

Original Research Article

Assessment of quality of life in asthma patients in 5 to 18 years of children

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ABSTRACT

Background: Asthma is a common cause of morbidity and mortality with prevalence of 300 million in world. The QOL of asthmatic patients cannot be determined only on the basis of the severity of the disease, but requires a measurement of personal perception. This study was conducted with the aim to assess and compare the QOL using PedsQL scale in asthma patients between 5 to 18 years of age with different demographic and clinical variables.

Methods: This was a cross-sectional observational study conducted at respiratory clinic in tertiary hospital, Rewa from October 2017 to June 2019. A total number of 150 asthmatic patients and their parents participated. Asthmatic patients (N=150) and their parents, presenting to asthma clinic of Gandhi Memorial Hospital, Rewa (after applying inclusion-exclusion criteria) were assessed for QOL using PedsQL scale 3.0. Statistical analysis was performed by SPSS version 20. Test of significance by student T-test and one way ANOVA.

Results: The QOL is severely hampered by asthma with mean of 59 in intermittent asthma, 51 in mild, 44.74 in moderate and 40 in severe persistent asthma, significant p value of <0.05. Younger age, level of asthma control and severity were significantly related to QOL with p value of <0.05. Sex, socioeconomic status, were insignificantly related.

Conclusions: QOL is impaired as the grading of asthma increases. Impairment of Quality of life are mostly associated with low level of asthma control, poly-therapy and frequent night attacks.

Keywords: Paediatric asthma, Patient and parent related outcome, QOL

INTRODUCTION

Asthma is a common cause of morbidity and mortality with prevalence of 448 per lakh in Madhya Pradesh in 2016.¹ Bronchial asthma is a heterogeneous chronic inflammatory disease, characterized by recurrent episodes of wheezing, dyspnoea, chest tightness, and cough.² In the global burden of asthma report of the GINA, the prevalence of asthma in different countries has been considered to range from 1% to 18% of the population.²

The quality of life of asthmatic patients cannot be determined only on the basis of the severity of the disease, but also requires a measurement of personal

perception such as the impact on everyday-life due to the illness, emotional functioning and the quality of life related to health.³

In recent years, as the focus has shifted from survival to the quality of life, HRQOL has emerged as an important outcome measure in pediatrics.⁴ HRQOL instrument must be multidimensional, consisting at the minimum of the physical, mental, and social health dimensions delineated by the World Health Organization.⁵ Most of the studies regarding QOL are done in developed countries and there is paucity of data about quality of life among patients living in developing countries.

The present study aims to find the effect of asthma on the quality of life in children and to determine various risk factors like physical, psychological and demographics associated with quality of life.

METHODS

This study was conducted in the Respiratory Clinic of the Department of Paediatrics, Shyam Shah Medical College and Gandhi Memorial Hospital, Rewa, India, after ethical approval and informed consent was taken from parents of all children. The study was conducted over a period of 18 months January 2018 to June 2019.

Inclusion criteria

This study included children of the age group 5 to 18 years undergoing treatment for asthma.

The sample size was decided with the help of the prevalence of disease in Madhya Pradesh and a 95% confidence interval. A structured proforma was filled for every child enrolled in the study.

Exclusion criteria

The study excluded all asthmatic children with chest wall deformity, chronic lung disease, patient with history of pulmonary tuberculosis, recent exacerbation (<1 month) at the time of enrolment, patient with any other chronic disease (like congenital heart disease, diabetes mellitus, systemic hypertension, arthritis), who have answered <50% questionnaire and those whose parent didn't give consent for the study.

Procedure

Baseline characteristics, including social-demographic data, aeroallergen sensitization, severity of asthma, duration of asthma, control over asthma, co-morbidity and patient's medications were recorded for all patients. The pediatrics quality of life (PedsQL) asthma module 3.0 was filled for everyone with help of parents and children.⁶ The scale was translated and administered by the authors themselves in Hindi during visits of patient in Respiratory clinic of the institute. Permission for use of PedsQL tools was taken.

Proforma was used in different age group like, young child and parents report in 5-7 years age group, child and parents report in 8-12 year age group, teen and parents report in 13-18 year age group were filled. PedsQL asthma module 3.0 assess the quality of life on 4 health related problem that are about my asthma (problem with), treatment (problem with), worry (problem with) and communication (problem with) and a total of 28 questions both for children and parents. Each question carries a score from 0 to 4 and were calculated based on child/parent's response. For ease of interpretation, items were reversed scored and linearly transformed to a 0-100,

so higher the score better is quality of life (QOL). Then mean score for each dimension were calculated as the sum of the items over the number of items answered. Finally, the total scale score, the mean is computed as the sum of all the items over the number of items answered on all the scales. We further analysed the QOL in various dimensions of PedsQL inventory and tried to identify the factors affecting individual dimensions of life.

Further, it was analysed for the identification of factors associated with Quality of life like anthropometric measurements, age, sex, residence, socioeconomic status (as per Modified Kuppuswamy scale 2017).⁶ Level of nutrition has been determined in patients using CDC's BMI chart.^{7,8} Diagnosis of asthma was made as per the GINA guideline 2018.⁹ Patient's asthma has been classified into intermittent, mild persistent, moderate persistent and severe persistent asthma.⁹

Level of asthma severity was defined as per GINA guidelines 2018: infrequent episodic/frequent episodic/persistent, level of asthma control based on GINA guideline 2018 as: controlled/partly controlled/uncontrolled, symptoms often appear or worsen at night, walking, viral infection, exercise, laughter, allergen and cold air, number of attack in day time (per week) or in night (per month), drug therapy (monotherapy or polytherapy), duration of illness, episode of status asthmaticus and other comorbidities.⁹

Statistical method

Statistical analysis was done using computer software (SPSS version 20). The qualitative data were expressed in proportions and percentages and the quantitative data expressed as mean and standard deviations. The difference in proportion was analysed by using chi square test and the difference in means were analysed by using student T test (unpaired) and one way ANOVA. Significance level for test was determined at 95%, p value is significant if $p < 0.05$.

RESULTS

The study included 150 asthmatic children of age group 5-18 years; they were evaluated by using PedsQL. The mean age of study group was 9.7 years. Out of 150 children, 61% were male and 39% were female.

The majority of the children (62%) belong to rural area. 38% mother and 15% father have not received any formal education. 44% population belong to lower and upper lower class while only 7% belong to upper class. Baseline characteristics were mentioned in Table 1.

QOL score is poor in patients with symptom worsening at night or walking (Table 2), with symptoms often triggered by exercise, laughter, allergens, cold air (Table 3) and symptoms often appear or worsen with viral infection (Table 4) with a p value < 0.05 .

Table 1: Frequency of different variables.

Variable	Distributions	Frequency (percentage %)
Age	5-7 years	60 (40)
	8-12 years	48 (32)
	13-18 years	42 (28)
Sex	Male	91 (60.7)
	Female	59 (39.3)
Residence	Urban	57 (38)
	Rural	93 (62)
Father's education	Nil to <primary education	23 (15.3)
	Primary education	22 (14.7)
	High school	26 (17.3)
	Higher sececondary	46 (30.7)
	Graduate	27 (18)
	Post Graduate	6 (4)
Mother's education	Nil to <primary education	57 (38)
	Primary education	15 (10)
	High school	35 (23.3)
	Higher secondary	27 (18)
	Graduate	16 (10.7)
Socio economic status	Upper	10 (6.7)
	Upper middle	29 (19.3)
	Lower middle	45 (30)
	Upper lower	31 (20.7)
	Lower	35 (23.3)

Table 2: Distribution of symptom worsening at night or walking.

	Symptom worsening at night or walking n= 120 (80%)	Symptom not worsening at night or walking n=30 (20%)	P value
M±SEM* (child)	44.82 (1.22)	55.17 (2.16)	0.000
M±SEM* (parent)	48.90 (1.07)	56.06 (2.21)	0.004
Total mean score (M±SEM)*	46.99 (1.03)	55.53 (1.852)	0.000

*Mean±Standard error of mean.

QOL score in patient on monotherapy is better than patient on polytherapy with p value of <0.05 (Table 5). Relation between QOL and comorbidity like rhinitis, rhino sinusitis, depression and anxiety, was insignificant p value of 0.535 (Table 6). QOL score decreases with increase in frequency of episodes (Table 7) and number

of episodes of *status asthmaticus* with p value <0.05 (Table 8).

Table 3: Distribution according to symptom triggers.

	Symptoms often triggered by exercise, laughter, allergens, cold air; n=117 (78%)	Symptoms not triggered by exercise, laughter, allergens, cold air; n=33 (22%)	P value
M±SEM* (child)	45.98 (1.26)	50.09 (2.37)	0.128
M±SEM* (parent)	48.61 (1.10)	56.45 (1.92)	0.001
Total mean score (M±SEM)*	47.40 (1.064)	53.30 (1.88)	0.009

*Mean±Standard error of mean.

Table 4: Distribution according to symptoms affected by viral infection.

	Symptoms often appear or worsen with viral infection n=117 (78%)	Symptoms not affected with viral infection n=33 (22%)	P value
M±SEM* (child)	45.26 (1.24)	52.67 (2.28)	0.006
M±SEM* (parent)	48.35 (1.07)	57.39 (1.99)	0.000
Total mean score (M±SEM)*	46.74 (1.036)	55.67 (1.795)	0.000

*Mean ±Standard error of mean.

Table 5: Therapy wise distribution.

	Monotherapy n=113(75%)	Polytherapy N=37(25%)	P value
M±SEM* (child)	57.38(1.77)	43.45(1.20)	0.000
M±SEM* (parent)	59.45(1.66)	47.35(1.06)	0.000
Total mean score (M±SEM)*	53.38(1.46)	45.53(0.99)	0.000

*Mean ±Standard error of mean.

Table 6: Distribution according to comorbidities.

	Nil N=35 (23.3%)	Rhinitis N=55 (36.6%)	Rhino sinusitis N=47 (31.3%)	Depression N=6 (4%)	Anxiety N=7 (4.7%)	P value
M ± SEM* (child)	48.5 (1.99)	48.20 (1.862)	46.81 (2.09)	45.33 (4.33)	44.71 (3.974)	0.770
M ± SEM* (parent)	48.5 (6.43)	47.92 (1.86)	47.61 (1.52)	46.16 (5.00)	45.85 (4.93)	0.861
Total mean score (M±SEM)*	48.50 (3.88)	48.07 (1.70)	47.15 (1.66)	45.73 (4.60)	45.14 (4.53)	0.535

*Mean ±Standard error of mean.

Table 7: Distribution based on frequency of episodes.

	Infrequent episode N=64 (42.6%)	Frequent episode N=52 (34.6%)	Persistent episode N=34 (22.6%)	P value
M±SEM* (child)	53.73 (1.48)	45.35 (1.87)	36.35 (1.58)	0.000
M±SEM* (parent)	56.40 (1.41)	47.59 (1.52)	43.11 (1.69)	0.000
Total mean score (M±SEM)*	55.09 (1.24)	46.79 (1.48)	39.59 (1.42)	0.000

*Mean ± Standard error of mean

Table 8: Distribution according to number of episodes of *status asthmaticus*.

	0 episode N=108 (72%)	1 episode N=33 (22%)	2 or more episodes N=9 (6%)	P value
M±SEM* (child)	49.12 (1.29)	48.42 (2.41)	40.11 (2.796)	0.005
M±SEM* (parent)	51.30 (1.19)	48.20 (1.82)	51.0 (4.44)	0.20
Total mean score (M±SEM)*	50.17 (1.10)	48.36 (2.01)	47 (3.50)	0.037

*Mean ±Standard error of mean.

Table 9: Distribution according to the level of asthma control.

	Controlled N=59 (39.3)	Partially controlled N=57 (38)	Un-controlled N=34 (22.6)	P value
M±SEM* (child)	53.44 (1.56)	46.39 (1.80)	36.35 (1.58)	0.000
M±SEM* (parent)	56.54 (1.35)	48.47 (1.55)	42.70 (1.78)	0.000
Total mean score (M±SEM)*	55 (1.24)	47.74 (1.48)	39.38 (1.46)	0.000

*Mean±Standard error of mean.

Table 10: Distribution according to the grading of asthma.

		Intermittent N=35 (23.3%)	Mild persistent N=40 (26.6%)	Moderate persistent N=39 (26%)	Severe persistent N=36 (24%)	P value
Child report	Chronic M±SEM*	57.89 (1.71)	51.53 (1.97)	41.72 (1.94)	36.64 (1.50)	0.000
	Acute M±SEM*	55.86 (1.86)	50.85 (1.72)	41.87 (2.16)	38.61 (1.80)	0.000
Parent report	Chronic M±SEM*	59.82 (1.70)	51.45 (1.98)	46.82 (1.58)	43.69 (1.64)	0.000
	Acute M±SEM*	57.94 (2.00)	53.40 (1.88)	45.13 (8.22)	42.56 (1.93)	0.000
Total mean score (M ± SEM)*		58.80 (1.43)	51.40 (1.64)	44.74 (1.61)	40.17 (1.379)	0.000

*Mean ±Standard error of mean.

QOL and level of asthma control

QOL in patient with controlled asthma have mean score of 55 while patient with uncontrolled asthma mean of 39.38. There is discrepancy among QOL score of child and parent which is most among uncontrolled group. The level of asthma control is significantly associated with QOL with p value <0.05 (Table 9).

QOL and grading of asthma

Child reports with intermittent asthma have better quality with a total mean score of 58.80, which highest among the group while score deteriorate as the severity increases with mean QOL of 51.40 in mild persistent, which further decrease to 44.74 in moderate persistent and worst among severe persistent with mean of 40.17. The QOL is significantly related to grading of asthma with p value <0.05 (Table 10).

DISCUSSION

Asthma is a very common chronic disease in children and the quality of life of asthmatic patients cannot be determined only on the basis of the severity of the disease alone, but also requires a measurement of personal perception such as the impact on everyday-life due to the illness, emotional functioning and the quality of life related to health.³

The quality of life is affected with age of child and is poor in young patients and improves in adolescents. In El Gendi et al study, they also found result similar to my study.¹⁰ As younger child is not able to express his condition as effective as older child, the quality of life decreases because of communication gap resulting in poor QOL in younger children

In our study the QOL is poorer in male patients, In Abdel Hai et al study similar result was found.¹¹

In our study, it was found that most patient with symptom worsening at night or walking have poor quality of life (46.99) as compared to patients without symptoms worsening at night or walking who have better quality of life (55.53). We have also found that the QOL in patients with symptoms often triggered by exercise, laughter, allergens, cold air have lower QOL score. The patients with symptoms often appear or worsen with viral infection had a poor QOL of 46.74 and patients with symptoms not appear or worsen with viral infection had mean value of 55.67. No such studies that compare these variables have been done as far as our knowledge. Monotherapy with only inhalation SABA had a better QOL when compared to patients on polytherapy (SABA + inh. steroid, SABA + inh. steroid+ oral steroid, others). There are many studies comparing QOL on specific drugs but none to compare on monotherapy with polytherapy.

The quality of life in patients with uncontrolled asthma (mean QOL=39.38) was poorer when compared to those with controlled (mean QOL=55) or partially controlled (47.74). Abdel Hai et al study had similar conclusion with mean QOL of controlled patients and those of patients with uncontrolled asthma had a mean QOL.¹¹ Patient with good control over asthma have less episode of wheezing, resulting in good quality of life. The QOL is better in patient with intermittent asthma as compare to mild, moderate and severe asthma. The results obtained in Pont et al study was comparable to the values obtained in my study while In Ziora et al study, there was no correlation between severity of asthma and quality of life.¹²

Our study has following limitations: (1) There is paucity of data regarding PedsQL in Indian population so cutoff regarding good and bad QOL is not available. (2) Single centre study. (3) Lacks longitudinal follow-up of patients. Despite these limitations our study shows the risk factors which may affect children with QOL especially in 5-7 years of age.

CONCLUSION

From the above study, it can be concluded that asthma affects the quality of life in children across all age. Patient with lesser grading of asthma, good asthma control, infrequent episode of *status asthmaticus*, not having symptom triggering factors and on monotherapy have a better QOL compared to the patient with severe asthma, poor asthma control, frequent episode of *status asthmaticus*, having symptom triggering factors and on polytherapy. We can conclude that every effort should be made to decrease the frequency of attack, and minimize the number of drugs for improving the QOL in this patient cohort.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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