Study of determinants of Adherence to Antiretroviral Treatment among HIV Patients covered by Ahwaz Jundishapur University of Medical Sciences

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ABSTRACT

Adherence to antiretroviral therapy is essential for achieving durable clinical outcomes in patients with HIV. In addition, suboptimal adherence can accelerate development of drug-resistant HIV and mitigate HAART's role in reducing HIV incidence and transmission. The present research has been conducted to study treatment adherence and determine its effective factors on HIV/AIDS patients with the support of Ahvaz JundiShapur University of Medical Sciences in 2015. This is a cross-sectional study in which 158 HIV/AIDS patients who had been registered in the counseling centers of behavioral diseases of Ahvaz and were receiving antiretroviral treatment. They had been selected by census method. Data were collected using the AACTG (Adult Aids Clinical Trials Group) questionnaire. The collected data was analyzed and interpreted using descriptive statistical tests, χ^2 and step by step regression by spss-16 software. The mean age of patients was 32.8 ± 10.36. Among them 20.8% were female, 47.5% were single and 35.6% had a job. Also 33.7% of the respondents had CD4+ cell count less than 350 cells/μL. and average treatment duration was 9 months at study entry. According to the findings of this study, the degree of adherence was reported as % 63.9.The main reasons for non-adherence were forgetfulness (26%) and side effects (19%). There were no significant differences between highly adherent and less adherent patients with regard to age, gender, education Employment status, Treatment duration, time of diagnosis. Adherence to HAART is a key factor in disease course in persons with HIV/AIDS. Low-level adherence in subjects of the study indicated that educational and intervention is quite necessary for patients in order to improve their medication self-management.

Keywords: Adherence, HIV/AIDS, Antiretroviral therapy
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INTRODUCTION

Today, AIDS (Acquired Immune Deficiency Syndrome) is thought of as a crisis and health problem all over the world [1]. This disease is considered as the sixth cause of death in the world [2]. Regarding social economy, the disease has had destructive effects on world community [3], so that it has been counted as one of the main obstacles for development and has involved many people from active and productive population. The importance of AIDS is

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so much that no other problem has attracted the interest of international society [4,5]. Based on statistics in Iran, over 30,000 HIV-positive cases were identified and registered by the end of 2015, of whom 85 percent are men and 15 percent are women. Totally, 55 percent of the patients have been identified in the age group of 21 to 35 [6]. Modern advancements in treating AIDS, has shifted the disease classification from a death factor to a chronic one. Vast antiretroviral treatments have helped the patients to live a longer life of a high quality [7]. Highly active antiretroviral therapy（HAART）has decreased the death toll of HIV significantly [8].HAART is considered as a world standard care in treating HIV infection and refers to a treatment which reduces HIV-RNA to an undetectable level. This procedure begins with increasing CD4 cells which result to delay the progression to AIDS significantly. Since HAART treatment is a lifelong treatment [9], the key to its success is HIV patient's desire and their adherence to the combined antiretroviral treatment [10]. In the meantime, low adherence and medicine misuse leads to drug resistance. Patients who have followed their medication timely with right doses of medicines in less than %95 of cases, receive a weak virology and immunologic response and a level of adherence greater than 95% is necessary to achieve full viral suppression. Weak adherence not only reduces treatment effects but also threatens health through emergence of viruses which are resistant to several drugs. These resistant viruses can pass from person to person and limit treatment options for patients [11-13].Then, the successful results of the treatment, to a large extent, depends on adherence to treatment [14]. Although there is no gold standard test to assess the adherence to antiretroviral treatment, there are some different ways to do which include: self-report, pill count, electronic medication monitor, pharmacy claims, weighing bottles of drugs, plasma concentration of drug, pharmacy records, visual analogue scale, and progression towards AIDS [15]. There are some limited information on adherence to antiretroviral treatment which have reported different levels of adherence in Iran. The present research has been conducted to study treatment adherence and determine its effective factors on HIV/AIDS patients with the support of Ahvaz JundiShapur University of Medical Sciences in 2015.

MATERIALS AND METHODS

The present research was a cross-sectional study conducted in 2015. The subjects were 158 HIV/AIDS patients over 15 years of age who had been registered in the counseling centers of behavioral diseases of Ahvaz and were receiving antiretroviral treatment. They had been selected by census method to enter the study. The criteria for entering the study included the following: desire to enter the study, being at least 15 years old, and receiving treatment for at least six months. The criteria for excluding patients were having severe psychological and cognitive problems including mental retardation and dementia resulting from AIDS. The self-report method was used to gather the data for the purpose of this study. Researchers have claimed that self-report is potentially one of the best measures for assessing the level of patient's adherence because it is only the patient himself or herself who can give a true record. In fact, patient's self-report is the most possible way of assessment for clinical application. Using self-report, there are different ways like questionnaires, diaries, or interviews for assessing the level of patient's adherence to the treatment. In self-report method, the level of adherence is defined as dividing the pill number the patient has really used on the pill number the patient must have used, multiplied by a hundred [16]. An adherent patient is defined as one who takes> 95% of the prescribed doses [17].In this study patients who reported taking ≥ 95% of the prescribed doses were represented adherent, those with a reported intake of <95% were classified as non-adherent. The tool for gathering the data in this research was a two-part questionnaire. The first part included demographic questions (like age, sex, marriage status, education, job, life situation, transmission route, time of beginning treatment, diagnosis time length, having simultaneous disease, CD4counts), and part two included the tools of standard AACTG self-report (Adult Aids Clinical Trials Group) which is widely used in the world. The questionnaire assesses HIV/AIDS patients' adherence to treatment by 4 questions regarding the way patients use medicines (never=0, some=1, half=2, most=3, all of the time=4) with a range between 0-16 in which higher score indicated higher adherence. Also, to investigate effective factors for adherence, the following questions were posed: 14 questions on not following the treatment (never=0, rarely=1, sometimes=2, often=3), 20 questions on the side-effects of the medicines (never=0, very little=1, little=2, much=3, very much=4), 4 questions on enjoying social support (yes=1, no=0), and 3 questions on having risky behaviors (yes=1, no=0). The questionnaire was translated to Persian and was validated through validity method. The reliability of the questionnaire was obtained by using Cronbach's Alpha %81. The collected data was analyzed and interpreted using descriptive statistical tests, χ^2(Chi-squared) and step by step regression by spss-16 software. Statistical significance was considered at p-value <0.05.

RESULTS

Totally, 158 patients participated in the research of whom %20.8 were women, %47.5 were single, and %64.4 were unemployed. The average age of the subjects was 38.2±10.36 with the range of 19-69. Around 45% of the participants were between 30-39 years of age. Only %1 of the patients had academic education and most of them (%63.3) had a literacy level of less than diploma. In all, %74 of the respondents had been under medication for two years. Almost all of the participants (%94.1) were living with their family and friends. Regarding Nucleic acid, %44.6 of the patients were diagnosed as the carrier of hepatitis C virus. Regarding the number of CD4 cells, %33.7 percent of the respondents had CD4 less than 350. The time for HIV diagnosis was less than five years for %71.3 of the subjects.

Table 1: Demographic and clinical characteristics of the study participants

variable	Adherence n (%)	Non-adherence n (%)	Total	P value
Age, y				0.800
Less than 30	23(22.8)	16(28.1)	39(24.7)	
30-39	45(44.6)	23(40.4)	68(43)	
40-49	17(16.8)	11(19.3)	28(17.7)	
Over 50	17(15.8)	7(12.3)	23(14.6)	
Gender				1.0
Male	80(79.2)	45(78.9)	125(79.1)	
Female	21(20.8)	12(21.1)	33(20.9)	
Education				0.173
Illiterate	6(5.9)	1(1.8)	7(4.4)	
Less than diploma	64(63.3)	44(77.2)	108(68.4)	
Diploma	30(29.7)	10(17.5)	40(25.3)	
Academic	1(1)	2(3.5)	3(1.9)	
Marital Status				0.030
Single	48(47.5)	38(66.7)	86(54.4)	
Married	53(52.5)	19(33.3)	72(45.6)	
Employment status				0.72
Employed	36(35.6)	12(21.1)	48(30.4)	
Unemployed	65(64.4)	45(78.9)	110(69.6)	
Transmission route				0.161
Injecting drugs	60(59.4)	30(52.6)	90(57)	
unsafe sex	35(34.7)	25(43.9)	60(38)	
Blood and blood products	1(1)	2(3.5)	3(1.9)	
Others	5(5)	0(0)	5(3.2)	
The time of diagnosis				0.883
Less than 5 years	72(71.3)	40(70.2)	112(70.9)	
Over 5 years	29(28.7)	17(29.8)	46(29.1)	
Treatment duration				0.852
Less than two years	75(74.3)	41(71.9)	116(73.4)	
More than two years	26(25.7)	16(28.1)	42(26.6)	
Simultaneous infection				0.685
Hepatitis C	45(44.6)	28(49.1)	73(46.2)	
Hepatitis B	1(1)	5(8.83)	6(3.79)	
CD4				0.008
350 and above	67(66.3)	49(86)	116(73.4)	
Less than 350	34(33.7)	8(14)	42(26.6)	
Support from family/friends				0.009
yes	70(69.3)	27(47.4)	97(61.4)	
No	31(30.7)	30(52.6)	61(38.6)	
Life situation				0.028
With family	95(94.1)	47(82.5)	142(89.9)	
Alone	6(5.9)	10(17.5)	16(10.1)	

The results showed a statistically significant relation between adherence to treatment and marital status (p=0.03), enjoying family or friend support (p=0.009), life status (p=0.0028), and the average number of CD4 cells (p=0.008). However, there is no statistically significant relation between adherence to treatment and age (p=0.80), sex(p=10), education (p=0.825), infection accompanying HIV (p=0.685) (Table 1). Risky behaviors had also significant relation with adherence to treatment(p=0.05) which was showed in Table 2.All the patients reported that they had experienced one or several cases of drugs side-effects. The side-effects most frequently reported were dizziness

(%60.8), tiredness and weakness (%56.3) (Table 3). The most important reasons reported for taking the medicines incorrectly were forgetting (%26.3) and drugs side-effects (%19) (Figure 1).Based on regression test, there was statistically significant relation between variables of drug side-effects (p<0.001), risky behaviors (p=0.003), family and friends support (p=0.003) and adherence to treatment (Table4).

Table 2: Frequency distribution of risky behaviors in the participants according to their adherence to treatment

Variable	Adherence n (%)	Non-adherence n (%)	Total	P value
Drug Use				0.000
yes	6(5.9)	17(29.8)	23(14.6)	
No	95(94.1)	40(70.2)	135(85.4)	
Alcohol Use				0.036
Yes	3(3)	7(12.3)	10(6.3)	
No	98(97)	50(87.7)	148(93.7)	
Having unprotected sex				0.028
Yes	6(5.9)	7(12.3)	13(8.2)	
No	95(94.1)	50(87.7)	145(91.8)	

Table 3: Frequency distribution of drug side effects in the subjects

Side Effect	No.(%)	Side Effect	No.(%)
Dizziness	96(60.8)	Muscle aches	33(20.9)
Fatigue	89(56.3)	Skin problems	32(20.2)
Insomnia	71(45)	Pain and numbness in hand and foot	26(16.5)
Depression	64(40.5)	Diarrhea	24(15.2)
Headache	60(38)	Sex-desire decrease or impotence	17(10.8)
Loss of appetite	58(36.7)	Fever, shivering, and sweating	15(9.5)
Mood Changes, Anxiety	55(35)	Flatulence	13(8.2)
Nausea and Vomiting	51(32.3)	Hair loss	8(5)
Forgetfulness feeling	46(29.1)		

Table 4: Frequency distribution of drug side effects in the subjects

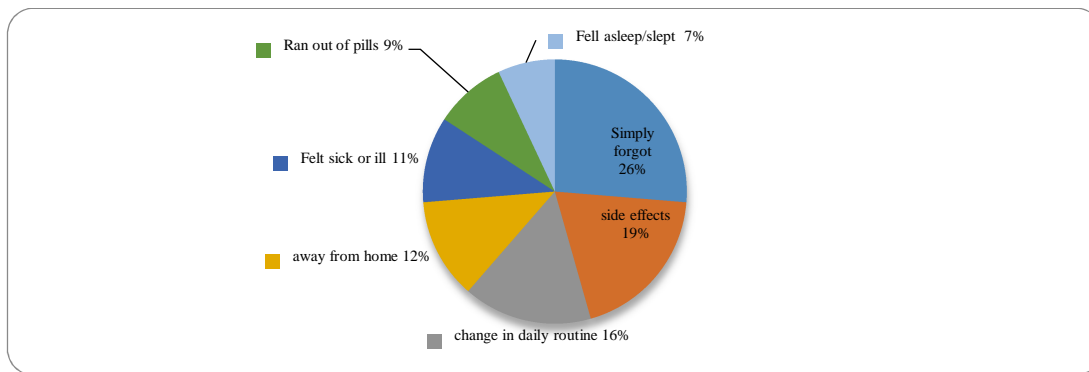| Variable	ß	Standard error	Standardizedß	t	p
Drugs side-effects	-14.195	3.971	-0.241	-3.575	0.000
Risky behaviors	-17.185	5.772	-0.208	-2.977	0.003
Family and friends support	9.475	3.119	0.205	3.039	0.003

Figure 1: Frequency distribution of causes of deviation from medication procedure in the participants

DISCUSSION

Most studies about adherence to HAART treatment define it as using medication more than %90 of their prescribed doses [18]. The results of the current study indicated that the level of adherence to treatment in HIV-infected patients was %63.9 which was a low level and which was similar to the studies conducted in Iran [18], Nigeria [19], India [20], Laos and Zambia [21]. However, compared with Sarna's [22], Tran's [23], Fung's [10], Arnstan's [24],

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and Xiaoqi Wang's [25] results, they showed a less favorable situation. There was no correlation between adherence to treatment and age or sex which corresponded to the studies conducted by Peltzer [26], Campbell [27], Mitiku [28], and Fong [10]. Also, we could not show any significant correlation between adherence to treatment and education which might be in the reason of homogeneityin the patients most patients were below diploma (%72.8). This confirms the results obtained by Cauldbeck [29], Paasche-Orlow [30], and Peltzer [26] which had demonstrated no relation between education and adherence. In this study, similar to the studies conducted by Sow [31] and Oku [32], job did not correspond to adherence to treatment which might be because HAART drugs and health care are free for HIV patients in Iran. Trif et al.[33] showed that marriage improves patients' adaptation with their disease. Enjoying spouse's protection is the most essential supportive source during illness period. Our study, indicated that there was a significant correlation between marriage and adherence to treatment so that married people showed more adherence than single ones. Other studies also confirm this result [31,34]. We could not detect any significant correlation between HIV diagnosis time and the beginning of HAART treatment time with adherence. To the result was in line with the studies of Fong [10] and Kleeberger [35]. Our study showed that co-infection HIV with HBV and HCV did not affect on the adherence. Co-infection HIV with HBV or HCV distribution was %49.99 and was reported in Moraadmand's and Badi's study [36]. This distribution varied from %1 to %20 in numerous studies (37-39). Co-infection HIV with HBV and HCV is one of HIV/AIDS patients' problems [40]. The importance of these infections is their common way of transference and the higher probability of liver dysfunction which can lead to their death [41]. Our results show that living with family and enjoying family and friends support correlate significantly with adherence to treatment. Schwarts et al.[42] in their study have also, showed that patients who lived alone had received the least support from their family. Mills[43]believed that patients who keep their HIV infection hidden from their family and friends, more often stop their treatment since they have to use their drugs secretly. As WHO [44] emphasizes, social and psychological protection on the part of family and friends can lead to HIV patient's better adaptation to their disease and encourage them for treatment. In the present study, a significant correlation was found between patients' risky behaviors and their adherence to treatment. This finding matched with Arnestan's findings [24]. The most important factor for deterioration of HIV patients' situation and its contagion was their risky behavior [44]. Risky behaviors, in this study, included using narcotics, drinking alcohol, and having unprotected sex. In this study, the most frequent side effects of medicines were dizziness, tiredness and weakness, insomnia and depression. Habtamu Mitiku et al.[28] reported tiredness, weakness, pain, numbness and headache among the most frequent side effects. In treating HIV patients, not only using medicines but also using them timely and following physician's instructions are important [16]. Our results indicate that forgetting is the most frequent reason for the subjects' deviation from their medication. Belay Dagnaw Bitew [45] and Habtamu Mitiku [28] obtained similar results. One of the limitations of the present study was the way the patients reported their level of adherence to treatment. Although the patients were assured that the results did not affect the procedure of medication services for them, they might have reported the level of their treatment somewhat higher.

CONCLUSION

Since many factors are involved in adherence to treatment on the part of the patients, proper educational strategies and necessary interventions should be designed in order to promote their life style and improve their ability to take care of themselves. This research mainly focused on effective personal factors for adherence to treatment but designing other researches, especially qualitative studies could involve both patients and staff who offer the health care services.

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