Original Research Article

Economic Burden of Childhood Asthma In A Tertiary Care Setting Of North India

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Abstract

Background: Asthma is one of the most common chronic respiratory diseases with an increasing prevalence worldwide. It has huge economic and social impact. Newer medications and other therapies allow many patients to control their symptoms, but the cost of treatment can be high. In addition, the treatment of acute exacerbation and comorbidities of asthma consume considerable medical resources. **Methodology:** For assessing economic impact of asthma on children and their families we studied 216 children over a period of 1 year at department of pediatrics of Patna Medical College and Hospital. Both direct and indirect cost of asthma was assessed. Direct costs include inpatient care, emergency visits, OPD visits, drugs and devices and diagnostic tests. Indirect costs include school days lost, traveling cost, and productivity loss for the caretaker of asthmatic children. **Results:** Out of total 216 children, 65 % were male and 35% were female. Mean loss of school days because of asthma related events were 3.6 days in preceding 6 months. About 6% children required hospitalization in the preceding 6 months and 54% children had some restriction on their play activities because of asthma. The mean monthly expenditure on the therapy was Rupees 410. **Conclusion:** As a leading chronic childhood illness, asthma has a large socioeconomic burden on affected children and their families.

Keywords: Childhood asthma, economic burden, school absenteeism, direct and indirect cost.

Introduction

Asthma is one of the most common chronic respiratory diseases with an increasing prevalence and financial burden worldwide[1]. During childhood, bronchial asthma is often underdiagnosed and undertreated, which may lead to severe psychosocial disturbances in the family. Asthma is associated with enormous healthcare expenditures that include both direct and indirect cost.

Children with asthma have three times the rate of school absenteeism as compared to their counterpart[2]. Asthma can not only negatively impact quality of life, but often results in hefty medical expenses and potential life-threatening exacerbations. Children with asthma made1.65 times more non-urgent outpatient visits as compared tothe general population of children. Nevertheless, Children with asthma spend 1.71 times more on urgent care visits and had 2.09 times more hospital stay as compared to general population of children. Average investment on child with asthma is 1.88 times morethan the non-asthmatic child[3].

From 1985 to 1994, the estimated total cost of illness for pediatric (patients younger than 17 years) asthma in United States increased from $2.25 billion (in 1994 dollars) to $3.17 billion despite a 15.5% decrease in the cost of care per child[4]. In 2007, the total incremental cost of asthma to society was $56 billion, with direct costs accounting for $50.1 billion, productivity losses attributable to morbidity accounting for $3.8 billion, and productivity losses attributable to mortality accounting for $2.1 billion[5]. In a study in Taiwan by Sun et al[6] it was found that pediatric patients with asthma used substantially more health services than those without asthma. Hospital outpatient visits and overall healthcare expenditure for patients with asthma were 2.2-fold higher than those of patients without asthma. Almost three-fourths of all asthma-related costs were attributable to hospital outpatient visits; one-fourth was attributable to urgent care and hospitalizations.

However, there is paucity of similar studies in India.

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The components of total health care costs for children with asthma have not been well studied and an overall understanding of the health care utilization patterns in this population is lacking. Such an understanding is essential for developing cost-effective strategies for asthma management

Given the changing epidemiology of asthma, prospective assessments are required to assess the economic impact of this disease on the pediatric population. With this background the study was contemplated to determine the economic impact of asthma in pediatric age group.

Material and method

The study was conducted in Dept. of Pediatrics of Patna Medical College Hospital over a period of 12 month. Children with diagnosis of bronchial asthma were included in the study. Children with other concurrent chronic illnesses were excluded from the study. Socio-demographic details alongwith parental education, occupation and per capita income were recorded.

Details and duration of the illnesswere recorded by taking history from parents and child. The details of treatment and medicines used were also assessed. The state of control of symptoms was graded as controlled, partially controlled, and uncontrolled. State of control of symptoms was assessed by enquiring about the number and severity of acute exacerbations and peak expiratory flow rate (PEFR) measurements in preceding 6 months.

Restriction of the activities was noted on parents'judgement. Impact on schooling was assessed by recording the school absenteeism due to asthma in preceding 6 months.

The monthly expenditure on the therapy of the child was recorded along with number of physician visits, emergency department visits and any admission record due to asthma. Hospitalization cost was also evaluated for ever admitted patients. The impact of child's illness on parental occupation was also judged by the number of leaves parents had taken because of child's illness. For statistical inference required frequency was generated and measure of central tendency, mean was also calculated.

Results

Total of 216 children were included in this study. Among this 141 were boys and 75 were girls. Mean age of children enrolled were 8 years (Table 1).

Table 1: Characteristics of Study Population

Total Children	216
Male: female	141:75
Mean age	8 years
Mean monthly per capita income	Rs 8000

The mean age of onset of symptoms was 4.5 years. Table 2 shows the details about the disease severity. 78% of children had either mild or moderate persistent asthma.

Table 2: Distribution of Children according to severity of asthma

Mild intermittent	8%
Mild persistent	46%
Moderate persistent	32%
Severe persistent	14%

Mean loss of school days because of asthma related events were 3.6 days in preceding 6 months. However, in well controlled asthma group it was nil. About 6% children required hospitalization in the preceding 6 months. Near about 18% of the parents reported absence from work for a mean of 2.4 days because of children's asthma in the preceding 6 months. Outpatient physician visit by children for asthma over a period of 6 months were 49%. About 54% children had some restriction on their play activities because of asthma. These restrictions were more commonly seen in children with moderate or severe persistent asthma than with itsmilder counterpart. The mean monthly expenditure on the child's therapy was Rupees 410.

Discussion

Economic evaluation of asthma has been performed in many countries. As the incidence of childhood asthma is increasing, the cost of treatment is also increasing. In this study, we have observed significant impact on childhood activities, schooling and considerable financial burden on the family with child having asthma. Also, the burden mentioned increases with the increase in the severity of asthma.

In coherence with the present study, the Australian study also found an increase in costs with increasing disease severity[7]. In our study 49% children reported an outpatient physician visit because of asthma. In contrast with the result, a Canadian study reported 89% outpatient physician visit for asthma by child over a period of 18-month[8]. Despite the standards of asthma treatment that international guidelines recommend, many patients continue to suffer suboptimal control of symptoms and experience exacerbations. According to U.S. National Center for Health Statistics (NCHS) asthma surveillance report, 69% of children 5-14 years of age reported physician visit over a period of 12 months in the 1993- 1995[9].

The present study used actual time losses reported by parents to estimate indirect costs. Several studies in children assumed that a day of school absenteeism was equivalent to a day of parental workloss[10,11]. Using school absenteeism to represent parental productivity loss may overestimate indirect costs. In this study about 54% children reported some restriction on their play activities because of asthma. Previous studies have also reported adverse effect on ability of child to participate in sports activities. In a study by Donnelly et al 61% of parents of asthmatic children reported restriction of their children in physical activities[12]. In another study by Coughlin et al restriction in sport activities was found in 64% of affected children[13]. However, some studies have also reported little impact of childhood asthma on physical activities[14]. In many cases parents were imposing restrictions even in the absence of acute symptoms, out of apprehension of aggravation of symptoms due to certain activities.

In a systematic review it was found that medications form the largest proportion of the direct costs related to asthma, accounting for 38%–89% of the total cost[15]. Marion et al.[16], Vance and Taylor[17] in their study has also reported profound impact of childhood asthma on the economic well-being of the family which was similar to our study. In conclusion, children with asthma have substantially greater health care cost and utilization than the general population. The rising incidence of pediatric asthma demands that greater attention to be paid to the delivery of optimal care to this segment of the population. Moreover, study of the costs of an illness can provide insight into how healthcare resources addressing a disease are distributed, and can lay the groundwork for further policy decisions so that financial resources toward this disease can be planned more effectively.

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