

Original Article

PSYCHOLOGICAL, SOCIAL AND SCHOOL IMPLICATIONS OF ASTHMA: A COMPARISON OF BELGIAN FRENCH-SPEAKING CHILDREN HAVING ASTHMA WITH HEALTHY CHILDREN

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ABSTRACT

The present study aimed to explore the psychosocial implications of asthma among Belgian French-speaking children. Ninety-nine parents of children having asthma ($M_{age}=11.40$, $SD=2.35$) and 102 parents of children without asthma ($M_{age}=11.25$, $SD=.81$) participated in the study. Parents filled in the Child Behaviour Checklist and a demographic questionnaire. Results showed that children having asthma were assessed by their parents as having more internalizing, social and attention problems and as having less competence in doing activities (e.g., sports, hobbies, jobs) than their healthy peers. Significant differences also appeared between genders for attention problems, anxiety/depression, activities, social and school competences, indicating that boys were more vulnerable to psychological and social difficulties than girls but they had better school competences than girls. Finally, results showed no difference for psychological, social, and school adjustment between children who controlled and partly controlled their asthma. These findings emphasize the importance of screening children who would be at risk for having psychosocial problems and developing multidisciplinary interventions for children with asthma and for their families.

Key words: Asthma, child, psychological functioning

INTRODUCTION

Asthma is a chronic inflammatory disease of the airways. The worldwide prevalence of asthma symptoms varies

between 2.1 and 32.2% among 13-14 years old adolescents and between 4.1 and 32.1% among 6-7 years old children (1) which makes asthma the most common chronic disease in childhood and adolescence (2). Moreover, epidemiological studies have shown that until puberty, asthma symptoms are more frequent in boys than girls by a ratio of 2: 1 (3-4).

Beyond the physical symptoms that this disease causes, asthma has psychological, social, and academic implications. A meta-analysis on the psychological implications of asthma revealed that children with asthma were assessed by their parents as having more behavioural problems (5). These behavioural difficulties were more internalizing (e.g., anxiety, depression, somatic complaints) than externalizing (aggressive and delinquent behaviours). However, children having asthma did not perceive themselves as more depressed and more anxious than their peers who did not have asthma. At a school level, a review of the literature showed that children having a chronic illness did not have worse academic performance but they were more often absent from school (and absent for longer periods) than their healthy peers (6-8). Finally, at a social level, some research suggested that children suffering from chronic illness were more at risk for being socially isolated than their healthy peers (8-10). Nevertheless, Bender and colleagues (11) have shown that children having a chronic illness did not have a poorer social functioning than their healthy peers.

All these results indicate that there are differences in the way that children with asthma cope with their illness. A part of this variability is probably due to methodological issues such as the choice of informants (children, parents, teacher, etc.), the recruitment of participants (inpatients, outpatients, etc.), the assessment of asthma and its severity (categorical or continuous measures), etc. Asthma severity is often considered as a predictor of this variability. Indeed, a recent review (12) revealed that some studies showed a negative relationship between

asthma severity and children's psychosocial adjustment (5) and other did not find any significant results (13). Moreover, a growing number of clinicians, researchers and international guidelines (14) suggest taking into account asthma control. Asthma control is the result of severity of the disease, responsiveness to treatment, and asthma management (15-16). However, studies about associations between asthma control and psychosocial adjustment are still very scarce. We only found some studies showing that children's quality of life was lower in patients with a partly controlled asthma than in patients with a controlled asthma (17-18). In addition, it is also possible that inconsistencies in the psychosocial adjustment of children with asthma are partly explained by individual differences, such as gender, socio-economic status, country of residence, age, etc. (19-20).

To our knowledge, no study has yet investigated psychological, social and school difficulties among Belgian French-speaking children having asthma. Therefore, the main aim of the present study was to explore the psychosocial implications of asthma in a Belgian French-speaking population. We postulated that children with asthma would present more behavioural problems and less social activities than their healthy peers. However, we hypothesized that there would be no difference for school competences. Moreover, we also aimed to examine the predictive value of asthma control on children's psychosocial adjustment. We expected that children with an optimal asthma control would have a better psychological, social, and school adjustment than children with an impaired asthma control.

METHOD

Participants and Procedure

Asthma sample

Participants were recruited in the paediatric outpatients' department of the Mont Godinne University Hospital (Belgium). The sample comprised 99 parents of children having asthma. The present study was approved by the ethics committee of the participating hospital. Consent forms were presented to the children and their parents. Parents filled in a battery of questionnaires in the presence of a researcher in psychology after the physician's routine appointment with the child.

Medical information was provided by a physician with expertise in paediatric pulmonology. He assessed asthma control, according to criteria of the Global Initiative for Asthma (14), which categorized asthma control in three groups: uncontrolled, partly controlled and controlled asthma. In this sample, 54.4% of children have a partly controlled asthma and 45.6% have a controlled asthma. Children have to take an ongoing treatment including anti-inflammatory and reliever medications. Moreover, the physician also assessed the pulmonary function through the forced expiratory volume in one second (FEV₁). In this sample, the FEV₁ varies between 46 and 118 ($M=82.57$, $SD=13.64$).

Control sample

Participants were recruited from different classes within different schools in Brussels and Namur (Belgium). The study was presented to the school directors and their permission to

conduct the survey was obtained. The children and their parents received written information about the study, which emphasized their freedom to decline participation. Parents completed questionnaires at home. The sample comprised 102 parents of children without asthma. Parents were questioned to ensure that children did not have any chronic illness. Three children were excluded from the sample because they present asthma (diagnosis based on parents' report).

Measures

Psychosocial functioning

We assessed children's psychological, social, and school adjustment using the French version of the Child Behaviour Checklist (CBCL (21-22)), a parent report questionnaire comprising 113 items rated on a three-point scale (0=not true; 1=a bit true; 2=true). The CBCL is one of the most commonly used measures of child's psychosocial functioning (23). The scoring involves a global problems score and a global competences score. The global problems score is divided in 2 dimensions (internalization and externalization) and 8 subscales (withdrawal, somatic complaints, anxiety/depression, social behaviours, thought, attention, delinquent behaviours and aggressive behaviours). Internalizing behaviours include withdrawal, somatic complaints, and anxiety/depression. Externalizing problems include delinquent and aggressive behaviours. The higher the score, the more severe the children's problems are. The global competence score is divided in 3 subscales: activities, social, and school competences¹. Higher scores indicate better competences. Studies that have examined the psychometric properties of the French validation of this scale showed a satisfactory test-retest, inter-judge and inter-cultural reliability, as well as predictive validity of the measure (22, 24-26).

Demographic data

Demographic information such as age, gender, marital status, and parents' education were reported in a questionnaire by the caregiver of the child. The educational level of the parents for both groups was assessed by the highest degree they obtained.

RESULTS

Group equivalence for demographic data

Results showed that children's age did not differ between children with asthma ($M_{age}=11.40$, $SD=2.35$) and children without asthma ($M_{age}=11.25$, $SD=.81$). In the asthma sample, respondents were mothers (86.7%), fathers (11.2%), or other caregivers (2%), which did not significantly differ from the control group in which 86.7% of respondents were

¹ The activities scale includes the number of sports, hobbies and jobs that the child does and the parents' assessment of the child's participation (in terms of amount and quality) in sports activities and job performance. The social scale includes the number of friends, the number of organizations that the child frequents and its participation (in terms of amount and quality) in organizations. This scale also includes scores of how well the child gets along with siblings, other children, and parents and how well the child plays and works alone. The school scale includes parents' ratings of academic performance and their report of special class placement, grade repetition, and other academic problems.

mothers, 8.2% were fathers and 5.1% were other caregivers. Results also indicated no significant difference between groups on parents' marital status. In the asthma sample, 75.3% of the parents lived together, 20.6% were divorced or separated, and 4.1% defined themselves as "other". In the control group, 70.7% lived together, 28.3% were divorced or separated, and 1% defined themselves as "other".

In addition, there were significant differences on gender and parents' educational level between the two groups. There were significantly more boys and fewer girls in the asthma group (65.7% of boys) than in the control group (50.5% of boys), which is in line with results of epidemiological studies showing that asthma is more frequent in boys than girls (3-4). More parents of the control group obtained a university degree than parents of the asthma group. More specifically, in the asthma group, the educational level of mothers was divided as follows: 4.2% primary education diploma, 25% general secondary education diploma, 26% technical and vocational secondary education diploma, 35.4% advanced degree, and 9.4% university degree. Among fathers, the educational level was divided as follows: 12.6% primary school diploma, 17.9% general secondary education diploma, 28.4% technical and vocational secondary education diploma, 24.2% advanced degree, and 16.8% university degree. In the control group, the educational level of mothers was divided as follows: 15.3% primary school diploma, 15.3% general secondary education diploma, 8.2% technical and vocational secondary education diploma, 33.7% advanced degree, and 27.6% university degree. Among fathers, the distribution was as follows: 10.4% primary school diploma, 11.5% general secondary education diploma, 17.7% technical and vocational secondary education diploma, 24% advanced degree, and 36.5% university degree. These preliminary analyses required that we control for gender and parental education in all subsequent analyses.

Psychosocial functioning of children

We conducted two multivariate analyses of covariance (ANCOVA) with the group (asthma and control) as fixed factor and gender and parents' educational level as covariates. The dependent variables of the first multivariate ANCOVA were the main dimensions of the CBCL: internalizing problems, externalizing problems, and total competences. For the second multivariate ANCOVA, the dependent variables were all the subscales of the CBCL.

Effects of group

Results of the first ANCOVA revealed a main effect of group for internalizing problems, indicating that children with asthma ($M=59.93$, $SD=10.69$) were assessed by their parents as having significantly more internalizing problems than their healthy peers ($M=52.96$, $SD=10.82$). Results of the second ANCOVA confirmed these results, showing that children with asthma had more withdrawal symptoms ($M=58.06$, $SD=8.01$ vs $M=55.01$, $SD=6.76$), somatic complaints ($M=61.67$, $SD=9.28$ vs $M=55.78$, $SD=6.44$), and anxiety/depression ($M=59.58$, $SD=8.88$ vs $M=55.83$, $SD=8.61$) than the control group. We also found a main effect of group for social problems, attention problems, and activities competences. These results indicated that children with asthma are assessed by their parents as having significantly more social

($M=57.14$, $SD=9.10$ vs $M=53.78$, $SD=6.81$) and attention problems ($M=58.54$, $SD=8.23$ vs $M=55.25$, $SD=7.02$) and as having significantly less competences in their activities ($M=41.95$, $SD=7.22$ vs $M=45.79$, $SD=7.41$) than children without asthma. No other difference between groups was significant.

Effects of covariates

Results of the first ANCOVA showed a main effect of gender for total competences score, indicating that girls ($M=43.78$, $SD=7.09$) were assessed by their parents as having more total competences than boys ($M=40.25$, $SD=7.99$). These results were confirmed by the second ANCOVA that revealed a main effect of gender for the activities competences, and social competences, indicating that according to their parents, girls had more competences in their activities ($M=46.54$, $SD=6.79$ vs $M=41.94$, $SD=7.49$) and in their social life ($M=43.28$, $SD=7.83$ vs $M=39.75$, $SD=8.46$) than boys. However, the main effect of group for school competences indicated that according to the parents boys ($M=47.16$, $SD=7.82$) had more school competences than girls ($M=44.72$, $SD=7.39$). We also found a main effect of gender for anxiety/depression and attention problems, indicating that girls were assessed by their parents as having significantly lower anxiety/depression ($M=55.81$, $SD=8.20$ vs $M=59.08$, $SD=9.20$) and lower attention problems ($M=55.03$, $SD=6.72$ vs $M=58.25$, $SD=8.28$) than boys. Finally, results showed a main effect of the father's educational level for aggressive problems and a main effect of the mother's educational level for activities competences and school competences. These results indicated a negative association between father's educational level and child's aggressive behaviours and a positive association between mother's educational level and child's school and activities competences.

Asthma control and psychosocial adjustment

Results of different *t*-tests revealed no difference between children with an optimal asthma control and children with a partial asthma control for internalizing and externalizing problems as well as for social and school competences.

DISCUSSION

The present study aimed to explore the psychosocial implications of asthma among Belgian French-speaking children. The findings indicated that children having asthma are more at risk for some psychological and social difficulties than their healthy peers. These results are important for any practitioner implicated in the treatment of children having asthma (paediatricians, pulmonologists, general practitioners, psychologists, psychiatrists, etc.) in order to prevent the development of psychosocial difficulties and to screen children who would be at risk for developing these problems.

As we pointed out earlier, children with asthma were assessed by their parents as having more internalizing problems (anxiety/depression, somatic complaints, and withdrawal) than their healthy peers. These results converge with the findings of a meta-analysis about behavioural difficulties in paediatric asthma (5). However, in our sample, the mean scores of these scales were in the normal (< 60) or in the

borderline clinical (between 60 and 63) range for both groups (27). These results underline that even if children with asthma have more internalizing symptoms than their healthy peers, not all children with asthma have a clinical level of internalizing problems. In a clinical perspective, these findings emphasize that not all children having asthma would benefit from a psychological treatment but underscore the importance for practitioners to be aware of both the physical and the psychological health of children having asthma because internalizing symptoms constitute an important indicator of children's well-being. Furthermore, internalization has also been shown to predict psychological problems later in life, including anxiety, depression, personality disorders, behavioural problems, weight problems, and drug abuse (28-33). If the practitioner suspects excessive somatic complaints, anxious or depressive behaviours in children with asthma, it is highly important to deeply investigate these psychological issues with the child and his parents, and eventually suggest a psychological intervention. Regarding externalizing problems, we found no significant difference between children with and without asthma. Even if these results do not concur with the previous meta-analysis, showing that children with asthma were described by their parents as having more externalizing problems than their peers without asthma (5), our findings are in line with those that find no association between asthma and externalizing problems (34).

Regarding competences scores, we found no difference between groups for school competences, which is consistent with a review showing that children having chronic illness do not have worse school performance than their healthy peers (6). The results also revealed no difference between the two groups for social competences, while children with asthma were assessed by their parents as having more social problems than their healthy peers. These findings reflect the inconsistent results of the literature, showing sometimes that children having a chronic illness do not have poorer social functioning than their healthy peers (8) and sometimes that children with asthma can be more at risk for social difficulties (8-10). Finally, we found that children with asthma had lower scores on activities competences scale than their healthy peers. These findings are in line with those that have shown that children with asthma have a lower level of physical activity than their peers (35). However, these results were not fully supported by empirical research (36), probably partly due to methodological differences between studies such as the assessment of the activities (frequency, intensity, etc.), demographic characteristics of participants, etc.

Moreover, beyond the impact of asthma, an impact of gender on anxiety/depression, attention problems, activities and social competences has been demonstrated. These differences support the idea that boys with asthma are particularly vulnerable to difficulties in their psychological and social functioning. These results could reflect real differences between boys and girls but it could also be that parents expected more from boys than from girls or underestimated the symptoms of girls (37). However, boys were assessed by their parents as having better school competences than girls. Nevertheless, this result must be considered with caution because of the small effect size (Cohen's *d* were lower than 0.40) (38) and because both boys and girls have school competences scores in the normal range (mean scores > 40) (27).

Therefore, even if this difference is statistically significant, it can be considered as minor.

In addition, our findings revealed no significant relationship between asthma control and psychological, social and school difficulties. These results do not concur with other research showing a positive association between both (17-18). However, we used a paediatrician's measure of asthma control, while the previous studies used a self-reported measure of asthma control. Therefore, further research should be conducted using different informants to analyse if the choice of respondents could explain the difference in the association between asthma control and psychosocial adjustment.

Finally, some limitations of this research must be acknowledged. First, we measured all variables through parents' reports. However, studies have shown that there are differences in the assessments parents make of their children and the assessments children make of themselves. Indeed, in previous research children with asthma have been found to report as many internalizing symptoms as children without asthma, while parents have been found to assess children with asthma as having more internalizing problems than children without asthma (5, 39). Moreover, in past research, objective indicators of asthma have been found to correlate more highly with self-report of depressive symptoms than with an observer assessment of depression made by parents or practitioners (40). Therefore, future research should use multiple sources of informants. In addition, parents of children having asthma completed the CBCL during a clinic visit, while parents of the control group completed the questionnaire at home. Even if all the parents had the opportunity to contact the researcher for questions, this difference in data collection could lead to some bias.

Second, it must be noticed that even if there were significant differences between children with and without asthma on internalizing, social and attention problems, the mean scores of these scales were in the normal (< 60) or in the borderline clinical (between 60 and 63) range for both groups (27). Therefore, future research could try to replicate our results with children in the clinical range.

Third, somatic complaints are a part of internalizing problems. Therefore, it could be that internalizing problems were overestimated among children having asthma because children with chronic illness suffer from more physical problems than their healthy peers. However, the scores for the two other subscales of internalizing problems (anxiety/depression and withdrawal) were also significantly higher in children with asthma than in their peers without asthma, though these subscales did not contain items concerning physical problems.

Fourth, our study explored the relationships between asthma and psychosocial adjustment. Because of the transactional nature of the design, we cannot draw any conclusion regarding the direction of the relationship. Three directions are conceivable. First, it could be that children with asthma and their caregivers experience stress, because of the risk and the experience of asthma attacks but also because of daily demands of managing asthma (eviction of triggers, adherence to treatment, etc.) (41) and that stress leads to psychological, social and academic problems. Second, it could be that psychological and social problems increase asthma symptoms (e.g., depressive symptoms activate disease activity) (42).

Third, it is possible that the same factors have an impact on asthma and on psychological, social and academic difficulties, such as the socio-economic status. Longitudinal studies are necessary to test causal relationships between asthma and indicators of physical and psychological health.

In conclusion, to our knowledge, this study presents the first rigorous findings about psychological, social and school difficulties among Belgian French-speaking children having asthma. The results highlight the fact that there is some degree of variability in the psychosocial adjustment of children and open the way for future studies about potential environmental, psychological or family moderators and mediators that could have an impact on the relationship between asthma and psychosocial adjustment. Finally, these findings emphasize the importance of screening children who would be at risk for psychological and social problems and of developing multidisciplinary programmes in the prevention and the treatment of these problems in children with asthma.

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