Predictive Factors of Antiretroviral (ARV) Drug Adherence among People Living with HIV/AIDS Attending at Taksin Hospital, Bangkok, Thailand

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Objective: *Cross-sectional survey research aimed at studying predictive factors of antiretroviral (ARV) drug adherence among people living with HIV/AIDS (PWHA) who attended Tawan Mai, an outpatient clinic, Taksin Hospital, Bangkok.*
Material and Method: *The sample group was 230 PWHA. A random sampling technique was used to select the sample. Data were collected by interview questionnaire between July 1, and September 30, 2009. The data was analyzed by frequency, percentage, mean, standard deviation, Pearson's Product Moment Correlation, and stepwise multiple regression analysis.*
Results: *The results showed that 61.8% of the PWHA had a good level of ARV drug adherence. Factors significantly predicting ARV drug adherence ($p < 0.05$) were family support, perception on severity of HIV/AIDS, adverse effects of the ARV drug, and knowledge on HIV/AIDS and ARV therapy. These factors were able to predict ARV drug adherence correctly at 26.8%.*
Conclusion: *From these findings, the authors recommend health providers to encourage family members to give family support to PWHA and to provide PWHA with more knowledge on HIV/AIDS and ARV therapy to enhance more self awareness for treatment adherence as well as to raise the perception on HIV/AIDS severity and adverse effects of ARV drug.*

Keywords: *HIV/AIDS, Antiretroviral (ARV) drug adherence, PWHA*

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At present HIV/AIDS is still a major health problem in every region. UNAIDS reported on the global epidemics of HIV/AIDS at the end of 2008 and there were 33.4 million people infected with the disease and 2.7 million new infections[1]. As a global issue, the HIV/AIDS situation in Thailand remains an important health problem affecting both social and economic development of the country. The total cumulative number of AIDS patients in Thailand at the end of 2009 was 358,260 persons and 95,983 deaths[2]. The majority of people living with HIV/AIDS (PWHA) in Thailand are between 20 and 44 years old, with more than 80% of the infections coming from the heterosexual route and more than 40% of the new infections being women. Among the PWHA, around 88% received antiretroviral therapy under the universal coverage program[3,4].

Without antiretroviral therapy, HIV/AIDS patients would quickly die from opportunistic infections. Antiretroviral (ARV) therapy is a key strategy to maintain longevity among PWHA[5,6]. Highly Active Antiretroviral Therapy (HAART) is a combination of three drugs for lifelong treatment of HIV/AIDS[5-8]. An important concern on ARV treatment is a patient's drug adherence. High ARV drug adherence will induce successful ARV treatment with results of increasing immunological level, viral load suppression and patient's increased quality of life[7,8].

From previous findings, factors related to ARV drug adherence of the PWHA were being aged 35 years or less, sex, education, employment status, alcohol use, length of HIV infection, length of ARV treatment, HIV status, perception on severity of HIV/AIDS, perception on adverse effects of ARV drug, positive provider interactions, availability of treatment and family support[9-16].

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Taksin Hospital is a tertiary hospital under the Department of Medical Services, Bangkok Metropolitan Administration. Tawan Mai Clinic, an outpatient clinic at Taksin Hospital was established to provide care and support for PWHA. At the end of 2008, there were 1,869 cases of PWHA with 1,202 of them enrolled in the ARV therapy under the universal coverage program[17]. From a health service record it was found that 13.3% of the PWHA who received ARV therapy were drug resistant due to poor adherence behaviors[18]. To help the PWHA to maintain good ARV drug adherence to reduce opportunistic infections and increase their longevity, the ARV drug adherence and its predicted factors based on the PRECEDE-PROCEED framework of Green LW and Kreuter MW[19] were explored. Findings would be used as a guideline for planning and implementing effective strategies to promote ARV drug adherence among the PWHA to reduce morbidity and mortality from opportunistic infection. They also could be used as a guideline for comprehensive counseling programs among PWHA and their family.

Material and Method

A cross-sectional study was conducted to collect data by interview questionnaire between July 1 and September 30, 2009. The study population was the PWHA aged equal to or more than 15 years who came for treatment and care at Tawan Mai Clinic, Taksin Hospital, Bangkok. The samples were both the newly diagnosed PWHA and the chronic cases that were able to communicate, had no serious health problems, did not need to be hospitalized, were willing to participate in the present study and signed a consent form. The sample size was calculated by the formula of average population estimation. Total sample size was 230 cases. A random sampling technique from patients' list by queue in each day was used to select the sample patients who met the inclusion criteria.

The research instrument was an interview questionnaire to examine the predisposing factors and was composed of demographic characteristics, knowledge on HIV/AIDS and ARV therapy and perception on severity of HIV/AIDS and adverse effects of the ARV drug. The enabling factors consisted of accessibility to healthcare services and relationship with health providers. The reinforcing factors consisted of social support from family. The questionnaire was divided into six parts. Part 1 was demographic characteristics of the HIV/AIDS patients, which were sex, age, marital status, education, occupation, income, length of ARV therapy, experience of receiving knowledge or information on ARV therapy from health providers, type of health insurance, average cost spent per each visit, number of ARV tablets taken per day, and number of all drug tablets taken per day. Part 2 was 10 questions on knowledge of HIV/AIDS and ARV therapy based on the HIV/AIDS-Knowledge Questionnaire of Carey MP et al[20]. Part 3 was 14 questions regarding perception on severity of HIV/AIDS and adverse effects of the ARV drug. Part 4 was 10 questions on accessibility to healthcare services and relationship with health providers. Part 5 was 15 questions on family support based on concepts of Tardy CH[21]. Part 6 was 14 questions on ARV drug adherence of the HIV/AIDS patients adapted from Antiretroviral General Adherence Scales (AGAS)[9], a self-assessment reports during one month.

Content validity was examined by three experts and a reliability test given to 30 HIV/AIDS patients who attended the OPD clinic of Rajchapipat Hospital, Bangkok. The Cronbrach's alpha coefficient of each part was as follows, knowledge on HIV/AIDS and ARV therapy = 0.708, perception on severity of HIV/AIDS and adverse effects of ARV drug = 0.71, accessibility to healthcare services and relationship with health providers = 0.87 and family support = 0.89.

Frequencies, percentage, mean and standard deviation were used to describe demographic characteristics, perception on severity of HIV/AIDS and adverse effects of ARV drug, accessibility to healthcare services and relationship with health providers, family support and ARV drug adherence. Pearson's product moment correlation coefficient was used to find out factors correlated to the HIV/AIDS patients' ARV drug adherence. Stepwise multiple regression analysis was also used to determine the predicting factors of ARV drug adherence. The level of statistical significance was at $p < 0.05$. The research proposal was approved by the Committee on Human Rights Related to Human Experimentation, Mahidol University (MU 2009-093).

Results

Demographic characteristics

It was found that 55.2% of the PWHA were female and nearly half of them (47.8%) were 31-40 years old. Nearly half (44.4%) were married, 43.5% completed primary school level, followed by 36.9% who had completed secondary school. More than half of them (60.4%) had their own occupation as laborer while 17.4% were unemployed. More than half (57%) had an

income equal to or less than 7,500 baht/month. Concerning duration of ARV therapy, 59% had duration of ARV therapy equal to or less than 36 months with an average 38.82 + 14.42 months, min-max = 12-180 and the majority of them (72.6%) had experienced receiving knowledge on HIV/AIDS and ARV therapy.

ARV drug adherence of HIV/AIDS patients

Regarding each item of ARV drug adherence during the last one month, it was found that most of them reported always continuing to take drugs (95.7%), always going to see the doctor and receiving the ARV drug on time (94.8%), always taking the ARV drug at every meal according to the prescription (94.8%), never decrease or increase the dose of the ARV drug themselves (94.8%), never stopping the use of the drug themselves when having some adverse effects or without the doctor's suggestion (93.0%), always using a clock to monitor the right time for taking the drug (90%), always taking the drug at the right time as prescribed by the doctor (86.5%), and never forgetting to take the drug while travelling or enjoying a party (83.3%). While the lowest practice reported on always remembering to take the drug at the right time within a 30 minute margin of error (44.8%) and always counting the number of pills left after taking the drug (34.8%) as shown in Table 1. More than half of them (61.8%) had a good level of ARV drug adherence with a score more than 80% of the total or more than 35 scores. Mean scores of ARV drug adherence were equal to 38.10 + 2.97, min-max = 20-42 (Table 2).

Factors associated with ARV drug adherence

From Chi-square test for categorical variables of predisposing factors significantly associated with ARV drug adherence, sex was the only factor found to be significantly associated with ARV drug adherence.

From Pearson's correlation analysis between numeric variables of predisposing, enabling and reinforcing factors, and ARV drug adherence of the PWHA, it was found that knowledge on HIV/AIDS and ARV therapy, perception on severity of HIV/AIDS,

Table 1. ARV drug adherence behaviors from self-report (n = 230)

Item	ARV adherence behaviors	Percentage of answer		
		Always	Sometimes	Never
1	Continuing use of the drug	95.7	2.6	1.7
2	Go to see the doctor for physical check up and receive the drug on time.	94.8	3.9	1.3
3	Take ARV drug every meal as prescribed.	94.8	1.7	3.5
4	Increase or decrease dose of ARV drug when feeling better or when adverse effects are found.	4.8	0.4	94.8
5	Stop taking ARV drug when having adverse effects without consulting the doctor.	3.9	3.0	93.0
6	Use a clock to monitor right time for taking the drug.	90.0	6.5	3.5
7	Take ARV drug on time as prescribed.	86.5	11.3	2.2
8	Forget to take the drug when travelling or enjoying a party.	4.8	10.9	83.3
9	Use ARV drug combined with herbal medicine.	5.7	11.3	83.0
10	Read labels of ARV container before taking drug.	76.1	18.3	5.7
11	Bored to fully comply with ARV regimen as prescribed by a doctor.	10.0	15.2	74.8
12	Never stop taking ARV drug when having adverse effects.	66.5	6.5	27.0
13	Forget to take the drug on time (within 1/2 hours).	5.7	49.6	44.8
14	Count number of ARV pills left after taking them.	34.8	41.7	23.5

Table 2. Level of ARV drug adherence of HIV/AIDS patients (n = 230)

Level of ARV drug adherence scores	Number	%
Need to be improved (0-34 marks or $\leq$ 80%)	88	38.2
Good ($\geq$ 35 marks or $\geq$ 80%)	142	61.8
Mean $\pm$ SD = 38.10 $\pm$ 2.97, Min = 20, Max = 42		

adverse effects of ARV drug, accessibility to health services, and family support were correlated with ARV drug adherence (Table 3).

Predictive factors on ARV drug adherence of PWHA using stepwise multiple regression analysis

The significant predictive factors on ARV drug adherence among PWHA consisted of family support, perception on severity of HIV/AIDS and adverse effects of ARV drug and knowledge on HIV/AIDS and ARV therapy. This model was able to predict the ARV drug adherence correctly at 26.8% of the time. The factor with highest influence on ARV drug adherence of PWHA was family support (Beta = 0.356) followed by perception on severity of HIV/AIDS and adverse effects of ARV drug (Beta = 0.187) and knowledge on HIV/AIDS and ARV therapy (Beta = 0.091) as shown in Table 4.

Discussion

ARV drug adherence of PWHA

Around 62% of the respondents had their ARV drug adherence at a good level. When considering each item of ARV drug adherence, always continuing to take the drug, always going to see the doctor and receiving the ARV drug on time were found to be most practiced among the PWHA, while forgetting to take the drug at the right time and forgetting to count the pills after taking the drug were found to have been practiced at the lowest level. These findings were similar to the previous studies done by Do NT et al[10] and Duenhan Monreal MTF et al[22]. This may be explained by the reasons that the PWHA need to follow recommendations from the doctor that they continue taking the drug and also that the majority of them (72.6%) had experienced receiving knowledge on ARV therapy from health personnel. When the PWHA realized the importance of ARV adherence to maintaining their CD4 level, they would follow the prescription from the doctor. Concerning the lowest practice on ARV drug adherence, always remembering to take the drug on time and count pills were found to be the lowest. This may be due to the majority of the PWHA (60.4%) having their own occupation and during work, sometimes not having time to take the drug at the right time.

Factors predicting ARV drug adherence behaviors of HIV/AIDS patients

From the findings, family support, perception on severity of HIV/AIDS and adverse effects of the ARV drug, and knowledge on HIV/AIDS and ARV therapy were the significant predicting factors of ARV drug adherence among the PWHA. The highest level

Table 3. Correlation coefficient between predicting factors of drug adherence and ARV drug adherence of PWHA (n = 230)

Variables	Pearson's correlation coefficient	p-value
Knowledge on HIV/AIDS and ARV therapy	0.251	0.005*
Perception of severity of HIV/AIDS and adverse effects of ARV drug	0.330	<0.001*
Accessibility to health services	0.131	0.048*
Relationship with health providers	0.010	0.820
Family support	0.480	<0.001*

* Significant at p-value < 0.05

Table 4. Predictive factors of ARV drug adherence of PWHA by stepwise multiple regression analysis (n = 230)

Predictors	Stepwise multiple regression		
	B	Beta	p-value
Support from family	0.328	0.356	<0.001
Perception on severity of HIV/AIDS and adverse effects of ARV drug	0.163	0.187	0.004
Knowledge on HIV/AIDS and ARV therapy	0.089	0.091	0.038

B_0 = 25.10, B_1 = 95% CI, R^2= 0.285, Adjusted R^2 = 0.268

predicting factor was having support from family. When having a lifelong illness like HIV/AIDS, the PWHA need to see the doctor and partake in ongoing treatment as recommended. Family support is necessary for PWHA to confront HIV/AIDS. Most of the PWHA need support from family in terms of their living arrangements, finance, health information, and psychological support to motivate them when facing each stage of the disease, and to cope with suffering their symptoms as well as fully comply of ARV regimens[23]. The PWHA who have strong family support will enhance their sense of fully comply with ARV drug adherence while those who have weak social support will feel a lack of self-efficacy in the practice of ARV drug adherence. The present result was similar to the study of McDonnell Holstad MK et al[9], Kim HJ et al[11], Safren SA et al[16], Kattika T and Kusol S[21] and Amberbir A et al[24].

The second predictor for ARV drug adherence was perception on severity of HIV/AIDS and adverse effects of the ARV drug. This can be explained by the reason that perception on severity of illness is a positive motivator for medication adherence to increase CD4 level[9]. The PWHA who perceived less adverse effects of the ARV drug would continue to take the drug as prescribed while those who felt more adverse effects would stop taking the drug[24,25].

The last predictor was knowledge on HIV/AIDS and ARV therapy. This finding was similar to the studies of Han N et al[26] and Potchoo Y et al[27] in which, receiving knowledge from health personnel helped the PWHA to increase their awareness of disease severity and consequences from non-adherence and to follow the prescription for the ARV drug and thus maintain their health status.

From findings, the most public health concern of ARV therapy is how to negotiate HIV/AIDS patients to maintain their CD4 level by adhering to the drug. Health personnel should pay a vital role to encourage tireless support by family members of the PWHA to increase the PWHA's motivation for adherence behavior to the ARV drug. Additional, routine services for the PWHA should integrate multiple methods for effective provision of knowledge and information on HIV/AIDS care and support and ARV therapy to improve their perception on severity of the illness and benefits of adherence to ARV therapy in order to prevent opportunistic infection and cancers as well as to elevate PWHA quality of life and increase their lifespan.

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Potential conflicts of interest

None.

References

1. UNAIDS/WHO. Global HIV/AIDS situation [database on the Internet]. 2009 [cited 2010 Oct 30]. Available from: http://data.unaids.org/pub/Report/2009/jc1700_epi_update_2009_en.pdf
2. Bureau of Epidemiology, Disease Control Division, Ministry of Public Health. Available on line from: http://www.aidsthai.org/index. Access on 8/11/2009.
3. Heterosexual transmission in Thailand: HIV subtype E in Thailand, and blood test. 2009 [cited 2009 Nov 8]. Available from: http://www.thailandguru.com/hiv-aids-thailand.html
4. HIV/AIDS health profile-Thailand region in 2008. Available on line from: www.usaid.gov/our_work/global_health/.../thailand_profile.pdf Access on 11/11/2010.
5. Paterson DL, Swindells S, Mohr J, Brester M, Vergis EN, Squier C, et al. Adherence to protease inhibitor therapy and outcomes in patients with HIV infection. Ann Intern Med 2000; 133: 21-30.
6. UNAIDS. Handbook on access to HIV/AIDS-related treatment: a collection of information tools and resources for NGOs, CBOs and PLWHA groups. Geneva: UNAIDS; 2003.
7. Nachega JB, Hislop M, Dowdy DW, Chaisson RE, Regensberg L, Maartens G. Adherence to nonnucleoside reverse transcriptase inhibitor-based HIV therapy and virologic outcomes. Ann Intern Med 2007; 146: 564-73.
8. Arnsten JH, Demas PA, Farzadegan H, Grant RW, Gourevitch MN, Chang CJ, et al. Antiretroviral therapy adherence and viral suppression in HIV-infected drug users: comparison of self-report and electronic monitoring. Clin Infect Dis 2001; 33: 1417-23.

9. Holstad MK, Pace JC, De AK, Ura DR. Factors associated with adherence to antiretroviral therapy. J Assoc Nurses AIDS Care 2006; 17: 4-15.
10. Do NT, Phiri K, Bussmann H, Gaolathe T, Marlink RG, Wester CW. Psychosocial factors affecting medication adherence among HIV-1 infected adults receiving combination antiretroviral therapy (cART) in Botswana. AIDS Res Hum Retroviruses 2010; 26: 685-91.
11. Protopopescu C, Raffi F, Roux P, Reynes J, Dellamonica P, Spire B, et al. Factors associated with non-adherence to long-term highly active antiretroviral therapy: a 10 year follow-up analysis with correction for the bias induced by missing data. J Antimicrob Chemother 2009; 64: 599-606.
12. Bhat VG, Ramburuth M, Singh M, Titi O, Antony AP, Chiya L, et al. Factors associated with poor adherence to anti-retroviral therapy in patients attending a rural health centre in South Africa. Eur J Clin Microbiol Infect Dis 2010; 29: 947-53.
13. Uzochukwu BS, Onwujekwe OE, Onoka AC, Okoli C, Uguru NP, Chukwuogo OI. Determinants of non-adherence to subsidized anti-retroviral treatment in southeast Nigeria. Health Policy Plan 2009; 24: 189-96.
14. Johnson MO, Chesney MA, Goldstein RB, Remien RH, Catz S, Gore-Felton C, et al. Positive provider interactions, adherence self-efficacy, and adherence to antiretroviral medications among HIV-infected adults: A mediation model. AIDS Patient Care STDS 2006; 20: 258-68.
15. Johnson MO, Charlebois E, Morin SF, Catz SL, Goldstein RB, Remien RH, et al. Perceived adverse effects of antiretroviral therapy. J Pain Symptom Manage 2005; 29: 193-205.
16. Safren SA, Otto MW, Worth JL, Salomon E, Johnson W, Mayer K, et al. Two strategies to increase adherence to HIV antiretroviral medication: life-steps and medication monitoring. Behav Res Ther 2001; 39: 1151-62.
17. Patient Profile Section, Taksin Hospital. Annual report 2006-2008. Bangkok: Taksin Hospital; 2009. (in Thai).
18. Pharmacy Section, Taksin Hospital. ARV therapy record. Bangkok: Taksin Hospital; 2008. (in Thai).
19. Green LW, Kreuter MW. Health promoting planning: an educational and ecological approach. 3rd ed. California: Mayfield Publishing; 1999.
20. Carey MP, Morrison-Beedy D, Johnson BT. The HIV-knowledge questionnaire: development and evaluation of a reliable, valid and practical self-administered questionnaire. AIDS Behav 1997; 1: 61-75.
21. Tardy CH. Social support measurement. Am J Community Psychol 1985; 13: 187-202.
22. Monreal MT, da Cunha RV, Trinca LA. Compliance to antiretroviral medication as reported by AIDS patients assisted at the University Hospital of the Federal University of Mato Grosso do Sul. Braz J Infect Dis 2002; 6: 8-14.
23. Gonzalez JS, Penedo FJ, Antoni MH, Duran RE, McPherson-Baker S, Ironson G, et al. Social support, positive states of mind, and HIV treatment adherence in men and women living with HIV/AIDS. Health Psychol 2004; 23: 413-8.
24. Amberbir A, Woldemichael K, Getachew S, Girma B, Deribe K. Predictors of adherence to antiretroviral therapy among HIV-infected persons: a prospective study in Southwest Ethiopia. BMC Public Health 2008; 8: 265.
25. Erah PO, Arute JE. Adherence of HIV/AIDS patients to antiretroviral therapy in a tertiary health facility in Benin City. African J Pharm Pharmacol 2008; 2: 145-52.
26. Han N, Phoolcharoen W, Perngparn U. Anti-retroviral drug taking in HIV positive among Myanmar migrants in central area of Thailand. J Health Res 2009; 23 (Suppl): 33-6.
27. Potchoo Y, Tchamdja K, Balogou A, Pitche VP, Guissou IP, Kassang EK. Knowledge and adherence to antiretroviral therapy among adult people living with HIV/AIDS treated in the health care centers of the association "Espoir Vie Togo" in Togo, West Africa. BMC Clin Pharmacol 2010; 10: 11.

ปัจจัยคาดทำนายการรับประทานยาต้านไวรัสอย่างต่อเนื่องของผู้ป่วยเอดส์ที่มารับบริการ ณ โรงพยาบาลตากสิน กรุงเทพมหานคร

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***วัตถุประสงค์**: การวิจัยเชิงสำรวจภาคตัดขวางเพื่อศึกษาปัจจัยคาดทำนายการรับประทานยาต้านไวรัสอย่างต่อเนื่องของผู้ป่วยเอดส์ที่มารับบริการ ณ คลินิกตะวันใหม่ โรงพยาบาลตากสิน กรุงเทพมหานคร*

***วัสดุและวิธีการ**: กลุ่มตัวอย่างเป็นผู้ป่วยเอดส์จำนวน 230 ราย คัดเลือกโดยสุ่มตามคิวผู้มารับบริการ เก็บรวบรวมข้อมูลโดยใช้แบบสัมภาษณ์ ระหว่างวันที่ 1 กรกฎาคม ถึง 30 กันยายน พ.ศ. 2552 วิเคราะห์ข้อมูลโดยใช้ความถี่ ร้อยละ ส่วนเบี่ยงเบนมาตรฐาน ค่าสัมประสิทธิ์สหสัมพันธ์แบบเพียร์สัน และการวิเคราะห์การถดถอยพหุคูณแบบมีขั้นตอน*

***ผลการศึกษา**: ร้อยละ 61.8 ของกลุ่มตัวอย่างรับประทายยาต้านไวรัสอย่างต่อเนื่องอยู่ในระดับดี ปัจจัยคาดทำนายอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$) ต่อการรับประทานยาอย่างต่อเนื่องได้แก่ แรงสนับสนุนทางสังคมจากครอบครัว การรับรู้ต่อความรุนแรงของโรคและผลข้างเคียงของการรับประทานยาต้านไวรัส ความรู้เรื่องเอชไอวี/เอดส์ และการรักษาด้วยยาต้านไวรัส ปัจจัยทั้งหมดสามารถร่วมกันคาดทำนายการรับประทานยาต้านไวรัสอย่างต่อเนื่องได้ถูกต้องร้อยละ 26.8*

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