

# Psychological Factors in Childhood Asthma

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**Summary.** Objectives: The aim of this study is to evaluate psychological aspects of childhood asthma and the connections between the illness and behavioral disturbances in asthmatic children. Study design: We selected a group of 47 asthmatic children and a control group of 47 healthy children. The only criterion for inclusion was that the children be between 4 and 10 years of age; criteria for exclusion were neurological pathologies, cognitive retardation, and serious or chronic systemic disease. The collaboration of a psychologist and a comparative examination of questionnaires used in medical literature helped us prepare a calibrated questionnaire for our study. Results: In our study, the asthmatic children show significantly more behavioral and psychological disturbances than the children in the control group. Conclusions: Within the group of asthmatic children the boys and the children whose illness has lasted less than 4 years, are at greater risk of such disturbances; stressful situations connected to the birth or previous pregnancies can be seen more often in the group of asthmatic children than in the control group; before the onset of the illness the asthmatic children had significant sleep disturbances. **Pediatr Pulmonol.** 2008; 43:366–370. © 2008 Wiley-Liss, Inc.

**Key words:** psychological factors; asthma; childhood.

## BACKGROUND

Asthma is one of the most common chronic illnesses in children and recent years<sup>1</sup> have seen a marked increase in its incidence. A combination of environmental and genetic factors are considered contributory causes.

Historically, psychological aspects have also been considered determining factors. Indeed, asthma has been included in lists of psychosomatic illnesses.<sup>2,3</sup> Psychological factors related to chronic illness have sometimes been considered as factors *favoring* the illness<sup>4</sup> and at other times as a *consequence* of the illness.<sup>5</sup>

The link between childhood asthma and psychological illnesses has often been analyzed. Interest, however, has focused mainly on major psychological disturbances and on evaluating the links between this and the seriousness of the illness. Meuret et al. indicate a significantly larger incidence of asthma in children who are in medical care for psychological disturbances such as anxiety and depression or problems related to poor self-esteem.<sup>6</sup> According to McQuaid et al., these symptoms are not associated with a more serious illness; the severity of illness leads mainly to psychosocial problems.<sup>7</sup> On the other hand there are few, if any, studies of the relationship between childhood asthma and other distressed factors such as in eating habits, sleep patterns, distressed mood, or general behavioral problems. Furthermore, the length or duration of the illness is not taken into account as a factor influencing the development of psychological symptoms. Psychological distress in the mother during the post-natal period is considered, but distress during the pregnancy or in previous pregnancies is not considered. Evaluation of

these factors requires a different questionnaire from those used so far.<sup>8</sup>

## AIM OF THE STUDY

The aim of this study is to evaluate psychological and behavioral aspects of childhood asthma and their connection with the illness. The role of negative experiences during pregnancy and birthing is also considered.

## MATERIALS AND METHODS

### Sample Group

From April to July 2005, we selected a group of 47 asthmatic children and a control group of 47 healthy children. The only criterion for inclusion was that the children be between 4 and 10 years of age; criteria for

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exclusion were neurological pathologies, cognitive retardation, and serious or chronic systemic disease.

The asthmatic children were selected from patients of the Centre for Respiratory Diseases at the Paediatric Clinic of the Policlinico Umberto I in Rome (Italy). The asthmatic children were 30 boys and 17 girls aged 4–10 years (average age 7 and 3/12 years). The age of onset of asthma in these children was between the ages of 1 month and 7 years (average age 1 and 8/12 years). Of these 47 children, 27 were positive on the skin tests. Thirty-nine children had intermittent asthma, four seasonal asthma, and four persistent mild asthma.

The control group consisted of healthy children selected from the Paediatric Clinic during routine health-check visits. Of these 47 children, 26 were boys and 21 girls, aged between 4 and 3/12 years and 10 years (average age 6 and 6/12 years).

### Questionnaire

The collaboration of a psychologist and a comparative examination of questionnaires used in medical literature<sup>9–11</sup> helped us prepare a suitable and reliable questionnaire for our study. The questionnaire was compiled using questions carefully worded to investigate aspects of children’s behavior such as sleep patterns, eating patterns, and aspects of behavior that it is generally considered may be negatively influenced by psychological distress. We also included questions about the pregnancy and about previous pregnancies. This is because we believe the mothers’ life experience could be a significant factor.

The questionnaire, apart from an initial section exclusively for the group of asthmatic children, consists of 26 questions (see Fig. 1). The questions are grouped by subject and divided into six main sections: expectations, real difficulties, sleep disturbances, eating disturbances, behavior and limitations. Criteria for evaluation were as follows:

- *Expectations*: questions 1–3. At least two positive answers to indicate the pathology.
- *Real difficulties*: questions 4–6. At least two positive answers to indicate the pathology.
- *Sleep disturbances*: questions 7–11. At least three positive answers to indicate the pathology.
- *Eating disturbances*: questions 12–16. At least three positive answers to indicate the pathology.
- *Behavior*: questions 17–24. At least five positive answers to indicate the pathology.
- *Limitations*: questions 25–26. At least one positive answer to indicate the pathology.

A pilot study was run to make the questions as clear as possible and to evaluate the time required to fill in the questionnaire.

At the end of the routine health visit, the questionnaire was given to the mother of each child included in the study. Collaboration was 100%. All questionnaires were filled in by the same doctor.

#### Data regarding bronchial asthma

1. Family history of atopy
2. Age of onset
3. Frequency of episodes

#### GINA classification (last 12 months)

- intermittent
- mild persistent
- moderate persistent
- seriously persistent

4. Allergy tests:                      positive                      negative  
positive for

#### Questions for the parent (mother)

##### Expectations :

1. Had you ever had a miscarriage or abortion before the birth of this child?
2. Was it a difficult pregnancy?
3. Was it a planned pregnancy?

##### Real Problems:

4. Were there any problems during the birth?
5. Has your child ever been hospitalized?
6. Has your child ever had a “difficult” experience such as convulsions or accident?

##### Sleep disturbances:

7. Does your child currently sleep with his/her parents?
8. Has your child ever had difficulty in falling asleep in the past?
9. At the present time does your child have problems falling asleep?
10. Has your child ever experienced disturbed sleep in the past?
11. At the present time is your child’s sleep disturbed.

##### Eating disturbances:

12. Has your child ever had eating problems?
13. Does your child have eating problems at the present time?
14. Is your child spoon fed?
15. Does your child always eat the same things?

Fig. 1. Questionnaire.

Behavior:

- 16. Do you ever feel that your child is so anxious or worried that s/he is unable to finish his/her projects (homework, game, sport)?
- 17. Do you ever feel that your child has mood swings (melancholy or sadness)?
- 18. Do you ever feel that your child experiences moments of feeling lonely?
- 19. Is your child rebellious, provocatory, or stubborn (at least 1 of the 3)?
- 20. Is your child disobedient and capricious?
- 21. Does your child need a personal support teacher at school?
- 22. Does your child have problems in his/her relationship with school mates or friends outside school?
- 23. Does your child have problems in his/her relationship with the teachers?
- 24. Is your child part of a wild or undisciplined group?

Limitations:

- 25. Does your child prefer playing with Play Station to playing with his/her friends?
- 26. Does your child try dangerous feats against your will?
- 27. Does your child ever have problems paying attention or concentrating?

Fig. 1. (Continued)

Statistical Analysis

The Fisher test was used for statistical analysis.

RESULTS

Comparison Between Asthmatics and the Control Group

In evaluating the results we found differences between the asthmatic and the control group for all aspects except for behavior. The most obvious differences were related to eating habits and sleep (Table 1).

Link Between Asthmatic Disease and Behavior

In evaluating the links between behavioral and psychological unease and asthmatic disease, we considered those children with disturbances in at least three of the sections of the questionnaire to be at high risk. The children were thus divided into two groups:

- Group A (defined as “high risk”): composed of 16 children, 13 boys (average age 6 and 9/12 years).
- Group B (defined as “not at risk”): composed of 31 children, 17 boys and 14 girls (average age 6 and 2/12 years).

We studied the link between those belonging to the “at risk” and those “not at risk” group for the following factors:

- age
- sex
- family history for atopy
- positive results in allergy skin tests
- age of onset of the illness
- length of the illness
- severity of the illness

Table 2 shows the differences between the two groups.

There is no difference between the two groups for any of the parameters examined.

In evaluating the answers to the questionnaires we can distinguish pre-existent situations, not strictly related to the child’s illness because these situations precede the onset of the illness. Indeed, questions 1, 2, 3, 4, 8 and 10 deal with problems not caused by the illness and a positive correlation would indicate situations that could themselves influence the illness.

When analyzing the differences in the answers to these questions 1, 2, 3, 4, 8 and 10 between the asthmatic group and the control group (see Table 3), we find significant differences for questions 1, 4, 8 and 10, no significant differences for questions 2 and 3. This shows that difficult situations during birth, or in previous pregnancies, and difficulties in sleeping habits pre-dating the onset of the illness, are more frequent in children in the asthmatic group than in the control group.

CONCLUSIONS

In our study the asthmatic children show significantly more psychological and behavioral problems than the children in the control group; stressful situations

TABLE 1— Comparison Between Asthmatic Group and Control Group

	Asthmatic group: no. of subjects with pathological and ( ) non-pathological answers	Control group: no. of subjects with pathological and ( ) non-pathological answers	P
Expectations	12 (35)	4 (43)	0.05
Real difficulties	15 (32)	4 (43)	0.01
Sleep disturbances	13 (34)	3 (44)	0.01
Eating disturbances	21 (26)	4 (43)	0.001
Behavior	16 (31)	9 (38)	0.16
Limitations	9 (38)	2 (45)	0.05

**TABLE 2— Comparison Between “at Risk” Group and “not at Risk” Group**

	Group A (at risk)	Group B (not at risk)	P
Age			
<7 years	9	16	1.00
≥7 years	7	15	
Sex			
M	13	17	0.11
F	3	14	
Family history			
+	8	16	1.00
–	8	15	
Allergy skin test			
+	8	19	0.54
–	8	12	
Age of onset			
<24 months	9	18	1.00
≥24 months	7	13	
Length of illness			
<4 years	10	10	0.06
≥4 years	6	21	
Severity of illness			
Intermittent asthma	15	28	1.00
Persistent asthma	1	3	

connected to the birth or previous pregnancies can be seen more often in the group of asthmatic children than in the control group; before the onset of the illness the asthmatic children had significant sleep disturbances.

Medical literature notes links between psychological and behavioral aspects and asthma in children. Various studies show how the illness can lead to psychological problems in children<sup>9,10</sup> and how psychological problems can influence the progression of the illness.<sup>11,12</sup> Of note, Calam et al.<sup>13</sup> in a relative study of about 700 children, all followed from birth, showed a positive link between psychological vulnerability and a premature onset of symptoms. Mrazek et al.<sup>14</sup> confirm this link between psychological problems and the premature onset of the illness.

In a study by Miller et al. in asthmatic children, a correlation was found between emotional responses viewing the movie E.T. (Extra-Terrestrial) and airway reactivity.<sup>15</sup>

**TABLE 3— Differences Between Study Group and Control Group**

Question no.	Study group		Control group		P
	Yes	No	Yes	No	
1	17	30	6	41	0.01
2	13	34	5	42	0.06
3	11	36	4	43	0.08
4	15	32	4	43	0.01
8	15	32	5	42	0.02
10	17	30	7	40	0.03

In our study asthmatic children defined “at risk” (with disturbances in at least three of the six sections of the questionnaire) do not show significant differences compared with asthmatic children “not at risk” for age, sex, family history, allergy skin test responses, age of onset, length, and severity of illness.

The relationship between stressful situations within the family or between the parents and the asthmatic child, have been frequently reported. Klinnert et al.<sup>16</sup> in a relative study of 145 children at risk of asthma, followed from birth, reveal a significant presence of emotional disturbance in the parents during the *post-partum* period (e.g., mother’s depression, father’s absence...) in the group of children who developed asthma. From our data, it emerges that the mothers of asthmatic children have more often had problems during labor or during previous pregnancies than the mothers of children in the control group.

Our study does not, however, show a link between psychological aspects and the severity of the illness. This was demonstrated in the study by Weil et al.<sup>17</sup> which showed that asthmatic children with psychological problems or with emotionally unstable parents have a higher level of hospitalization for asthma.

Finally, our study does not show a link between behavior problems in asthmatic children and a family history of allergic diseases. This link emerged in Calam’s study,<sup>13</sup> which found asthmatic children with no family history of asthma to be less psychologically vulnerable.

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