ORIGINAL RESEARCH

Quality Of life In Children with Bronchial Asthma

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ABSTRACT
Aim: To evaluate the quality of life in children with bronchial asthma.**Material & Methods:** This was a cross sectional hospital based study conducted in the Department of Paediatrics, Mahatma Gandhi Medical College and Hospital, Jaipur among 100 patients of Bronchial asthma with age group of Children in the age group of 2-18 years between March 2021 to July 2022. Grades of severity of asthma at initial diagnosis were categorized into intermittent, mild persistent, moderate persistent and severe persistent on the basis of day time and night time symptoms. The PAQLQ (S) has been developed to measure the functional (physical, emotional, occupational and social) problems that are most troublesome to children of 2-18 years with asthma. Data was collected and subjected to statistical analysis. **Results**: Maximum subjects were having moderate asthma (57%). The mean PAQLQ score was least in normal BMI subjects i.e., 3.87±0.70, followed by underweight subjects (4.03±0.71) and maximum was in 4.23±0.79. The mean PAQLQ score in subjects with mild asthma was 3.86±0.73, in moderate asthma subjects it was 4.12±0.65 and in patients with severe asthma it was 4.43±0.74. According to Pearson correlation analysis, there was a statistically significant positive correlation between duration of asthma and PAQLQ score (r= 0.42, p<0.01).**Conclusion**: The severity of the individuals' asthma and their BMI have an impact on their quality of life, thus appropriate steps should be done to reduce their BMI and to treat their asthma. The PAQLQ score and the duration of asthma have a positive statistically significant correlation, which leads to the conclusion that the quality of life of subjects is negatively impacted as the duration of asthma increases. As a result, steps should be taken to treat the disease effectively and promptly.
Keywords: Asthma, QoL, PAQLQ

INTRODUCTION

Bronchial asthma is defined as a heterogeneous, chronic, complex, inflammatory disease of the respiratory system. It causes recurrent wheezes, chest tightness, dyspnea, and cough[1,2].It was estimated that asthma affected about 7% of adults residing in the USA, and the prevalence is greater between children (about 10%). The Center of Disease Control (CDC) reported that the overall prevalence of lifetime asthma is 10.5%[2]. According to published literature, the prevalence of bronchial asthma in children ranged from 2% to 23% in India.[3]

According to the global initiative for asthma (GINA) guidelines, rating of asthma control is defined on the basis symptoms control mainly. However, the treatment of childhood asthma must be targeted in multi-domains includes symptomatic control, induction of long-term disease-free state and feeling of emotional wellbeing[4].

The World Health Organization Quality of Life Group defines QoL as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns"[5]. Therefore, for a complete picture of patient health status, conventional clinical indices and health-related QoL (HRQoL) must be assessed[6].

The disease, along its course, evokes varying emotions in children; the negative ones prevailing. Emotional disorders are experienced by 25–40% of asthmatic children; most often consisting of excessive psychological dependence on the parents and increased anxiety level[7]. Parents often tend to act incorrectly in such situations. They are overprotective, assume rigid attitudes, and get too much involved in

other family members' lives. Overprotection impedes the child's emotional development, disturbs the development of self-reliance and independence. Excessive family concentration on the affected child leads to the lack of independence, egocentrism, and infantilism. The child starts to exert pressure on the family, whereas, when separated from the family, he is not self-confident and new situations trigger anxiety reactions[7,8].

Reducing everyday duties and permanent supervision of the child result in difficulties in adoption to living in the society[9-11]. The child's chronic disease also may disturb the learning process. Difficulties at school may result from several factors, such as the medicines taken, the absenteeism due to disease exacerbation or hospitalizations. Oral glucocorticosteroids may disturb the cognitive processes or cause sleep disturbances, plaintiveness, anxiety, or depression. Beta2-adrenergic agonists, in turn, may cause muscles trembling and may be the reason for illegible handwriting. Sleepiness, decreased concentration, and fatigue are just some of the other side effects resulting from antihistaminic medicines[12].

There is an assumption that poor QOL scores are observed in children with very severe asthma than children with mild asthma. However existing literature had revealed that QOL is not related to asthma control and is a separate entity determining overall asthma health status[13-16]. In India, there is a scarcity of data on risk factors for pediatric asthma, QOL and the severity of asthma in newly diagnosed children and their caregivers, warranting the need for an evaluation of QOL[17].So this study was initiated to know the quality of life in children suffering from asthma, their problems and areas in which they lag behind their colleagues.

MATERIAL &METHODS
This was a cross sectional hospital based study conducted in the Department of Paediatrics, Mahatma Gandhi Medical College and Hospital, Jaipur among 100 patients of Bronchial asthma with age group of Children in the age group of 2-18 years between March 2021 to July 2022.

INCLUSION CRITERIA
Children in the age group of 2-18 years, newly or previously diagnosed with bronchial asthma.

EXCLUSION CRITERIA
- Patients and guardian who did not give consent for the study,
- Children with other co-existing chronic diseases,
- Developmental retardation.

METHODOLOGY
- The current study was a cross-sectional hospital based study
- Diagnosis and assessment of severity of bronchial asthma in the current study was done as per

"GLOBAL INITIATIVE FOR ASTHMA (GINA)" guidelines.

Grades of severity of asthma at initial diagnosis were categorized into intermittent, mild persistent, moderate persistent and severe persistent on the basis of day time and night time symptoms and SABA reliever needed those who were already on treatment were categorized into controlled, partly controlled and uncontrolled as per day time symptoms, limitations of activities and nocturnal symptoms.

- The PAQLQ(S) has been developed to measure the functional (physical, emotional, occupational and social) problems that are most troublesome to children of 2-18 years with asthma. PAQLQ(S) has 28 questions in four domains (symptoms, treatment, worry and communications). Children will be asked to recall their experiences during the previous week and to respond to each question on a 4-point scale (0 = no impairment, 4= severe impairment). Hence, a high score mean poor 'Health related quality of life'(HRQL). Individual questions will be equally weighted. The overall PAQLQ score will be calculated as the mean of the responses to each of the 28 questions. The resultant overall score was between 0-4. The individual domains will be analyzed in exactly the same way. Two types of questionnaires will be used - self administered and interviewer administered. Children of age ≤ 10 year will be given interviewer administered questionnaire and children of age > 10 years will be provided self administered questionnaire. Individual variables evaluated will include clinical and socio-demographic characteristics. Association between mean PAQLQ(S) scores and individual variables will be evaluated.
- A record of clinical profile was made using predesigned Proforma after obtaining consent.

Data was collected and subjected to statistical analysis using SPSS version 24.

STATISTICAL ANALYSIS
Data so collected was tabulated in an excel sheet, under the guidance of statistician. The means and standard deviations of the measurements per group were used for statistical analysis (SPSS 22.00 for windows; SPSS inc, Chicago, USA). For each assessment point, data were statistically analyzed using one way ANOVA. Difference between two groups was determined using t test and the level of significance was set at $p < 0.05$.

RESULTS
Of the total 100 subjects included in the study, majority of the patients were in age group 7-12 (68%) years, followed by 21 subjects in age range 13-18 years and only 11 subjects were in age group 2-6 years.Maximum subjects were males i.e., 71% and remaining 29 patients were females. In present study,

maximum subjects were from urban area (63%) and remaining 37% patients were from rural area. 63 subjects had positive family history of asthma/allergy (Table 1). The mean duration of asthma of study subjects was from 2.78±1.92 years.

Table 1: Demographic characteristics among the study subjects

Age Group (in years)	N	%
2-6	11	11
7-12	68	68
13-18	21	21
Gender		
Male	71	71
Female	29	29
BMI		
Underweight	11	11
Normal	65	65
Overweight	24	24
Residence		
Rural	37	37
Urban	63	63
Family History		
Yes	63	63
No	37	37
Total	100	100

Maximum subjects in present study were having moderate asthma (57%), 38 subjects had mild asthma and 5 subjects had severe asthma. (graph 1)

Graph 1: Severity of asthma among the study subjects
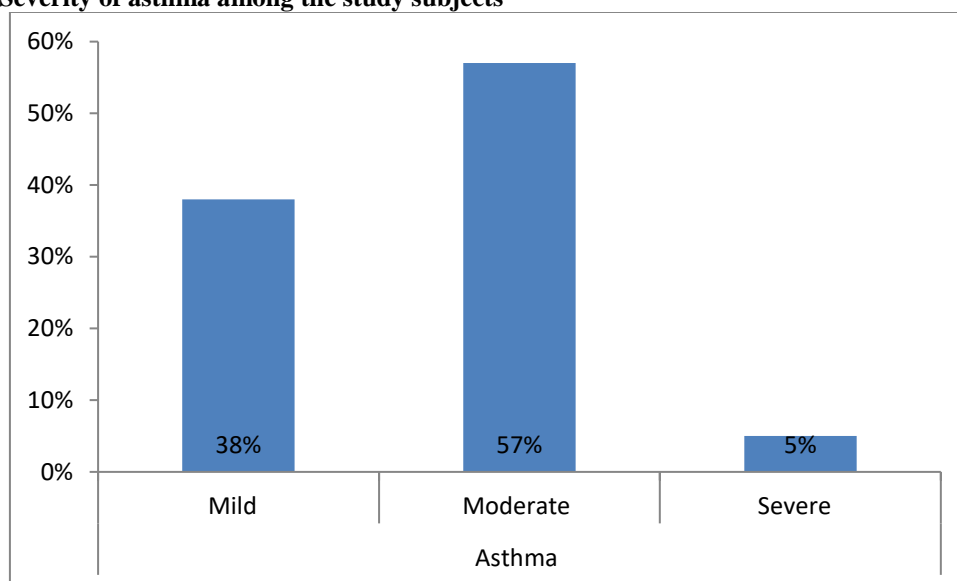
The mean Symptoms Score was 4.04±0.47, Activities Limitations Score was 4.28±0.62, Emotions Score was 4.05±0.56 and mean PAQLQ Score was 4.13±0.73. Descriptive analysis of PAQLQ (S) score 6 months before study during covid period, the mean Symptoms Score was 4.02±0.46, Activities Limitations Score was 4.03±0.55, Emotions Score was 4.30±0.64 and mean PAQLQ Score was 4.11±0.71 as shown in table 2.

Table 2: Descriptive analysis of PAQLQ (S), before 6 months of study during covid periodamong the study subjects

Variables	Mean	SD	Mean (Before COVID period)	SD
Symptoms Score	4.04	0.47	4.02	0.46
Activities Limitations Score	4.28	0.62	4.03	0.55
Emotions Score	4.05	0.56	4.30	0.64
PAQLQ Score	4.13	0.73	4.11	0.71

The mean PAQLQ score in male subjects was 4.19±0.78 and in female subjects was 4.10±0.62 with statistically insignificant difference. The mean PAQLQ score in subjects aged 2-6 years was

833

4.02±0.76, in patients of age group 7-12 years was 4.11±0.72 and in 13-18 years of subjects it was 4.24±0.67. There was no significant difference in mean PAQLQ score when compared with age group of subjects. The mean PAQLQ score was least in normal BMI subjects i.e., 3.87±0.70, followed by underweight subjects (4.03±0.71) and maximum was in 4.23±0.79.

When the mean PAQLQ score was compared with BMI of study subjects, it had a statistically significant difference (p=0.042). The mean PAQLQ score in urban area subjects was 4.02±0.82 and in subjects with rural area was 4.24±0.73. There was no statistically significant difference in mean PAQLQ score according to residence of subjects as shown in table 3.

Table 3: Comparison of PAQLQ according to gender, age, BMI and residence

Gender	Mean PAQLQ	SD
Male	4.19	0.78
Female	4.10	0.62
t test	0.71	
p value	0.44	
Age Group (in years)		
2-6	4.02	0.76
7-12	4.11	0.72
13-18	4.24	0.67
Anova test	0.83	
p value	0.36	
BMI		
Underweight	4.03	0.71
Normal	3.87	0.70
Overweight	4.23	0.79
Anova test	3.06	
p value	0.042*	
Residence		
Rural	4.24	0.73
Urban	4.02	0.82
t test	2.75	
p value	0.09	

*: statistically significant

The mean PAQLQ score in subjects with mild asthma was 3.86±0.73, in moderate asthma subjects it was 4.12±0.65 and in patients with severe asthma it was 4.43±0.74. This shows that there was a statistically significant difference in mean PAQLQ score when compared with severity of asthma (p=0.007) as shown in Table 4. According to Pearson correlation analysis, there was a statistically significant positive correlation between duration of asthma and PAQLQ score (r= 0.42, p<0.01).

Table 4: Comparison of PAQLQ according to severity of asthma

Asthma	Mean PAQLQ	SD
Mild	3.86	0.73
Moderate	4.12	0.65
Severe	4.43	0.74
Anova test	3.84	
p value	0.007*	

*: statistically significant

DISCUSSION
The main findings of the present study are as follows:

In the present study, of the total 100 subjects, majority of the patients were in age group 7-12 (68%) years, followed by 21 subjects in age range 13-18 years and only 11 subjects were in age group 2-6 years.In study done by Wander A et al., (2017)[17] maximum children were in the age group of 7 to 12 years (n= 67, 74.4%) followed by 13 to 17 years (n= 23, 25.6%). According to Savdahiya D et al., (2021)[18] mean age (years) of subjects was 10.94±1.9.Singh M et al., (2004)[19]found that mean age of study subjects was 0.5 ± 2.3 years.Al-Gewely MS et al., (2013)[20] found that the

studied patients were 77 (55%) males and 63 (45%) females.

In present study, maximum subjects were males i.e., 71% and remaining 29 patients were females. The male to female ratio was 2.45:1. Similar male dominance was revealed by Wander A et al., (2017)[17], Savdahiya D et al., (2021)[18], Singh M et al., (2004)[19]and Al-Gewely MS et al., (2013)[20].

In present study, according to are of residence maximum subjects were from urban area (63%) and remaining 37% patients were from rural area. In study done by Savdahiya D et al., (2021)[18] 71% subjects were from Urban area and 29% of patients belonged to rural area. According to study done by Al-Gewely MS

et al., (2013)[20] 122 (87.1%) patients were living in an urban area, while only 18 (12.9%) patients were living in a rural area. These findings are in accordance to the present study.

According to severity of asthma, maximum subjects in present study were having moderate asthma (57%), 38 subjects had mild asthma and 5 subjects had severe asthma. In study done by Savdahiya D et al., (2021)[18] when subjects were graded according to severity of asthma, then 42 subjects had mild asthma, 54 have moderate and Severe asthma was reported by 4 subjects. Ali R et al., (2020)[21]found that intermittent asthma was found in 12.69% of patients, mild asthma in 29.85%, and moderate asthma was present in 57.46% of subjects.

In present study, the mean Symptoms Score was 4.04±0.47, Activities Limitations Score was 4.28±0.62, Emotions Score was 4.05±0.56 and mean PAQLQ Score was 4.13±0.73. In study done by Savdahiya D et al., (2021)[18] the mean PAQLQ score was 4.18±0.61, mean symptoms score was 4.02±0.67, mean activities limitations score was 4.3±0.88 and mean emotions score was 4.09±0.88.According to study done by Al-Gewely MS et al.,(2013)[20] the overall PAQLQ score ranged between 2.2 and 6.6 with a mean ± SD of 4.1 ± 1, the score of activity limitation ranged between 1.6 and 6 with a mean ± SD of 3.9 ± 0.8, score of emotional function ranged between 2 and 7 with a mean ± SD of 4.8 ±1.2 and the least score was that of symptoms ranged between 1.6 and 7 with a mean ± SD of 3.6 ± 1.3.

In present study, descriptive analysis of PAQLQ (S) showed that when subjects were in lockdown during covid time in their homes, the mean PAQLQ Score was low, suggesting that due to less pollution and less exposure to dust, the mean PAQLQ Score reduced in asthma subjects, which suggest that surrounding environment plays a very important role in life of asthma subjects.

The mean PAQLQ score in male subjects was 4.19±0.78 and in female subjects was 4.10±0.62. Although the mean PAQLQ score in male patients was more than in female subjects, but that difference was not statistically significant. In study done by Savdahiya D et al., (2021)[22] PAQLQ score was higher in males than females but was statistically nonsignificant.In study done by Trzcieniecka-Green A et al, (2009)[12] the differences in QL between girls and boys suffering from bronchial asthma were statistically irrelevant.But Kouzegaran S et al., (2018)[73] observed that Pediatric QL scores were significantly better in the girls.

The mean PAQLQ score was least in normal BMI subjects i.e., 3.87±0.70, followed by underweight subjects (4.03±0.71) and maximum was in 4.23±0.79. When the mean PAQLQ score was compared with BMI of study subjects, it had a statistically significant difference (p=0.042).According to study done by Van Gent R et al., (2007)[23] and Lavoie KL et al., (2006)[24] demonstrated lower QoL scores among asthmatic

adolescents and adults, respectively with increased BMI. But in study done by Al-Gewely MS et al, (2013)[20] they did not find a significant effect of increased BMI on QoL scores.

The mean PAQLQ score in urban area subjects was less (4.02±0.82) when compared with patients of rural area (4.24±0.73). But there was no statistically significant difference in mean PAQLQ score according to residence of subjects. These findings suggest that mean PAQLQ score in urban area subjects was less in asthmatic patients in rural inhabitants because of the difficulties to reach medical health care services, while urban children can probably attend medical facilities more easily and thus receive better care of their asthma.In study done by Al-Gewely MS et al., (2013)[20] the residence of the patients did not significantly affect QoL scores (p>0.05).But according to Trzcieniecka-Green A et al., (2009)[12] there was a significant relation between the place of living and quality of life of asthmatic children. It was found that children living in the country assessed their quality of life better than those from the city. A better assessment of quality of life among country children may result from a few factors, such as a slower pace of life, less pressure of time, and therefore less associated stress. Children living in the country spend more time with their parents who give them more support. They may also be supported by their grandparents, who live in common households much more often than in case of cities. Another reason for a feeling of a better quality of life in these children may be less polluted natural environment in the country, which in case of asthma directly translates to the frequency of respiratory symptoms.

The mean PAQLQ score in subjects with mild asthma was lowest (3.86±0.73), followed by subjects with moderate asthma (4.12±0.65) and in patients with severe asthma it was highest (4.43±0.74). This shows that there was a statistically significant difference in mean PAQLQ score when compared with severity of asthma (p=0.007). This suggest that proper care should be provided to asthmatic children so that severity of disease should not progress, which inversely affects the quality of their life.

LIMITATIONS

The main shortcoming of the current study was the lack of evaluation of the treatment's impact on children with asthmatic QOL. Secondly, the parents' and caregiver's QOL perspectives were not evaluated either. Thirdly, it was a single centre study with a rather short follow-up. Therefore, additional multicenter studies that take into account the viewpoint of care givers as well as the post-treatment effect on PAQLQ score and are followed for an extended period of time are needed.

CONCLUSION

From the present study it was concluded that majority of paediatric subjects suffering from asthma were

males within age group of 7-12 years and had normal BMI, residing in urban area with moderate asthma symptoms and majority had positive family history of asthma/allergy. This demonstrates that people with a family history of asthma and those who live in metropolitan areas are more exposed to pollution. The average PAQLQ score of the individuals, according to the research's findings, was not substantially correlated with their gender, age, or place of residence, but there was statistically significant difference when compared with BMI (p=0.042) and severity of asthma (p=0.007) of subjects. The severity of the individuals' asthma and their BMI have an impact on their quality of life, thus appropriate steps should be done to reduce their BMI and to treat their asthma. The PAQLQ score and the duration of asthma have a positive statistically significant correlation, which leads to the conclusion that the quality of life of subjects is negatively impacted as the duration of asthma increases. As a result, steps should be taken to treat the disease effectively and promptly, and children should receive counselling to improve their emotional and social lives so they can interact with their peers more effectively and actively engage in all activities without hesitation.

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