Estimated Economic Losses of Hospitalized AIDS Patients at Siriraj Hospital from January 2003 to December 2003: Time for Aggressive Voluntary Counseling and HIV Testing

Winai Ratanasuwan, MD*, Thanomsak Anekthananon, MD*,
Wichai Techasathit, MD*, Yong Rongrungruang, MD**,
Areeaue Sonjai, BSc*, Surapol Suwanagool, MD*

** Department of Preventive and Social Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University*
*** Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University*

This retrospective study was performed to explore the pattern of adult HIV-infected patients admitted to Siriraj Hospital from January 2003 to December 2003 and estimated the economic losses of these patients. Two hundred and forty four medical records were available for review. The proportion of male to female was 2 to 1. Mean age of patients was 36.64 ± 9.72 years. The mean CD_4 count among 112 patients was 82.79 ± 96.49 cell/mm^3. One hundred and twenty four (50.82%) were newly diagnosed of HIV infection. The three most common opportunistic infections were Tuberculosis (42.62%), Pneumocystis carinii pneumonia (14.75%), and cryptococcosis (13.11%). The mean duration of admission was 15.72 ± 15.11 days. The mean expense per admission was 38,194.58 ± 32,354.86 Baht. Fifty four patients (22.13%) died during admission. The mean income of these patients was 3,903.5 ± 3,841.42 baht per month. The estimated economic losses of 54 patients who died during admission including medical care expense and income losses due to premature death was 69,769,739.32 baht. However, the expected medical expense of antiretroviral medications in these 54 patients if they had been diagnosed earlier and their lives had been saved would have been 42,214,608 baht. Therefore, vigorous voluntary counseling and HIV testing in patients aged 13-70 years when they have any risk factors for HIV infection regardless of symptoms might be more cost effective than diagnosis when they get sick.

Keywords: *HIV infection, Acquired immunodeficiency syndrome, Economic losses, Voluntary counseling and HIV testing*

J Med Assoc Thai 2005; 88(3): 335-9
Full text. e-Journal: *http://www.medassocthai.org/journal*

HIV infection is one of the major health problems of Thailand. Despite the skyrocketing advance of knowledge in HIV pathogenesis and management, HIV infection remains an incurable disease. Therefore, the number of HIV patients accumulates everyday. The estimated total number of persons living with HIV in Thailand is 600,000. Although Thailand is one of the countries with a high success of HIV prevention, there are approximately 20,000 new HIV infected persons each year[1]. The economic losses from HIV are enormous in the US[2-5]. Treating HIV patients also costs a lot of money[6-8]. There is a lot of evidence supporting the benefit of antiretroviral drugs in treating HIV patients[9-11]. In the past, antiretroviral drugs were expensive. Only a small number of HIV infected patients in Thailand can get access to appropriate antiretroviral drugs. However, more HIV infected patients get access to anti-retroviral drugs during the last two years because the Government Pharmaceutical Organization of Thailand can produce generic antiretroviral drugs at a lower price. In theory, if HIV infected patients are diagnosed early and have appropriate antiretroviral drugs, they should have good immunity, good health and better cost benefit than if they are diagnosed at a late stage of

Correspondence to : Suwanagool S, Department of Preventive and Social Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.

the disease[6-8]. The present study was done to explore the pattern of HIV-infected patients admitted to Siriraj Hospital from January 2003 to December 2003 and estimate the economic losses of these patients.

Material and Method

The present study was a retrospective study. Medical records of HIV infected patients who were more than 13 years old and admitted to Siriraj Hospital from January 1, 2003 to December 31, 2003 were reviewed. The data were collected including demographic data, CD4 lymphocyte counts, discharge diagnosis, outcome, duration of admission, and details of treatment. For income of patients, the actual income was used if it was available in the medical record. If there was no record of income, the estimated income was used based on patients' education and occupation. The estimated income for unskilled labors was 130 baht per day, for patients with a certificate from a vocational college was 5,000 baht per month, and for patients with a Bachelor degree was 6,000 baht per month. The estimated cost of treatment was calculated based on duration of each disease or condition of each patient. Descriptive statistics of SPSS software were used for analysis. The estimated economic losses of patients were calculated including medical care cost during admission and possible income loss due to premature death in patients who died during admission.

Results

Medical records of 244 HIV/AIDS patients were available for review. The demographic data are shown in Table 1. One hundred and sixty (65.57%) were male and 84 (34.43%) were female. Mean age of the patients was 36.64 $\pm$ 9.72 years (range 13-70 years). Among these 244 patients, CD_4 count was done in 112 (45.9%) patients. The mean CD_4 count was 82.79 $\pm$ 96.49 cell/mm^3 (range 2-528 cell/mm^3). One hundred and twenty four patients (50.82%) were newly diagnosed with HIV infection. The majority of patients were laborers (50.82%). Twenty four (9.8%) were merchants, 20 (8.2%) were civil servants, 16 (6.56%) were housewives, 8 (3.28%) were state enterprise employees, and 15 (6.15%) were un-employed. The mean income of patients were 3,903.50 $\pm$ 3,841.42 baht/month (range 0-25,340 baht/month). Diagnosis of these patients is shown in Table 2. The most common diagnosis was Tuberculosis (42.62%). Other diagnoses included *Pneumocystis carinii* pneumonia (14.75%), cryptococcosis (13.11%), cerebral toxoplasmosis (6.56%), cytomegalovirus disease (5.33%), disseminated MAC infection (5.33%), salmonella bacteremia (4.51%), histoplasmosis (1.64%), progressive multifocal leukoencephalopathy (1.64%), herpes zoster infection (1.23%), infective endocarditis (1.23%), Reiter's syndrome (0.82%), Angioimmunoblastic lymphadenopathy with dysproteinemia (AILD) (0.41%), squamous cell carcinoma (0.41%), and carvernous sinus thrombophlebitis (0.41%). Other diagnoses included hepatic encephalopathy, diabetes mellitus, end stage

Table 1. Demographic characteristics of hospitalized adult HIV/AIDS patients

Characteristic	Number of patients (%)	Mean $\pm$ SD
Age (year)	244 (100.0)	36.64$\pm$9.72
Sex		
Male	160 (65.6)	
Female	84 (34.4)	
CD4 cell count (cells/mm3)	112 (45.9)	82.79$\pm$96.49
HIV status on admissions		
Newly diagnosed	124 (50.8)	
Known	120 (49.2)	
Occupation		
Labor	124 (50.8)	
Merchant	24 (9.8)	
State enterprise	8 (3.3)	
Civil servants	20 (8.2)	
House wife	16 (6.6)	
Unemployed	15 (6.2)	
Not specify	37 (15.2)	
Income per month		3903.5$\pm$3841.42

Table 2. Diagnosis among hospitalized adult HIV/AIDS patients

Diagnosis	Number (%)
Tuberculosis	104 (42.6)
Pneumocystis carinii pneumonia	36 (14.8)
Cryptococcosis	32 (13.1)
Cerebral toxoplasmosis	16 (6.6)
Cytomegalovirus disease	13 (5.3)
Disseminated MAC infection	13 (5.3)
Salmonella bacteremia	11 (4.5)
Histoplasmosis	4 (1.6)
Progressive multifocal leukoencephalopathy	4 (1.6)
Herpes zoster infection	3 (1.2)
Infective endocarditis	3 (1.2)
Reiter's syndrome	2 (0.8)
Angioimmunoblastic lymphadenopathy with dysproteinemia	1 (0.4)
Squamous cell carcinoma	1 (0.4)
Carvernous sinus thrombophlebitis	1 (0.4)
Others	22 (9.0)

Table 3. Outcome and Estimated economic loss of hospitalized HIV/AIDS patients

	Number (%)	Mean ± SD
Duration of admission	244 (100.0)	15.72±15.11
Expense during admission	244 (100.0)	38194.58±32354.86
Outcome		
Improve	190 (77.9)	
Death	54 (22.1)	
Economic loss per year due to early death (baht)		46842

renal disease, hepatocellular carcinoma, and pulmonary embolism. The mean duration of admission was 15.72 ± 15.11 days (range 2-67 days). The mean expense per admission was 38,194.58 ± 32,354.86 baht (range 3,240-115,000 Baht). Fifty four patients (22.13%) died during admission.

Discussion

From the present study, 124 (50.82%) were newly diagnosed with HIV infection. All of them were categorized as full blown AIDS patients. The mortality rate of the patients in the present study was quite high (22.13%). The mean age of these patients was only 36.64 years. They were in the working age group. They should have been able to work and generate domestic products for the country. Because very effective antiretroviral drugs are available at an affordable price in Thailand, most of the patients who died during the present study should have survived if HIV infection had been diagnosed 2-3 years earlier. The economic losses of these patients included direct health care expense and income losses due to premature death. Direct health care expense per admission for these patients was 38,194.58 baht. Therefore, the total cost for 54 patients was 2,062,507.32 baht. Fifty four patients died at a mean age of 34.64 years. Assuming these 54 patients had been diagnosed earlier and their lives were saved with antiretroviral drugs they could have worked until retiring at the age of 60 years. They would have been able to work for approximately 24 years more. The average income of patients in the present study was 3,903.5 baht per month. Then, these 54 patients would have been able to generate an income of 3,903.50 x 12 x 24 x 54 which will be equal to 60,707,232 baht. However, if the authors had diagnosed HIV infection in these 54 patients earlier and had saved their lives until the age of 60 years, there would have been expense for antiretroviral drugs and laboratory tests during that 24 years. Based on the study of GPO-Vir, the patients can tolerate and have good viral suppression with GPO-Vir approximately 70% after the first year[12]. Assuming 10% of patients cannot tolerate nevirapine and have to use efavirenz instead of nevirapine; 5% of patients cannot tolerate stavudine and have to use zidovudine instead of stavudine; 5% of patients cannot tolerate nevirapine + stavudine and have to use efavirenz + zidovudine instead of nevirapine + stavudine; 5% of patients cannot tolerate nevirapine and efavirenz and have to use indinavir/ritonavir instead of nevirapine or efavirenz; 5% may develop resistance to nevirapine or efavirenz and lamivudine and have to use didanosine + indinavir/ritonavir + stavudine or zidovudine; then the average cost of antiretroviral drugs plus CD4 testing and HIV-RNA monitoring every 6 months will be approximately 32,573 baht per year. This cost based on current cost of CD4 testing, HIV-RNA assay, and current anti-retroviral drugs. Therefore, 24 years of life of 54 HIV patients will be saved with the cost of 32,573 x 24 x 54 which is equal to 42,214,608 baht.

Comparing the cost of 42,214,608 baht for medications and necessary laboratory tests for 54 HIV patients for 24 years to the health care expense of 69,769,739.32 baht when these patients came to the hospital with late stage of disease and died during admission, the first approach seemed to be more cost effective. Therefore, identifying HIV patients in the early stage of the disease and treating them with antiretroviral drugs seems more cost effective than the current practice. One strategy to diagnose HIV infected patients early would be vigorous voluntary counseling and HIV testing (VCT) such as asking every patient aged 13-70 years regardless of symptoms if they have risk factors for acquiring HIV infection (unsafe sex or sharing needles in IDU patients) then recommending them to have HIV testing. Among those patients who survived after admission, the health care expense and the productivity was the same rate as the calculation in patients who died during admission. Compared to HIV management in developed countries, such as the USA, the cost of treatment initially increased due to the antiretroviral treatment costs, but those costs were offset by a large decrease in inpatient-related costs[13]. Other studies also supported that antiretroviral treatment was cost effective[14-18]. However, once the patients are diagnosed with HIV infection, the next important step would be appropriate care for every new HIV patient. In the US, patients with positive HIV test results often delay for more than a year before seeking medical care[19].

In conclusion, it seems to be cost-effective if doctors can diagnose HIV infected patients early and treat them with antiretroviral drugs when indicated. Vigorous voluntary counseling and HIV testing (VCT) may be needed to identify HIV patients earlier than the current practice.

References

1. Result of HIV sero-surveillance, Thailand 1989-2004 (round 1-22). Ministry of Public Health of Thailand. http://epid.moph.go.th
2. Gebo KA, Chaisson RE, Folkemer JG, Bartlett JG, Moore RD. Costs of HIV medical care in the era of highly active antiretroviral therapy. AIDS 1999; 13: 963-9.
3. Green J, Arno PS. The 'Medicaidization' of AIDS. Trends in the financing of HIV-related medical care. JAMA 1990; 264: 1261-6.
4. Hardy AM, Rauch K, Echenberg D, Morgan WM, Curran JW. The economic impact of the first 10,000 cases of acquired immunodeficiency syndrome in the United States. JAMA 1986; 255: 209-11.
5. Seage GR 3rd, Landers S, Barry A, Groopman J, Lamb GA, Epstein AM. Medical care costs of AIDS in Massachusetts. JAMA 1986; 256: 3107-9.
6. Palella FJ Jr, Delaney KM, Moorman AC, Loveless MO, Fuhrer J, Satten GA, et al. Declining morbidity and mortality among patients with advanced human immunodeficiency virus infection. HIV Outpatient Study Investigators. N Eng J Med 1998; 338: 853-60.
7. Hogg RS, O' Shaughnessy MV, Gataric N, Yip B, Craib K, Schechter MT, et al. Decline in deaths from AIDS due to new antiretrovirals. Lancet 1997; 349: 1294.
8. Hammer SM, Squires KE, Hughes MD, Grimes JM, Demeter LM, Currier JS, et al. A controlled trial of two nucleoside analogues plus indinavir in persons with human immunodeficiency virus infection and CD4 cell counts of 200 per cubic millimeter or less. N Engl J Med 1997; 337: 725-33.
9. Anekthananon T, Ratanasuwan W, Techasathit W, Sonjai A, Suwanagool S. Safety and efficacy of a simplified fixed-dose combination of stavudine, lamivudine and nevirapine (GPO-VIR) for the treatment of advanced HIV-infected patients: a 24-week study. J Med Assoc Thai 2004; 87: 760-7.
10. Keiser P, Nassar N, Kvanli MB, Turner D, Smith JW, Skiest D. Long-term impact of highly active antiretroviral therapy on HIV-related health care costs. J Acquir Immune Defic Syndr 2001; 27: 14-9.
11. Phillips KA, Fernyak S. The cost-effectiveness of expanded HIV counselling and testing in primary care settings: a first look. AIDS 2000; 14: 2159-69.
12. Bozzette SA, Joyce G, McCaffrey DF, Leibowitz AA, Morton SC, Berry SH, et al. Expenditures for the care of HIV-infected patients in the era of highly active antiretroviral therapy. N Engl J Med 2001; 344: 817-23.
13. Hay JW, Osmond DH, Jacobson MA. Projecting the medical costs of AIDS and ARC in the United States. J Acquir Immune Defic Syndr 1988; 1: 466-85.
14. Hellinger FJ. The lifetime cost of treating a person with HIV. JAMA 1993; 270: 474-8.
15. Keiser P, Kvanli MB, Turner D, Reisch J, Smith JW, Nassar N, et al. Protease inhibitor-based therapy is associated with decreased HIV-related health care cost in men treated at a Veteransh Administration hospital. J Acquir Immune Defic Syndr 1999; 20: 28-33.
16. Shapiro MF, Morton SC, McCaffrey DE, Senterfitt JW, Fleishman JA, Perlman JF, et al. Variations in the care of HIV-infected adults in the United States: results from the HIV Cost and Services Utilization Study. JAMA 1999; 281: 2305-15.
17. Hellinger FJ, Fleishman JA. Estimating the national cost of treating people with HIV disease: patient, payer, and provider data. J Acquir Immune Defic Syndr 2000; 24: 182-8.
18. Moore RD. Cost effectiveness of combination HIV therapy: 3 years later. Pharmacoeconomics 2000; 17: 325-30.
19. Samet JH, Freedberg KA, Stein MD, Lewis R, Savetsky J, Sullivan L, et al. Trillion virion delay: time from testing positive for HIV to presentation for primary care. Arch Intern Med 1998; 158: 734-40.

ความสูญเสียทางเศรษฐกิจ ของผู้ป่วยเอดส์ ที่เข้ารับการรักษาในโรงพยาบาลศิริราช ระหว่างเดือนมกราคม พ.ศ. 2546 ถึงเดือนธันวาคม พ.ศ. 2546: ถึงเวลาสำหรับมาตรการ การค้นหาผู้ป่วยอย่างจริงจัง

วินัย รัตนสุวรรณ, ถนอมศักดิ์ อเนกธนานนท์, วิชัย เตชะสาธิต, ยงค์ รงค์รุ่งเรือง, อารีเอื้อ สนใจ, สุรพล สุวรรณกูล

การศึกษานี้เป็นการศึกษาแบบย้อนหลังจากการทบทวนรายงานผู้ป่วยที่ติดเชื้อเอชไอวี/เอดส์ผู้ใหญ่ที่ได้รับการรักษาตัวในโรงพยาบาลศิริราช ตั้งแต่ 1 มกราคม พ.ศ. 2546 ถึง 31 ธันวาคม พ.ศ. 2546 เพื่อศึกษารายละเอียดการเจ็บป่วยของผู้ป่วยเหล่านี้ โดยเน้นเรื่องความสูญเสียทางเศรษฐกิจ จากการศึกษาพบว่ามีผู้ป่วยที่เข้าเกณฑ์ทั้งหมด 244 ราย อัตราส่วนผู้ป่วยชายต่อผู้ป่วยหญิงประมาณ 2 ต่อ 1 โดยอายุเฉลี่ยของผู้ป่วยคือ 36.64 ± 9.72 ปี ค่าเฉลี่ยของเซลล์เม็ดเลือดขาวซีดี 4 ของผู้ป่วยที่ได้รับการตรวจ 112 คนคือ 82.79 ± 96.49 เซลล์/ลบ.มม. โรคติดเชื้อแทรกซ้อนที่ทำให้ผู้ป่วยต้องนอนโรงพยาบาลบ่อย 3 อันดับแรกคือ วัณโรค (42.62%) ปอดอักเสบจากเชื้อ P. carinii (14.75%) และโรคจากเชื้อ Cryptococcus (13.11%) ระยะเวลาเฉลี่ยที่ผู้ป่วยต้องนอนรักษาตัวในโรงพยาบาลคือ 15.72 ± 15.11 วัน ค่ารักษาพยาบาลโดยเฉลี่ยแต่ละครั้งคือ 38,194.58 ± 32,354.86 บาท ผู้ป่วยเสียชีวิตขณะรับการรักษาในโรงพยาบาลจำนวน 54 ราย (22.13%) รายได้โดยเฉลี่ยของผู้ป่วยกลุ่มนี้คือ 3,903.5 ± 3,841.42 บาทต่อเดือน ความเสียหายทางเศรษฐกิจเฉพาะรายที่เสียชีวิตก่อนวัยอันสมควรคำนวนจากค่าใช้จ่ายในการรักษาในโรงพยาบาลครั้งนี้ รวมกับรายได้ที่ผู้ป่วยควรจะทำได้หากมีอายุจนถึงวัยเกษียณอายุ คิดเป็นเงิน 69,769,739.32 บาท หากเราสามารถทำให้ผู้ป่วยเหล่านี้ทราบสถานะการติดเชื้อเอชไอวี ได้เร็วขึ้น เราอาจสามารถช่วยชีวิตผู้ป่วยไว้ได้ แต่ก็จะต้องมีค่ายาต้านไวรัสเอชไอวี รวมทั้งค่าตรวจทางห้องปฏิบัติการที่จำเป็น ซึ่งค่าใช้จ่ายสำหรับผู้ป่วย 54 คน จนถึงวัยเกษียณอายุคิดเป็นมูลค่าโดยประมาณ 42,214,608 บาทซึ่งคุ้มค่ากว่า โดยสรุป การมีมาตรการที่จะทำให้ผู้ติดเชื้อเอชไอวี ทราบสถานะการติดเชื้อเอชไอวีของผู้ป่วยให้เร็วขึ้น เช่น การแนะนำผู้ป่วย อายุ 13-70 ปี ที่มีประวัติเสี่ยงต่อการติดเชื้อ เอชไอวีทุกคน ถึงแม้จะยังไม่มีอาการใด ๆ ตรวจเลือดหาการติดเชื้อ เอชไอวี น่าจะเป็นวิธีที่คุ้มค่ากว่าการรอให้ผู้ป่วยมาโรงพยาบาลเมื่อป่วยเป็นโรคแทรกซ้อนแล้ว เช่นในปัจจุบัน