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THE ASSOCIATION BETWEEN ASTHMA CONTROL AND QUALITY OF LIFE IN CHILDREN IN NORTH BIHAR

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Abstract

Aim: To assess the quality of life of asthmatic patients besides their level of disease control.

Methods: A cross-sectional study was conducted in the Department of Pediatrics, Darbhanga, Medical College and Hospital Laheraisarai, Darbhanga, Bihar, India . Total 120 children aged below 12 years, with physician diagnosed asthma, who have no positive history of any other chronic medical conditions were included in this study. Three questionnaires were used: asthma control test, the strengths and difficulties questionnaire, and the pediatrics asthma quality of life questionnaire.

Results: Only 16.67% of the sample had controlled asthma while 83.33% of them had poorly controlled asthma. The status of asthma control was better among children of educated parents, employed mothers, and those having high family income (P value < 0.05). Significantly poorer quality of life was observed in children with uncontrolled asthma (p<0.001).Children with controlled and uncontrolled asthma were equally affected psychosocially with no relation between asthma control and their psychosocial well-being (p=0.62).

Conclusion: The quality of life for the asthmatic children is strongly correlated with the level of asthma control and severity.

Keywords: asthma, quality of life, children

Introduction

Asthma is a diverse disease characterized by chronic airway inflammation. It is known by history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation.[1] This disease can spontaneously remit or improve with treatment.[2] It is considered a very common disease in children and adolescents.[3] It becomes a widespread health problem that affects not only high income countries; but also, all countries regardless the level of development, on the other hand, most asthma-related deaths occur in low- and lower-middle income countries.[4] The burden of asthma to governments, healthcare systems, families, and patients is increasing worldwide.[5] It is common in India, and probably under diagnosed and undertreated, particularly among children from less wealthy families.[6] Asthma is considered to have a negative impact on the daily life activity of children. Asthmatic children, especially those suffering from poor disease control, show lower activity than normal children.[7] Asthma puts a serious burden on the child's health-related quality of life (HRQOL), despite the availability of effective and safe treatment.[8] Quality of Life (QOL) is a concept widely used to refer to the subjective wellbeing of individuals. This term is used to refer to individuals' subjective satisfaction with important aspects of their life as their physical and mental well-being, social relationships and individual activities.[9] The Pediatric Asthma Quality of Life Questionnaire (PAQLQ) is one of the most widely used instruments for measuring health-related QoL in children with asthma. The standardised version of PAQLQ contains 23 questions in three domains, i.e., activity limitation, symptoms and emotional function.[10] How bronchial asthma affects the quality of life has been the focus of many published types of research. There was a study which had been done in Nigeria concluded that around a quarter of the children attending asthma clinic were psychologically affected beside the interference of asthma with the daily activities.[11]There fore, this study is aiming to assess the level of asthma control and its association to the quality of life of children with asthma

Material and Methods

A cross-sectional study was conducted in the Department of Pediatrics, Darbhanga, Medical College and Hospital Laheraisarai, Darbhanga, Bihar, India.

Methodology

Total 120 children aged below 12 years, with physician diagnosed asthma, who have no positive history of any other chronic medical conditions, were included in this study. A validated Hindi version of the asthma control test (ACT) was used. This tool assesses general asthma symptoms and the frequency of shortness of breath, use of inhalers, and asthma influence on the child's functional

status. It categorizes the children as having controlled asthma (score more than 19) or poorly controlled asthma (score that equals 19 or less).[12-14]This was reported by both of the child and his\her caregiver. A validated Hindi version of PAQLQ was used. This tool measures the functional problems (physical, emotional, and social) that are most troublesome to children as a result of their asthma. It is a self-reported questionnaire that has 23 items rated on a 7-point Likert scale from 1 (not at all) to 7 (always). Higher scores indicate better quality of life.[15-17] This was reported by the child. A validated Hindi version of Strengths and Difficulties Questionnaire (SDQ) was used. It is a frequently used instrument for screening psychopathology in children and adolescents. It is a valid instrument that assesses the presence of psychosocial problems through the following domains (emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behavior). It is comprised of 25 questions and the answers are not true, somewhat true, and certainly true. Answers were scored, respectively, in a range from 0 to 2.[18-20] this was reported by the caregiver of the child.

Statistical Analysis

Data were summarized using frequencies and percentages for categorical variables or means with standard deviation (SD) for measured variables. For the univariate analysis, variables were dichotomized based on the adequacy of asthma control into well-controlled asthma and poorly controlled asthma. Differences between continuous data were analyzed using the independent t-test, and the Chi-square or Fisher's exact tests were used to assess categorical variables as applicable. A P value ≤ 0.05 was considered significant. Statistical analysis was performed with IBM SPSS Statistical software package version 19.

Results

There were 130 eligible patients. 10 of them refused to participate and there were no withdrawals during data collection. The study comprised 120 children with asthma, including 90 young children (6- 10 years of age) and 30 young Children (10-12 years of age). 70 % of the sample had positive family history of asthma. Demographic characteristics and social variables of the patients and their parents are given in Table 1. Only 16.67% of the sample had controlled asthma while 83.33% of them had poorly controlled asthma. The status of asthma control was better among children of educated parents, employed mothers, and those having high family income (P value<0.05). In addition, asthma duration was directly related to the adequacy of asthma control, i.e., the longer the child had asthma, the less severe it was (Table 1).

Table 1: Socio-demographic profile of patients

Variables	**Controlled=20**	**Uncontrolled=100**	**Pvalue**
Age	12.0±2.577	11.375±2.578	0.278
Gender			
Male	12 (60%)	65(65%)	0.781
Female	12 (40%)	35(65%)	
Positive family history	13 (65%)	79 (79%)	0.299
Married	20(100%)	94 (94%)	0.199
Father's education			
Up to 10^{th}	0 (0%)	0 (0%)	0.54
Up to 12^{th}	1 (5%)	16 (16%)	
Graduation	16 (80%)	72 (72%)	
Post graduation	3 (15%)	12 (12%)	
Mother's education			
Up to 10^{th}	0 (0%)	10 (10%)	0.37
Up to 12^{th}	3 (15%)	42 (42%)	
Graduation	14 (70%)	34(34%)	
Post graduation	3(15%)	14(14%)	
Employed mother	12 (70.6%)	33 (40.7%)	
Family income			
Low	4(20%)	35 (35%)	0.00
Average	14 (70%)	50 (50%)	
High	2 (10%)	15 (15%)	
Smoking exposure at home	4 (20%)	70 (70%)	0.015
Asthma duration	Mean:74.59±36.319	Mean:47.88±31.377	0.00

The Quality of Life as Assessed by PAQLQ. Significantly poorer quality of life was observed in children with uncontrolled asthma (p=<0.001) and all domains (activity, symptoms, and emotional function) were equally affected. Tables 2& 3 provide more details.

Psychosocial Well-Being as Assessed by SDQ. Children with controlled and uncontrolled asthma were equally affected psychosocially with no relation between asthma control and their psychosocial well-being (p = 0.62). Also, none of the SDQ domains (the emotional, conduct, hyperactivity, peer, and prosocial problems) showed any relation with asthma control status. (Tables 2&3)

Table 2: The scores of pediatric asthma quality of life questionnaire and the strengths and difficulties questionnaire in relation to asthma control status

Variables	**Controlled** n=20	**Uncontrolled** 100	p-value
PAQLQ*	6.120±0.897	Mean4.339	<0.001
SDQ† (total difficulties score)	13.245±4.241	Mean13.124±4.398	0.62

*PAQLQ: pediatric asthma quality of life questionnaire.
†SDQ: strengths and difficulties questionnaire.

Table 3: Sub analysis of pediatric asthma quality of life questionnaire domains and the strengths and difficulties questionnaire scales in relation to asthma control status

	Controlled	**Uncontrolled**	P value
PAQLQ*domains:			
Activity	8.245±1.242	6.358±1.364	0.001
Symptoms	6.154±1.127	4.325±1.295	0.001
Emotional function	6.238±1.042	4.478±1.139	0.001
SDQ†scales			
Emotional problems	3.489±1.852	4.005±2.325	0.278
Conduct problems	2.610±1.875	2.684±1.752	0.897
Hyperactivity	3.698±2.157	3.988±2.182	0.711
Peer problems	Mean3.357±1.174	3.244±1.389	0.771
Pro-social	Mean8.387±1.826	7.512±2.524	.122

*PAQLQ: pediatric asthma quality of life questionnaire.
†SDQ: strengths and difficulties questionnaire

Discussion

Three relevant findings emerged from this study. First, asthma control status among children was surprisingly low considering that those patients were approached during a follow-up appointment. Second, the quality of life of asthmatic children was significantly lower among those with poorly controlled asthma. Lastly, there was no association between asthma control and the presence of psychosocial problems among the sample.

The percentage of controlled asthma varies across the world. In this study, the percentage of children with controlled asthma was 16.67%, which is similar to many studies worldwide, including a study done in Canada that used Canadian Pediatric Asthma Consensus Guidelines to assess asthma control among children visiting respiratory and allergy clinics, in addition to the emergency department, in which only 11% were controlled.[21] Another study done in Ta'if, Saudi Arabia, reported a percentage of 12%. Children were assessed using ACT and were recruited from pediatric outpatient clinic of Ta'if Hospital and six primary healthcare centers.[22] This small number of controlled asthmatics could be explained by the observation that the two clinics in the current study were subspecialized in pulmonology and most patients presenting to these clinics are usually referred from the general pediatric clinics due to difficulty in controlling their asthma. On the other hand, many other studies showed contrary results, including two studies done in Riyadh: one reported that 41% of the children had controlled asthma, while the other one revealed that the majority of Saudi adolescents were considered mild asthmatics.[23,24] However, this difference might be because, in our study, the sample was recruited from the subspecialty clinic where those with severe asthma are seen. Meanwhile, those considered mild asthmatics (probably more controlled) are seen by general practitioners, general pediatricians, and family physicians. Poor quality of life is significantly related to impaired

asthma control, as implied by the PAQLQ scores in our study. Many other studies conducted in Iran, Unites States, and Saudi Arabia have shown similar results.[22,25-27]

In addition, all the three domains of the PAQLQ (activity, symptoms, and emotional function) were found to be equally affected. The study that was held in Ta'if showed similar findings except that the activity limitations domain was found to be the most affected domain.[22] Similarly, the study done in Iran reported that males had more disturbance in the quality of life than females, mainly in the activity domain.[25]

This study showed that there was no significant difference in the psychosocial well-being on both controlled and uncontrolled groups. This goes against what Hysing et al.[28] found. In their study, the SDQ reported an increased rate of emotional and behavioral problems in children with chronic illnesses including asthma. Furthermore, the presence of psychological problems among asthmatic patients has been shown to be linked to the level of disease control.[29]

Our findings could be explained by the small number of controlled asthmatic children. Moreover, it is suggested that asthma as a chronic illness could be influencing the behavioral health of the children regardless of their control status. A study done by Tibosch et al.30 found that well controlled asthma does not necessarily rule out major psychosocial problems. Parents' educational level and family income were positively related to asthma control status. Finkelstein J. a. et al.[31] found that children of parents with low educational levels are associated with medication underuse. Also, other studies in the United Kingdom and Germany have discovered that severe asthma is correlated with decreasing socioeconomic status.[32,33] Among the plausible explanations for these findings is the point that highly educated parents are more aware of the benefits of controlling their children's asthma in addition to an easier access to healthcare facilities and medications. Moreover, it was noticed that children of employed mothers have better control of asthma; this could be because of the direct relationship between mothers' employment status and their educational level, in addition to their ability to afford the needed medications. This finding contradicts the result of a study done in the United States which reported that maternal employment increases the likelihood for children to develop an asthma episode by 12% compared to those who are unemployed.[34] Also, 61.7% of the patients with poorly controlled asthma had history of smoking exposure in their homes. This could play a role in the status of asthma control within our sample and illustrates the importance of conducting a study that focuses on factors affecting asthma control.

Conclusion

The quality of life for the asthmatic children is strongly correlated with the level of asthma control and severity.

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