Estimated Cost of Overactive Bladder in Thailand

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Objective: *To estimate the annual direct and indirect costs of overactive bladder (OAB) in indigenous Thai people aged 18 years and over in the year 2005.*
Material and Method: *Economically based models using diagnostic and treatment algorithms from clinical practice guidelines and current disease prevalence data were used to estimate direct and indirect costs of OAB. Prevalence and event probability estimates were obtained from the literature, national data sets, and expert opinion. Costs were estimated from a small survey using a cost questionnaire and from unit costs of King Chulalongkorn Memorial Hospital.*
Results: *The annual cost of OAB in Thailand is estimated as 1.9 billion USD. It is estimated to consume 1.14% of national GDP. The cost includes 0.33 billion USD for direct medical costs, 1.3 billion USD for direct, non-medical costs and 0.29 billion USD for indirect costs of lost productivity. The largest costs category was direct treatment costs of comorbidities associated with OAB. Costs of OAB medication accounted for 14% of the total costs of OAB.*

Keywords: *Overactive bladder, Annual cost, Direct cost, Indirect cost*

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Overactive bladder (OAB) has been defined by the International Continence Society as a spectrum of symptoms in which incontinence may or may not overlap with urgency, frequency, or nocturia[1]. Slightly more women than men have this disorder. Children and especially the elderly also have it[2]. OAB is not a disease endemic to a particular culture. It is estimated to affect 17-55% of population[2-6], making it one of the most prevalent chronic diseases. Additionally, OAB is often medically unrecognized, with only 20-50% of sufferers seeking medical attention[4]. OAB can lead to burdensome comorbidities. There is evidence to suggest that OAB is associated with an increased risk of falls and fractures, urinary tract infections, skin infections, sleep disturbances and depression[7]. Its consequences are detrimental to the physical and mental health of those who are affected. Even when symptoms are mild, they affect social, sexual, interpersonal, and professional functions[8]. OAB can also increase the burden on the caregivers of elderly or disabled individuals with OAB. Despite their impaired quality of life, the majority of patients do not seek treatment for their condition. Most Asians tend to accept their disease as part of life and try to live with it.

In the United States, the estimated total economic cost of OAB was $12.02 billion in 2000, with $9.17 and $2.85 billion incurred in the community and in institutions respectively[9]. However, these numbers may not represent the true economic and social burdens of OAB because this disorder is underreported and often overlooked by physicians[10-12]. Cost analyses of OAB are relatively limited in Thailand as well as in other developing countries, where approximately 66% of the world's population lives without adequate access to health care[13] and where the economic burden of OAB cannot even begin to be assessed. It is certain that the clinical impact of this disorder will be tremendous as the world's population ages. By 2020, 44% of the world population (7.5 billion) will be > 65 years of age[14]. In Thailand, it is expected that the proportion of the old-age group (more than 60 years old)

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will increase to 23.5% by 2020[13]. Therefore, the considerable financial burden of OAB on the health care system will also increase. Now is the time to convince healthcare providers, health authorities, and funding agencies that the problem of this disorder is real and will become increasingly critical in the future.

Material and Method

The following study framework and perspective of the analysis was societal perspective with a time horizon of one year and study of the direct and indirect costs. Intangible costs were excluded because they are subjective and difficult to assign monetary values.

The direct costs associated with OAB are shown in Table 1.

Indirect costs refer to lost productivity resulting from a decrease in job opportunities or in the number of hours worked. Lost productivity also includes the value of an informal caregiver's time, including nursing time.

The epidemiology data were from two 11-country Asian studies (in 5502 women and 2369 men aged $\geq$ 18 years). These self-administered questionnaire-based studies were conducted in 1998 to quantify the prevalence of OAB population in community-based settings. The prevalence of OAB in females was 34.7% while the rate was lower in males, at 29.9%. Incontinence rate in females (21%) was higher than in males (13%). Treatment seeking behavior was 21% in females and 6% in males. The prevalence of OAB comorbidities before and after treatment was taken from a journal of managed care published in 2000.

The algorithms of OAB patient management, including diagnostic evaluations and treatment strategies, were created from a consensus of an expert panel of four university hospital urologists.

Cost data related to health care expenditure were based on average costs for 2005 at three university hospitals and one general hospital.

Cost data related to personal routine care and transportation expenditures were based on a survey conducted in 150 male and female OAB patients aged 18 years or more attending the Urology Clinic at King Chulalongkorn Memorial Hospital. The questionnaire used here was modified from the Dowell Bryant Incontinence Cost Index (DBICI), developed by C J Dowell et al in 1999[16]. This survey was a part of the study.

Cost data of the work-related productivity loss were based on the minimum national wage.

Table 1. Direct costs associated with overactive bladder[15]

Treatment costs	Medication Behavioral therapy
Routine personal care costs	Incontinence day pads, Disposable bed pads, Hygiene products, Laundry
Consequence costs	Treatment of skin infections due to incontinence, Treatment of urinary tract infections
Other costs	Transportation, Parking

Data analysis

A statistical analysis was simply descriptive. A one-way sensitivity analysis was performed to identify the most sensitive input parameters for the total cost.

Results

Using the prevalence data, the authors came up with the number 14,461,653 as the OAB population in Thailand.

Personal routine care, transportation, and productivity loss data were from the survey conducted at the Urology Clinic at King Chulalongkorn Memorial Hospital. Sixty-one per cent (61%) of patients with incontinence made use of pads, at an average cost per patient per week of 3.7 USD. Transportation cost for one patient per year was 198.12 USD. Average lost time from work associated with OAB for patients and caregivers was 108.12 hours per patient per year. The National Income per Capita in 2003 was 4.64 USD per 8 hours (one shift).

Direct medication costs were from hospital database. The treatment of choice for OAB was medication with 90% drug utilization. Ten per cent of patients received behavioral therapy only. Drug utilization was 40 for oxybutynin, 30 for tolterodine, and 20 for trospium chloride. Thirty-five per cent of patients received one of the anticholinergic drugs in combination with imipramine. Complications included skin irritation from incontinence and urinary tract infection. The authors excluded falls and fractures because it was difficult to track the link between falls/fractures and OAB.

Cost data from hospital database and from a survey are shown in Table 2.

The annual cost of OAB in Thailand was estimated at 1.956 billion USD, which includes 0.33 billion

Table 2. Annual base-case unit cost estimates

Items	Costs/year (USD)	Percentage (%)
Personal routine care		
Cost of absorbent pads	299,289,520	15.3
Laundry	107,565,239	5.5
Transportation	410,335,689	21.0
Medication		
Oxybutynin	74,704,830	3.8
Trospium chloride	51,223,496	2.6
Tolterodine	154,997,215	7.9
Imipramine	1,785,976	0.1
Complications		
UTI	438,438,493	22.4
Skin disease	288,557,731	14.7
Productivity loss	129,950,793	6.6
Total cost of OAB	1,956,848,985	100.0

USD for direct medical costs, 1.3 billion USD for direct, non-medical costs and 0.29 billion USD for indirect costs from lost productivity. Because of higher prevalence and higher percentage of treatment seeking, women had greater cost than men. The largest costs category was direct treatment costs of comorbidities followed by costs of transportation and personal care costs. Costs of OAB medication accounted for 14% of the total costs of OAB. The more patients were treated, the lower the direct treatment costs of OAB comorbidities would be. If all OAB patients were treated, the cost of medication for comorbidities would be reduced by 41%.

A univariate (one-way) sensitivity analysis was undertaken in which one parameter was adjusted at a time. The parameters included prevalence of OAB, proportion of patients seeking treatment, proportion of patients receiving behavioral and pharmacological treatments, cost of personal care, and cost of pharmacological treatment. The sensitivity analysis indicated that total costs were minimally affected by changes in the proportion of patients seeking treatment, the proportion of patients receiving behavioral and pharmacological treatments and the average cost of the personal care and pharmacological treatment. Total costs were most sensitive to changes in prevalence. Reducing prevalence by 10% would reduce the total costs by 20% from 1.95 billion USD to 1.76 billion USD.

Discussions

Cost of illness analyses describes the economic impact of a disease. These studies are used to determine health policy or to make decisions about broad treatment guidelines. Cost of illness studies quantify costs incurred by a population over a defined period of time. The present study is a prevalence-based, cost of illness study aimed at estimating the total cost to society from OAB by aggregating data on the average cost of treatments and forming population estimates. The total cost was calculated from national statistics and by collecting detailed costs of patients from a survey and combining them with prevalence estimates.

Cost of illness for OAB has been addressed in several studies. The most recent study was the National Overactive Bladder Evaluation (NOBLE) program in the US[2], which surveyed approximately 5000 adults. The estimated costs of OAB for community residents in the US in 2000 were around 9.14 billion USD. The estimated nursing home care costs (largely routine care costs such as pads, laundry, nursing aids, etc.) were about 4.4 billion USD. The total costs of OAB in 2000 were 12.6 billion USD.

Several non-US studies on the overall costs of urinary incontinence have recently been published. In 1998, a study in Australia found 1.83 million community-dwelling women over the age of 18 years had urinary incontinence. The total annual direct cost of this condition is estimated at 378 million USD[17]. The current study estimated the cost of OAB in Thailand to be at 1.9 billion USD, or 1.14% of the national GDP.

No cost of illness study for OAB has been done in Asia before, primarily because of limited data on OAB prevalence, cost of care and the impact of OAB on personal life. It is also difficult to estimate productivity loss and intangible costs for OAB accurately. Since the data on the prevalence of OAB in Thailand is not available, the prevalence of OAB in the present study (29.9-34.7%) was based on two 11-country Asian studies[4,5]. This prevalence was much higher than the US (16-17%)[2,6] or Europe (17%)[18]. To complicate matters, these studies used methods of data collection and symptom assessment, definitions of OAB, and study populations.

The sensitivity analysis identified prevalence to have the most effect on the estimated annual cost of OAB. As mentioned above, OAB prevalence studies use different definitions. Our prevalence estimates are higher than those used in previous studies of OAB costs. If the authors used the more conservative prevalence data, as did the US and the EU, the authors would have come up with an estimated annual cost of OAB of 0.9 billion USD, which is approximately 0.55%

Table 3. Adjusted annual costs of OAB in some countries

Country	Year	Adjusted cost (billion USD)
USA[15]	2000	12.6 (direct & indirect cost)
EU[16]	2000	4.5 (direct cost only)
Sweden[18]	2000	0.4-0.63 (direct cost only)
Australia[17]	1998	0.55 (direct cost only)
Thailand[1]	2005	0.9*-1.9 (direct & indirect cost)

* Using US prevalence
[1] The present study

of the national GDP. These costs would have been only about one-half of the amount previously calculated using the Asian prevalence.

Personal routine care, including pads, reusable underpants and laundry, is usually the largest cost category, followed by medication cost and cost of comorbidities. In the present study, the largest cost category was cost of comorbidities, followed by personal routine care cost and cost of transportation. The main reason for this difference is the source data used in the analysis, which was the survey done at King Chulalongkorn Memorial Hospital. This is a tertiary care center located in Bangkok and most of its patients live in Bangkok. The patients may not represent patients who live in provinces. It is believed that the majority of sufferers lives in rural areas and cannot afford sanitary pads thus, may let themselves wet or use rags as absorptive. This will undoubtedly result in a lower health related. Quality of life impact is not accounted for in the presented model. Therefore, the actual cost of illness including quality of life and cost of personal routine care would be greater.

After adjustments for inflation, in dollar terms, the cost of OAB in Thailand is much lower than in Western countries due to the lower cost of living (Table 3).

Since the largest cost category is the cost of comorbidities, appropriate diagnosis and treatment of OAB may reduce the cost burden to the society. The cost of medication is relatively small (14% of total cost), possibly reflecting under-treatment.

Cost analyses of OAB in Thailand have many limitations. There are few comprehensive studies and national data sets that provide prevalence estimates are limited. Accurate prevalence estimates are further hindered by the hidden nature of OAB, especially in some areas where people infrequently seek medical treatment. Furthermore, there is no database on personal routine care costs for OAB. For a more complete perspective of the impact of OAB, future research must take into account the considerable importance of the quality of life associated with OAB.

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การประเมินต้นทุนรายปีของภาวะกระเพาะปัสสาวะไวเกินใน ประเทศไทย

เกรียงศักดิ์ ประสพสันติ, อภิรักษ์ สันติงามกุล, กนกวรรณ พรประสิทธิ์

วัตถุประสงค์*: เพื่อประเมินต้นทุนรายปีทั้งทางตรงและทางอ้อมที่ประเทศไทยต้องแบกรับ ซึ่งเกิดจากภาวะกระเพาะปัสสาวะไวเกินในประชากรไทยอายุตั้งแต่ 18 ปีขึ้นไป ในปี พ.ศ. 2548*

วัสดุและวิธีการ*: การวิเคราะห์ในงานวิจัยนี้เป็นการวิเคราะห์โดยใช้แบบจำลองทางเศรษฐศาสตร์ ข้อมูลที่ใช้ในแบบจำลองนี้ประกอบด้วยข้อมูลทางระบาดวิทยาและการรักษาโรค ข้อมูลด้านต้นทุนและข้อมูลพื้นฐานทางเศรษฐกิจของประเทศไทย โดยข้อมูลด้านระบาดวิทยาและการรักษาโรคได้มาจาก ผลงานวิจัยในอดีต จากแนวปฏิบัติทางเวชคลินิกและบางส่วนจากความเห็นของผู้เชี่ยวชาญ ข้อมูลด้านต้นทุนมาจากฐานข้อมูลของโรงพยาบาลจุฬาลงกรณ์ และจากการสำรวจย่อยในกลุ่มผู้ป่วยที่มารับการรักษาที่โรงพยาบาล*

ผลการศึกษา*: ต้นทุนรวมรายปีของภาวะกระเพาะปัสสาวะไวเกินในประเทศไทยมีมูลค่าประมาณ 1.9 พันล้านเหรียญสหรัฐ หรือเท่ากับ ร้อยละ 1.14 ของมูลค่าผลิตภัณฑ์มวลรวมภายในประเทศเบื้องต้น โดยต้นทุนดังกล่าวประกอบด้วยต้นทุนทางตรงที่เกี่ยวกับการรักษา 0.33 พันล้านเหรียญสหรัฐ ต้นทุนทางตรงที่ไม่เกี่ยวกับการรักษา (เช่นค่าเดินทาง) 1.3 พันล้านเหรียญสหรัฐ ต้นทุนทางอ้อมของการลดกำลังการผลิตจากการขาดงาน 0.29 ล้านเหรียญสหรัฐ ชนิดของต้นทุน ที่มีมูลค่าสูงสุดคือ ต้นทุนทางตรงของการรักษาโรคแทรกที่เกิดจากภาวะกระเพาะปัสสาวะไวเกิน ต้นทุนที่เกิดจากค่ายาคิด เป็นร้อยละ 14 ของต้นทุนทั้งหมด*