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

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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 CD4 count among 112 patients was 82.79 ± 96.49 cell/mm³. 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

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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. The economic losses from HIV are enormous in the US. HIV patients also costs a lot of money. There is a lot of evidence supporting the benefit of antiretroviral drugs in treating HIV patients. 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
the disease\cite{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 ± 9.72 years (range 13-70 years). Among these 244 patients, CD4 count was done in 112 (45.9%) patients. The mean CD4 count was 82.79 ± 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 ± 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 bactrearia (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 (0.41%), squamous cell carcinoma (0.41%), and carvernous sinus thrombophlebitis (0.41%). Other diagnoses included hepatic encephalopathy, diabetes mellitus, end stage...
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 ± 32,354.86 baht (range 3,240-115,000 Baht). Fifty four patients (22.13%) died during admission.

<table>
<thead>
<tr>
<th>Number (%)</th>
<th>Mean ± SD</th>
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<tr>
<td>Duration of admission</td>
<td>244 (100.0)</td>
<td>15.72 ± 15.11</td>
<td>Expense during admission</td>
<td>244 (100.0)</td>
<td>38194.58 ± 32354.86</td>
<td>Outcome</td>
<td>Improve</td>
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<td>Death</td>
<td>54 (22.1)</td>
<td>36,194.58 ± 32,354.86</td>
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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
ความสูญเสียทางเศรษฐกิจของผู้ป่วยเอดส์ ที่เข้ารับการรักษาในโรงพยาบาลศิริราช ระหว่างเดือน มกราคม พ.ศ. 2546 ถึงเดือนธันวาคม พ.ศ. 2546: ถึงเวลาสำหรับมาตรการการสนับสนุนผู้ป่วยของทางจริงจัง

วันนี้ ร้านสรุปร่าง ถนอมศักดิ์ ถนอมอานันท์ วิชัย เชาสนิติ์ องค์ วงศ์วิจิตร อารีย์ สนใจ สุรพล สรุวะใน

การศึกษาที่นี้เป็นการศึกษาแบบย้อนหลังจากการรวบรวมรายงานผู้ป่วยที่ติดเชื้อเอชไอวี/เอดส์ผู้ใหญ่ ที่ได้รับการรักษาคัดในโรงพยาบาลศิริราช ตั้งแต่ 1 มกราคม พ.ศ. 2546 ถึง 31 ธันวาคม พ.ศ. 2546 เพื่อศึกษารายละเอียดการเจ็บป่วยของผู้ป่วยทั้งนี้ โดยเน้นเนื่องด้วยความสูญเสียทางเศรษฐกิจ จากการศึกษาพบว่ามีผู้ป่วยที่เข้าเกณฑ์ทั้งหมด 244 ราย อัตราส่วนผู้ป่วยชายต่opiผู้ป่วยหญิงประมาณ 2 ต่อ 1 โดยอาญาติของผู้ป่วยคือ 36.64 ± 9.72 ปี ความเสี่ยงของเขตเส้นทางตรวจตรวจหัวใจ 4 ของผู้ป่วยที่ได้รับการตรวจ 112 คนคือ 82.79 ± 96.49 เซลล์/ลบ.มม. โรคติดเชื้อแฝกที่ทำให้ผู้ป่วยต้องนอนโรงพยาบาล 3 ที่นับแรกคือ วินโรค (42.62%) โรคก้านจากเชื้อ P. carinii (17.5%) และโรคจากเชื้อ Cryptococcus (13.11%) ระบาดเสื่อมเสียที่ผู้ป่วยต้องนอนโรงพยาบาล 15.72 ± 15.11 วัน ค่ารักษาภายนอกโดยเฉลี่ยคิดเป็น 38,194.58 ± 32,354.86 บาท ผู้ป่วยที่ติดเชื้อเอดส์มีการเกิดการติดเชื้อในโรงพยาบาลจำนวน 54 ราย (22.13%) รายได้โดยเฉลี่ยของผู้ป่วยที่สูญเสียคือ 3,903.5 ± 3,841.42 บาทต่อเดือน ความเสี่ยงทางเศรษฐกิจจากการที่เพื่อการใช้คุณค่าความคาดหวังจากคาร์ไนซ์ในการรักษาในโรงพยาบาล ขั้นต้น รวมๆกับรายได้ที่ผู้ป่วยควรจะทำได้หากมีอายุจนถึงวัยเกษียณอายุ คิดเป็นเงิน 69,769,739.28 บาท หากสามารถทำให้ผู้ป่วยเหล่านี้ทราบอาการหรือการติดเชื้อวินโรค ได้เร็วขึ้น เราอาจสามารถช่วยลดการติดเชื้อได้ แต่ก็จะต้องมีความคุ้มค่าในการรักษา เวลาตัวจริงทางของปฏิบัติการที่ทำมาจาก ซึ่งควรจะทำสำหรับพยาบาล 54 คน จนถึงวัยเฉลี่ยอายุคิดเป็นสุทธิโดยประมาณ 42,214,608 บาทซึ่งคุ้มค่ากว่า โดยสรุป การมีมาตรการที่จะทำให้ผู้ติดเชื้อวินโรคทราบถึงการติดเชื้อวินโรคให้เร็วขึ้น เช่น การแนะนำการตรวจ 13-70 ปี ที่มีประวัติเสี่ยง ต้องการติดเชื้อวินโรคทุกครั้ง จึงเหมาะสมไม่เหมือนกระโดด ๆ ตรวจสอบอาการติดเชื้อวินโรค การมีมาตรการที่จะทำให้ผู้ป่วยมีโอกาสของโรคต้องรู้และเข้าใจในปัจจุบัน

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