

Medical Charge of Asthma Care in Admitted Thai Children

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Background: Asthma is one of the most common chronic diseases in children. Due to high admission rate for acute asthmatic attack, children often miss their schools and parents have to stop working to take care of them. These affect both mental and physical health as well as socioeconomic status of the family and the country.

Objectives: To evaluate medical charge of asthma care in children admitted to the Department of Pediatrics, Faculty of Medicine Siriraj Hospital, Mahidol University.

Material and Method: The study was a retrospective and descriptive study. Data were collected from children with asthmatic attack admitted to the Department of Pediatrics, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand from January 1st, 2000 to June 30th, 2003. Cost of room, food, drugs, devices, laboratory study and service charge were recorded. Total medical charges per year, per patient per admission and per patient per day were calculated. Data were analyzed with Chi square test, ANOVA and Post Hoc test. A *p* value of < 0.05 was considered statistical significant.

Results: Numbers of children with asthmatic attack admitted to the Department of Pediatrics, Siriraj Hospital increased between 2000-2002 (113,147 and 176 in 2000, 2001, and 2002). Seventy two percent of the patients were ≤ 5 years of age. Most were mild intermittent asthma. The average duration of hospitalization was 4 days (95% CI, 3.6-4.3). Average medical charge per patient per admission and per day was 3236.20 and 998.60 Bahts respectively. There was no significant difference in the medical charge per patient among the admitted years. Medical charge of admission was significantly associated with the asthma severity. (*p* ≤ 0.05)

Conclusion: The rate of admission from asthmatic attack in children at Siriraj Hospital and the total medical charge per year increased between 2000-2002. Nevertheless, medical charge of asthma admission per person was unchanged. Main expense in medical charge of asthma admission was the cost of medication and room. Severity of asthma was related directly to medical charge.

Keywords: Medical charge of asthma care, Childhood asthma admission

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Asthma is a common and costly health condition. It is a chronic illness characterized by recurrent episodes of airflow obstruction and airway inflammation. Asthma is one of the most common chronic diseases in children. Incidence of asthma increases in many

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countries all over the world. In Thailand the incidence of asthma in children increased from 4.29 %⁽¹⁾ in 1986 to 13 % in 1995⁽²⁾ and 14.5 % in 2001⁽³⁾. In 80 % of asthma among Thai patients, the onset of asthma symptoms starts before the age of 5⁽⁴⁾. Acute asthmatic attack is one of the common causes of hospital admission in children. These children often miss their school and the parents have to stop working to take care of them. These affect both mental and physical health as well as socioeconomic status of the family and the country.

The cost of asthma care includes direct medical cost, direct non-medical cost and indirect cost. The direct medical cost is the medical charge from the hospital. Economic analyses in Massachusetts, USA showed that only 8% of the patients had either a hospital admission or an emergency room visit, but hospital costs among these patients accounted for 25% of the total costs of asthma care.⁽⁵⁾

In Thailand, the government set DRG (drug related groups) for the repayment under global budgeting plan is lower than the true hospital expense. Medical charge of asthma care in admitted patients are important in this new medical system for the inpatient repayment. The objective of this study is to evaluate the medical charge of asthma care in children admitted to the Department of Pediatrics, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand.

Material and Method

The study was a retrospective and descriptive study. Data were collected from children, 0-15 years old, admitted to the Department of Pediatrics, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand due to asthmatic attack between January 1st, 2000 and June 30th, 2003. Cases with wheezing but not due to asthma, asthmatic patients admitted due to other causes and those with other systemic diseases were excluded from the study. Asthma severity was based on the clinical manifestation of the

patient during long term follow up period.⁽⁶⁾

Charge of hospital stay, food, drugs, devices, laboratory study and other service items were recorded. Total medical charge was calculated. Data were analyzed with Chi square test, ANOVA and Post Hoc test (SAS 8.0, SAS Institute, Cary, USA). The medical charge among different severity of asthma and among each year was analyzed. A p value of < 0.05 was considered statistical significant.

Results

There were 511 (307 male and 204 female) asthmatic children admitted due to acute asthmatic attack to the Department of Pediatrics, Siriraj Hospital from January 1st 2000 to June 30th 2003. Numbers of acute asthmatic admission increased between the year 2000-2002 (113, 147, and 176 in the year 2000, 2001, and 2002 respectively). There were 75 asthmatic patients admitted during January 1st and June 30th 2003. Average age of admitted patients was 3.6 years. Seventy two percent of patients were ≤ 5 years of age as shown in Table 1. Most of the patients had mild intermittent asthma. Average range of hospitalization was 4 days (95% CI, 3.6-4.3). The length of admission decreased slightly without statistically difference between years.

Total medical charge for asthma care for children admitted to the Department of Pediatrics, Siriraj Hospital was 435,829.70, 517,983.90, 643,966.40 Bahts in the year 2000, 2001 and 2002 respectively. Total medical charge from January 1st to June 30th 2003 was

Table 1. General characteristics of asthmatic children admitted due to acute asthmatic attack to the Department of Pediatrics, Siriraj Hospital from January 1st 2000 to June 30th 2003

Characteristics / year	2000	2001	2002	2003*
Admission number	113	147	176	75
Sex				
Male	72 (63.7%)	90 (61.2%)	105 (59.7%)	40 (53.3%)
Female	41 (36.3%)	57 (38.8%)	71 (40.3%)	35 (46.7%)
Mean age (years – SD)	3.5 – 2.8	3.5 – 2.8	3.6 – 3.2	3.9 – 3.4
0-2 years	32.7%	38.1%	30.7%	29.3%
> 2-5 years	39.8%	33.3%	42.6%	44.0%
> 5-15 years	27.5%	28.6%	26.7%	26.7%
Severity				
Mild intermittent	68.1%	62.3%	64.2%	64.0%
Mild persistent	23.9%	20.5%	22.2%	25.3%
Moderate persistent	7.1%	15.7%	13.1%	10.7%
Severe persistent	0.9%	1.5%	0.6%	0%
Average admission day (days – SD)	4.3 – 4	4.0 – 3.3	3.8 – 3.3	3.6 – 2.1

* The data collection from January 1st to January 30th 2003

260,340.00 Bahts. Average medical charge per patient per admission was 3236.20 and per day was 998.60 Bahts as shown in Table 2. There was no significant difference in medical charge per patient among the admitted years ($p > 0.6$).

Major expense in medical charge of asthma care in admitted children was due to medications, room and food. In general pediatric ward, major expense was due to medication while in private ward it was due to room and to food cost (Table 3).

Medical charge for patient admitted to private ward was double that for patients admitted to general ward. Cost of room and food in private ward were significantly higher than in general ward ($p < 0.05$). The average medical charge for private and general ward were 7217.30 vs 3701.40, 7520.30 vs 3147.30, 6185.20 vs 3572.10 and 7779.50 vs 3373.90 Bahts in the year 2000, 2221, 2220 and 2003 respectively.

Table 2. Medical charge of asthma care for admitted children per person per admission and per day

Medical charge (Baht)				
Year	charge/ person/ admission		charge / person/ day	
	mean	(min. Max.)	mean	(min max)
2000	3856.90	(605.00 - 19406.50)	966.00	330.40 - 4824.00
2001	3523.70	(512.00 - 16594.30)	985.60	284.20 - 3849.00
2002	3658.90	(570.00 - 29448.90)	1040.50	300.50 - 3947.00
2003	3471.20	(696.00 - 15948.20)	974.80	410.30 - 2658.00
Average	3636.20	(512.00 - 29448.90)	998.60	284.20 - 2658.00

Table 3. Detail of medical charge of asthma care for admitted children per person per admission

Mean charge (Baht –SD)				
Type of care	2000	2001	2002	2003
Room + Food	938.10 – 1008.90	821.00 – 673.30	788.6 – 833.50	728.00 – 423.10
Drug	1917.90 – 667.00	2036.60 – 1792.90	2146.20 – 2487.10	2095.20 – 1895.00
Device	51.20 – 343.60	6.40 – 8.20	70.50 – 498.40	28.80 – 113.40
Laboratory	748.30 – 1113.00	463.30 – 646.60	427.40 – 615.40	406.50 – 440.70
X-ray	136.20 – 444.80	139.40 – 357.00	148.80 – 354.50	177.30 – 503.20
Special investigation	65.00 – 193.00	56.80 – 152.00	77.20 – 244.80	35.30 – 118.40
Service charge	100.00 – 0.00	100.00 – 0.00	100.00 – 0.00	100.00 – 0.00

Table 4. Medical charge of asthma care for admitted children per person per admission stratified by asthma severity

Asthma severity	Mean medical charge (bath/ person/ year) SD	
Mild intermittent	3195.98	2774.70
Mild persistent	3820.75	2674.98
Moderate persistent	5565.60	4148.48
Severe persistent	6838.60	6246.10

The medical charge of asthma care in admitted children was significantly associated with asthma severity ($P \leq 0.05$) as shown in Table 4.

Discussion

Total medical charge per year increased between the year 2000 to 2002 due to the increment of admission of asthmatic children into Department of Pediatrics, Siriraj Hospital. During this period, medical charge of asthma admission per person was unchanged. This stable medical charge in Siriraj Hospital during these years could be due to little change in general medical charge of room, food and medicine which were the main expenses in charge for these admitted children. In a study by Cisternas et al from California, USA, medication comprised 85 % of direct cost and 33 % of total cost. Hospitalization comprised 15 % of direct cost and 9 % of total cost.⁽⁷⁾

Nearly three quarters of the admitted patients were less than 5 years old. This was supported by our previous studies in 1982 and 1992.^(8,9) The average range of hospitalization was 4 days in our study which was slightly different to the duration of 3.5-5.9 days in our previous studies.^(7,10) Our study showed that most of the admitted patients had mild intermittent asthma. Charges of room and food in private ward were significantly higher than in general ward ($p < 0.05$) and the total medical charge was doubled.

Average medical charge per patient per admission was 3236.20 Bahts (about 81 US \$). This amount of medical charge was low compared to other developing countries⁽⁷⁾, but is high when compared to the income per person in Thailand.

Asthma severity based on long term evaluation did not correlate well with rate of admission. Medical charge of asthma care significantly associated with asthma severity ($P \leq 0.05$) due to more medication usage and longer duration of admission. In a study by Gibson medications comprised 47% and 39% of total charges for patients with mild or moderate asthma severity but for those with severe asthma, medications comprised only 19% of total charges (although the absolute magnitude of medication costs was greater).⁽¹⁰⁾ Both direct and indirect costs increased monotonically and dramatically with increases in self-reported severity of disease.⁽¹⁰⁾ Most of the cost burden of asthma is a consequence of both poor control and greater severity, especially for major outcomes, such as hospital admissions.⁽¹⁰⁾ Improvement in asthma control through improved disease management could potentially result in significant savings in patient's

morbidity and costs to society.⁽¹¹⁾

Conclusion

The rate of admission from asthmatic attack in children at Siriraj Hospital and the total medical charge per year increased between 2000 to 2002. Nevertheless medical charge of asthma admission per person during this period was unchanged. Main expense in medical charge of asthma admission was due to cost of medication and room. The higher degree of asthma severity, the higher medical charge was encountered.

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ค่าใช้จ่ายในการให้บริการทางการแพทย์แก่เด็กโรคหอบหืดที่เข้ารับการรักษาแบบผู้ป่วยใน

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โรคหอบหืดเป็นโรคที่พบได้บ่อยในเด็ก และเป็นโรคเรื้อรังที่ต้องใช้ค่าใช้จ่ายที่ค่อนข้างสูง และเป็นหนึ่งในโรคที่ทำให้เด็กต้องเข้ารับการรักษาในโรงพยาบาล ทำให้ต้องขาดเรียน และเป็นภาระแก่ผู้ปกครอง ก่อให้เกิดการสิ้นเปลืองทางเศรษฐกิจ ทั้งยังเป็นผลกระทบต่อสุขภาพกายและสุขภาพจิตด้วย การศึกษาค่าใช้จ่ายในผู้ป่วยที่เข้ารับการรักษาในโรงพยาบาลด้วยโรคหอบหืด ยังมีน้อยมาก

วัตถุประสงค์: เพื่อประเมินค่าใช้จ่ายในการให้บริการทางการแพทย์แก่เด็กโรคหอบหืดที่เข้ารับการรักษาแบบผู้ป่วยในที่รับไว้ในภาควิชากุมารเวชศาสตร์ คณะแพทยศาสตร์ศิริราชพยาบาล ในช่วงเวลาตั้งแต่ 1 มกราคม พ.ศ. 2543 ถึง 30 มิถุนายน พ.ศ. 2546

วัสดุและวิธีการ: การศึกษานี้เป็นการศึกษาแบบ descriptive study ที่ได้รวบรวมข้อมูลของผู้ป่วยเด็กอายุ 0-15 ปี ที่เข้ารับรักษาแบบผู้ป่วยใน ในภาควิชากุมารเวชศาสตร์ คณะแพทยศาสตร์ศิริราชพยาบาลด้วยโรคหืด เฉียบพลัน ตั้งแต่ 1 มกราคม พ.ศ. 2543 ถึง 30 มิถุนายน พ.ศ. 2546 โดยคิดเป็นค่าใช้จ่ายในการให้บริการทางการแพทย์จาก ค่าห้อง ค่าอาหาร ค่ายา ค่ารักษาพยาบาล ค่าเวชภัณฑ์ ค่าตรวจทางห้องปฏิบัติการ ค่าตรวจทางรังสี ค่าตรวจพิเศษอื่นๆ และค่าบริการทางการแพทย์ โดยเปรียบเทียบค่าใช้จ่ายในการให้บริการทางการแพทย์เฉลี่ย ต่อคนในแต่ละปีต่อคนต่อครั้ง และต่อคนต่อวัน รวมทั้งค่าใช้จ่ายในการให้บริการทางการแพทย์ของผู้ป่วยที่มีความรุนแรงของโรคหอบหืดที่แตกต่างกันออกไป การวิเคราะห์ข้อมูลใช้โปรแกรม SPSS วิเคราะห์ทางสถิติ โดยใช้ Chi square test, ANOVA, Post Hoc Test ตามความเหมาะสมของข้อมูล, ความแตกต่างของค่าอย่างมีนัยสำคัญ ทางสถิติเมื่อค่า $p < 0.05$

ผลการศึกษา: ผู้ป่วยเด็กที่เป็นโรคหืดที่เข้ารับการรักษาในภาควิชากุมารเวชศาสตร์ คณะแพทยศาสตร์ศิริราชพยาบาล คิดเป็นจำนวน 113, 147 และ 176 ครั้ง ในปี พ.ศ. 2543, พ.ศ. 2544 และ พ.ศ. 2545 ตามลำดับ จำนวนวันเฉลี่ยที่อยู่ในโรงพยาบาลคือ 4 วัน (95 CI, 3.6 - 4.3) ผู้ป่วยร้อยละ 72 มีอายุน้อยกว่า 5 ปี และผู้ป่วยส่วนใหญ่จัดอยู่ในกลุ่ม mild intermittent asthma ค่าใช้จ่ายในการให้บริการทางการแพทย์ของผู้ป่วยโรคหืดที่เข้ารับรักษาในโรงพยาบาล มีค่าเฉลี่ย 3,636.20 บาท ต่อครั้ง และ 998.60 บาทต่อวัน ค่าใช้จ่ายส่วนใหญ่เป็นค่ายา โดยที่ค่าใช้จ่ายแต่ละปี ไม่มี ความแตกต่างทางสถิติ และพบว่าผู้ป่วยที่มีความรุนแรงของโรคสูงกว่าจะมีค่าใช้จ่ายในการให้บริการ ทางแพทย์สูงกว่าอย่างมีนัยสำคัญทางสถิติ (<0.05)

สรุป: ค่าใช้จ่ายในการให้บริการทางการแพทย์ในผู้ป่วยเด็กที่รับไว้ในโรงพยาบาลด้วยโรคหืด มีปริมาณเพิ่มขึ้นทุกปี เนื่องจากจำนวนผู้ป่วยที่รับเพิ่มขึ้น แม้ว่าค่าใช้จ่ายต่อคน ต่อครั้ง และต่อวันจะคงที่ ค่าใช้จ่ายในการให้บริการทางการแพทย์นี้จะแปรตามความรุนแรงของโรคหืด
