself.

Our study shows that asthmatic patients are the ones with the greatest number of psychological limitations, probably due to the existence of some element other than chronicity that, added to it, may be relating these patients to more emotional problems. In this sense, we need to allude to the unpredictable character (the patient doesn't know when he is going to suffer an attack) intermittent (but knows he is going to have one), variable (the variety of provoking stimuli), the reversibility of the attacks and the characteristic symptomology of the crisis.

In fact, variability and unpredictability are not a problem in the case of diabetes. The easy monitoring of diabetes makes it possible to detect even the slightest glycemic changes and allows for the prediction of possible crises and so the appropriate measures can be taken. This is not replicable in asthma, as the measure of peak expiratory flow is not available to all asthmatic patients, and the PEF, that is, the Peak Expiratory Flow Rate, can change in a matter of seconds if it comes in contact with the allergen. To all of this one has to add the fact that the diabetic person can manage his or her precipitating factors more easily, whereas the asthmatic patient finds it more difficult to control triggers such as mites, fungi, or the pollen coming through the classroom window. In this line, Padur *et al.* (1995) attributed the results of their studies to the overprotection exercised by parents in fear of the unpredictable character of asthmatic episodes. Emotions such as anxiety, anger or frustration can arise as a result of the unpredictable and uncertain nature of asthmatic episodes. Vázquez and Buceta (1994) also warn that the anxiety resulting from an attack can trigger chronic physiological activation, which contributes to the appearance of further acute episodes.

An aspect that could contribute to clarifying the differences is the typical symptomatology of the asthmatic patient. Even though diabetes can provoke serious long term complications such as blindness, kidney disease or arterosclerotic cardiovascular disease, this possible fact is not clearly assumed by the diabetic patient, who feels danger as a very far away perception. Actual danger is more closely perceived by the asthmatic patient, who clearly feels lack of air, breathing difficulties and the threat of death, which provokes feelings of distress, anxiety and frustration. Apart from this, there are many performance restrictions suffered by asthmatic patients due to the symptomatology. The asthmatic child or teenager is aware of his or her inability to carry out the same activities as their peers. This brings about feelings of frustration or sensing that they are different from other people.

The difference between asthma and diabetes can also lie in the wide-range of diabetes education available for the diabetic person. The training puts special emphasis on the need to carry out treatment and control metabolism appropriately. There are research studies which have found these factors to be associated with emotional equilibrium. Thus, Delamater (1992) reviews a number of studies and argues that diabetic children's emotional coping is associated with worse psychosocial adjustment, bad adherence to medication and worse metabolic control. Fonagy, Moran and Higgitt (1989) review a series of research studies carried out with diabetic children and concluded that poor diabetic control is associated with emotional, psychopathological and family problems. Likewise, Johnson (1985) states that the patients with poor metabolic control experience more interpersonal conflicts than those with a good control of it. Puerto, Vaz, Rayo and Moreno (1994) studied the relationship between some psychological variables and metabolic control in 28 children with diabetes *mellitus* and found that the worse the metabolic control the more emotional problems, e. g., anxiety and depression.

As regards the *adverse effects* variable, the asthmatic group has the greatest number and the group with *other allergic pathologies* has the lowest, being significantly different to each other. These findings are in the same line as those by Forero *et al.* (1996), who concluded

that asthmatic children and teenagers reported more somatic complaints, such as vertigo and sleeping disorders than non asthmatic patients. The research by Wjst *et al.* (1996) concluded that asthmatic children had more sleeping disorders, that is to say, they sleep fewer hours than hyperactive or healthy children. The fact that asthmatic patients are the ones recognizing the largest number of secondary effects can be due to the wide spectrum of adverse consequences brought about by the medication, namely heart rhythm disorders, insomnia, nervousness, excitation, headaches, nausea, loss of appetite, weight increase or ulcers. Other reasons for the same secondary effects are the typical physical repercussions of asthmatic exacerbations, such as sleep alterations, tiredness or pain in the chest.

Patients suffering from other allergic pathologies are the ones who significantly report the smallest number of *family consequences*. The diabetes and asthma groups have similar scores.

Other studies carried out with chronic patients reveal the repercussions on the family of the disease (Majani *et al.*, 2005). Northam, Anderson, Adler, Werther and Warne (1996) discussed the association between diabetes and moderate rates of motherly distress, especially in school children, and found social disruption in diabetic children's parents. Faulkner (1996) assessed parents and siblings of children with diabetes. He used a semi-structured interview about the family consequences of diabetes, their implication in the diabetic person's care and their family responsibilities. He determined that, according to the parents, the effects of diabetes on the family were mainly remembering the moment when it was diagnosed, changing the diet, being submitted to a daily activity schedule, resorting to disease coping strategies, coping with insulin reactions and controlling diabetes. The siblings did not identify any family consequence on a large scale, although the most reported answer was the need to be alert to the possible signs shown by the affected brother or sister.

The research study by Lavigne and Ryan (1979) also finds that the siblings of children with chronic diseases do not show significant differences in relation to aggression or learning problems. However, Tritt and Esses (1988) report an increase of behavioural problems in the siblings of chronic patients in comparison with the siblings of the children in the control group.

Although in general terms we can state that having a child with a physical handicap is a source of stress for the family (Kazak, 1989), we can actually establish a series of differences to assess family consequences on the basis of the disease suffered from by the child. Once again it needs to be highlighted that those diseases with common characteristics, such as asthma and diabetes, share similar limitations. Bussing and Burket (1993) studied intra-family anxiety and stress rates in children with asthma, hemophilia, hemophilia with HIV and healthy children. They found that the asthmatic child family showed higher rates of intra-family stress.

We join the view by Goldberg and Simmons (1988) in emphasizing that taking care of both asthma and diabetes requires the parents' performance of a series of tasks. The diabetic child's family has to inject the insulin and so obtain the adequate blood levels of glucose; they also need to select the diet and may come across disagreeable situations of hypoglycaemic crises. The asthmatic child's family needs to provide the pre-

ventive medication and cope with emergency situations in which the child may not respond to the treatment,

As for changes in the family's environment, there are also similar patterns. The asthmatic patient's family needs to stop smoking or having pets at home. The diabetic patient's family needs to adapt to a diet. One more common denominator is the dependence and overprotection generated by both diseases. The parents of asthmatic and diabetic children, aware of the complications deriving from the illness, behave with overprotection and concern, and find it difficult to leave their child with anybody, as they do not dare to leave the nursing responsibilities in the hands of anyone else, this therefore has a bearing on the parents' personal and social lives.

In regards the *social consequences* area (the consequences of the disease in the social and/or occupational life of the child and/or their family), we find that the asthmatic group significantly differs from the rest of the groups obtaining a much higher means. Consistent with our results, we would like to draw attention to the study by Gutstadt *et al.* (1989), which reports that there is more school absenteeism in asthmatic children than in healthy children and in those suffering from any other disease. Sillanpaa (1987) assessed 532 children with a number of chronic diseases, namely epilepsy, asthma, diabetes, brain paralysis, brain disfunction and coronary disease. He determined that asthmatic children, followed by those with diabetes, were the ones who less participated in playful family activities. However, diabetic children, followed by asthmatics, were the ones who most participated in out of home leisure activities.

Richards (1994) concluded that children with rhinitis can also have school problems as parents and teachers usually attribute the nasal symptoms to a possible infection and that antihistamines can bring about sleepiness and irritability, and so interfere with academic performance. However, it is worth stating that if the diagnosis and treatment have been carried out correctly and communicated to the patient and his or her family, the family and the patient can now perfectly distinguish the allergic symptoms of other infection driven symptoms. Furthermore, irritability and sleepiness has been minimized in the latest generation antihistamines, so they hardly provoke these adverse effects.

There are studies which do not determine any social and/or school repercussions in asthmatic patients. As a matter of fact, Sillanpaa (1987) analyzed 532 children with a number of chronic diseases such as epilepsy, asthma, diabetes, brain paralysis, brain disfunction and coronary disease, and concluded that 95% of asthmatic children did not have any problem with social integration.

An argument justifying the data produced by our study is the research conducted by Holden *et al.* (1997). These authors concluded that, even though the physiology, the daily treatment and the psycho-social demands of these three groups of diseases, especially diabetes and asthma, share some similar characteristics, the fact is that the consequences associated to each of them are different. In this respect, we find that the *awareness of the disease* factor plays a key role in this issue.

We remain with the hopeful study by Goldberg and Simmons (1988), which states that in spite of the high number of school and behaviour problems, the fact

is that most children with a chronic disease attain normal social and intellectual development.

In conclusion, we can emphasize that asthmatic patients show more problems than those suffering from the rest of the diseases studied in the areas related to *precipitating behaviours, psychological consequences, adverse effects* and *social consequences*. In the areas related to *adherence to treatment, health habits, precipitating emotions, self-management behaviours, social response and family consequences*, they highest scores are shown by patients with diabetes and with other allergic pathologies. However, the difference with the asthma group is only relevant in the case of *precipitating emotions* and *self-management behaviours*. Consequently, the presence of psychological factors such as *adherence to treatment, health habits, social response, adverse effects* and *family consequences* seems to be more conditioned by chronicity, being equally present in groups of chronic patients with similar characteristics.

These findings have great practical use in the health care area, as they permit us to learn about the risk factors of a variety of patients in relation to the areas being assessed and so we are able to take the appropriate measures. These facts should make it possible to design and put into effect, from primary health care or paediatric attention, workshops or working groups attending to the groups of patients with the most difficulties in the areas under study, bearing in mind, for example, the role played by emotions as triggers in diabetic children or the limitations in the social life of children with asthma.

Finally, one should point to the possible limitations of this study, which should be solved in future research. Among others, we should control the kind of support and care provided to each one of the participants by their families, the possible interactions between some personality profiles in each one of the illnesses studied, and the validity of the instrument applied to a child and juvenile population with diabetes and other allergic pathologies.

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