

Effect of Perceived Side-effects on Treatment Adherence Among PLHIVs of A Tertiary Hospital in Kolkata

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Abstract

Background: For general well-being and longer survival, maintaining over 95% adherence to ART is necessary. It also reduces the chance of resistance development. But side-effects from ART may lead to reduced compliance. We conducted this study with the objective of assessing effect of perceived side-effects of ART on treatment adherence in patients on ART in a tertiary hospital in Kolkata, India. *Methods:* An observational, cross-sectional study was conducted on the adults attending ART centre of R. G. Kar Medical College, Kolkata. Patients above 15 years of age, who received at least one year of treatment before the study, comprised the study population. Sample size was 279. We tried to determine any association between adherence level and perceived side-effects applying suitable statistical tests. Data were analysed using IBM SPSS (version 20). *Results:* Compared to patients with correct knowledge about side-effects of ART, those who have incorrect knowledge had 0.325 times higher chance of having inadequate adherence in last one year ($p=0.04$). Chi-square test shows significant association between perceived side-effect encountered during the course of treatment and adherence level of patients on ART ($p=.001$). *Conclusion:* The subjects, who knew ART may cause side-effects, in case of any adverse health situation as perceived by them as side-effects from ART, may discontinue the medication, leading to reduced adherence level. On the other hand, those who didn't know ART may cause side-effects, will not attribute any adverse health situation to ART, and will not discontinue the medications, keeping adequate adherence level.

Keywords: Antiretroviral Therapy; Adherence Level; HIV/AIDS; Side-Effects.

Introduction

Adherence to therapy can be defined as the patient's ability to follow the treatment regimen, to take medications at prescribed frequency and time, and also to follow restrictions in food and other drug intake [1]. World Health Organization has recommended at least 95% adherence to 1st line antiretroviral drugs (ARVs) for effective control of HIV infection among the people living with HIV/AIDS (PLHIVs) [2]. Adverse effects have

been reported with all antiretroviral drugs and are among the most common reasons for switching or discontinuing therapy and for medication non-adherence. The commonly reported side-effects from ARVs are anaemia, liver damage, skin rashes, nausea, vomiting, abdominal pain, diarrhoea, dizziness, vertigo, insomnia, headache etc. [3]. Without proper indication discontinuation of antiretroviral therapy (ART) can lead to decreased adherence, which in turn may affect the general well-being and life expectancy among the PLHIVs. With this context, our study was conducted with the objective to determine the association between perceived side-effects from ART and treatment adherence level among the adults receiving ART in a tertiary health care centre namely R. G. Kar Medical College and Hospital, Kolkata, West Bengal, India.

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Materials and Methods

An observational, cross-sectional study on the adults receiving treatment at the ART centre of R. G. Kar Medical College, Kolkata, was conducted in 2014. Patients aged 15 years or above, who had given consent and received antiretroviral therapy for at least one year were considered as the study subjects. Sampling frame was all the patients fulfilling the inclusion criteria who received at least 1 year of ART before the study. Different studies have shown difference in prevalence of adequate ($\geq 95\%$) adherence to antiretroviral therapy in India. A study conducted by Shah et al. showed 73% patients maintained adequate adherence considering 95% adherence as the cut off value for adequate adherence as mentioned by WHO [4]. So, prevalence of patients with adequate adherence was considered to be 73%. Using the formula, minimum sample size (n) = $z^2 * p (100-p) / d^2$ [where, n = minimum sample size; z = 1.96 for 95% confidence interval (CI); p = prevalence of patients with adequate ($\geq 95\%$) adherence; d = absolute precision, taken as 5%], the sample size (n), as obtained, was 303. The sample size (n = 303) was more than 10% of the total population (N = 2021). So, using the finite population correction, the corrected minimum sample size (nc) was $N*n/(N+n)$ i.e. 264. Simple random sampling had been used on everyday visit to ART Centre for data collection. Sampling was done till the last week of the last month of the interview and a total of 279 patients were interviewed for the study. Each study subject was briefed about the purpose of the study. The subjects were assured of confidentiality and an informed consent was sought from each of them before initiating the interview. Permission was obtained from Ethical Committee of R.G. Kar Medical College and hospital, and West Bengal State AIDS Prevention and Control Society (WBSAP & CS). The ART adherence for a patient was measured at every monthly visit using the following formula [5].

$$\text{Adherence} = \frac{\text{No. of tablets the patient had consumed in a given duration}}{\text{No. of tablets the patient should have consumed in the same duration}} \times 100\%$$

The adherence levels were classified as adequate ($\geq 95\%$) and inadequate or poor ($< 95\%$). For measuring the adherence level in last one year, the minimum level of adherence in last twelve months was considered, rather than taking the average value, as it would 'dilute' the result. Data were collected by review of treatment card of individual

patients, followed by interview using a pretested schedule. Information regarding socio-demographic profile, treatment details, perceived side effects etc. was also obtained. Subjects were asked about their knowledge of side effects from the ART, also about their perceived side effects and the reasons behind the missing doses. IBM SPSS (version 20.0) was used for appropriate statistical analysis.

Results

Table 1 reveals the socio-demographic profile of the study subjects. Among the study subjects, almost 70.9% were male. Majority of the study subjects were in the 25-34 years and 35-44 years age group, which is the most active years for sexual activities. Hindus comprise the majority of the study subjects (87.8%). Majority (83.9%) use Bengali as the language of communication. Almost 73% subjects were married at the time of the interview. Education level of majority of the subjects was of poor level, with 30.8% illiterates and 31.5% completing up to primary education only. This study also reveals most of the study subjects were from poor socioeconomic status, having 42.3% in class I and 22.9% in class V of B G Prasad scale (2013 modification). About 69.9% of the patients were employed at the time of interview. Among the study subjects, most of them were coming from Kolkata (45.2%) and North 24 Parganas (39.6%), followed by South 24 Parganas (2.2%), Nadia (9.7%), Howrah (1.4%) and Hooghly (4.7%) districts of West Bengal.

In last one year, 262 patients had adherence of 95% or more i.e. adequate adherence. The rest 17 patients (6.1%) had inadequate adherence to antiretroviral therapy [Table 2].

Table 3 shows about 45.2% subjects had correct knowledge regarding occurrence of side effects from antiretroviral therapy. Binary logistic regression shows compared to patients with correct knowledge about side-effects of antiretroviral drugs, those who have incorrect knowledge have 0.325 times higher chance of having inadequate adherence in last one year, which is statistically significant ($p=0.04$).

Eighty four patients (30.1%) perceived one or more side-effects from ART during the course of treatment. Chi-square test shows significant association between perceived side-effect encountered during the course of treatment and adherence level of patients on ART ($p=.001$) [Table 4]. Binary logistic regression shows as compared to subjects with correct knowledge of

side-effects on ART, those with incorrect knowledge had 20.065 times more chance of not perceiving any side-effect from the treatment and the finding was statistically significant ($p < 0.001$) [Table 5].

The most common system involved is gastrointestinal system, followed by both gastrointestinal and dermatological system [Figure 1]. The most common side-effect is nausea followed by vomiting. Other common side-effects

involve dermatological system (rash and itching) [Figure 2].

Table 6 shows the most common reasons, as stated by the subject, for missing of doses in last one year were because of side effects from the medication (34.2%) and because they forgot to take the medicine (34.2%).

Table 1: Distribution of study subjects according to sociodemographic variable (N=279)

Variables	Frequency (%)
<i>Sex:</i>	
Male	198 (70.9%)
Female	81 (29.1%)
<i>Age (year):</i>	
15-24	11 (3.9%)
25-34	106 (38.0%)
35-44	116 (41.6%)
45-54	40 (14.3%)
55-64	6 (2.2%)
<i>Religion:</i>	
Hindu	245 (87.8%)
Muslim	34 (12.2%)
<i>Language of communication:</i>	
Bengali	234 (83.9%)
Hindi	45 (16.1%)
<i>Education:</i>	
Illiterate	86 (30.8%)
Primary school	88 (31.5%)
Middle school	49 (17.6%)
Secondary school	15 (5.4%)
Higher secondary	20 (7.1%)
College or above	21 (7.5%)
<i>Socioeconomic status (Modified B G Prasad's Scale, 2013):</i>	
I	13 (4.7%)
II	36 (12.9%)
III	48 (17.2%)
IV	118 (42.3%)
V	64 (22.9%)
<i>Marital status:</i>	
Single	45 (16.1%)
Married	204 (73.1%)
Divorced/separated	12 (4.3%)
Widowed	18 (6.5%)
<i>Current employment status:</i>	
Employed	195 (69.9%)
unemployed	84 (30.1%)
<i>Residence (district):</i>	
Kolkata	126 (45.2%)
24 Parganas (North)	103 (39.6%)
24 Parganas (South)	6 (2.2%)
Nadia	27 (9.7%)
Howrah	4 (1.4%)
Hooghly	13 (4.7%)

Table 2: Distribution of study subjects according to level of adherence in last one year (N=279)

Level of adherence	Number of patients	Percentage
Adequate	262	93.9
Inadequate	17	6.1
Total	279	100.0

Table 3: Association between knowledge about side-effects from ART and adherence level of study subjects in last one year (N=279).

Knowledge about S/E of ART	Adherence		Total (%)	Exp(B)	95% C.I		p value
	Adequate	Inadequate			Lower	Upper	
Correct	114 (40.9%)	12 (4.3%)	126 (45.2%)				.121
Incorrect	146 (52.3%)	5 (1.8%)	151 (54.1%)	.325	.111	.950	.040
No knowledge	2 (0.7%)	0 (0.0%)	2 (0.7%)	.000	.000	-	.999
Total	262 (93.9%)	17 (6.1%)	279 (100.0%)				

Figure in the parenthesis are expressed as percentage

Table 4: Association between perceived side-effect and adherence level of study subjects in last one year (N=279).

Perceived side-effects	Adherence		Total (%)	Chi-square value	df	p value
	Adequate	Inadequate				
Yes	73 (26.2%)	11 (3.9%)	84 (30.1%)			
No	189 (67.7%)	6 (2.2%)	195 (69.9%)	10.298	1	.001
Total	262 (93.9%)	17 (6.1%)	279 (100.0%)			

Figure in the parenthesis are expressed as percentage

Table 5: Distribution of study subjects according to knowledge about side-effects and perceived side-effects (N=279).

Knowledge about S/E of ART	Perceived side-effects		Total (%)	Exp(B)	95% C.I		p value
	Yes	No			Lower	Upper	
Correct	74 (26.5%)	52 (18.6%)	126 (45.2%)				.000
Incorrect	10 (3.6%)	141 (50.5%)	151 (54.1%)	20.065	9.641	41.79	.040
No knowledge	0 (0.0%)	2 (0.7%)	2 (0.7%)	2298944999	.000	-	.999
Total	84 (30.1%)	195 (69.9%)	279 (100.0%)				

Table 6: Distribution of patients receiving ART depending on stated reason of missing dose(s) in last one year (N=73).

Stated reason for missed dose in last one year	Number of patients	Percentage
Forgot to take	25	34.2
Forgot to carry	10	13.7
Side-effects	25	34.2
Late to collect medicine	2	2.7
Unaware of missed dose	11	15.1
Total	73	100.0

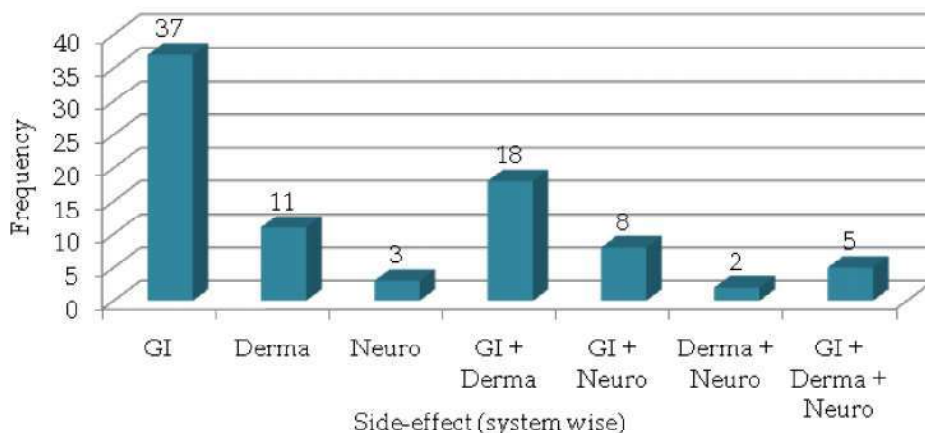


Fig.1: Bar diagram showing distribution of patients taking ART according to system wise side-effects (n=84).

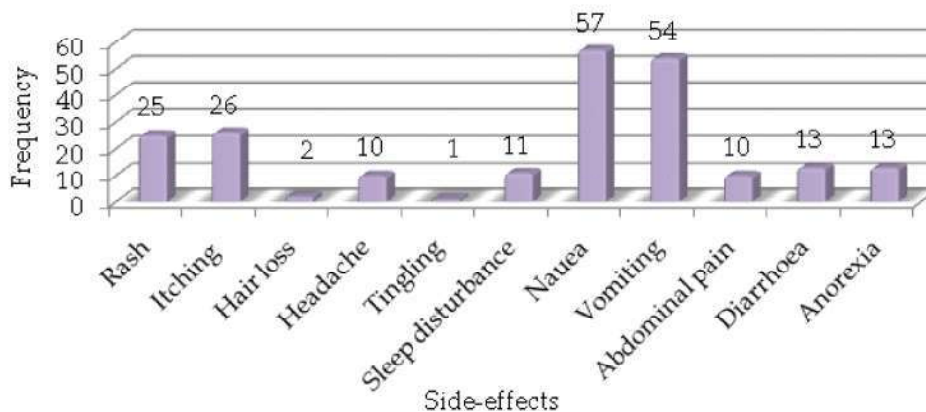


Fig. 2: Bar diagram showing distribution of patients taking ART according to the type of side-effects experienced (n=84).

Discussion

Our study revealed that compared to those with those with correct knowledge on side effects from ART, those who had incorrect knowledge had 0.325 times higher chance of having inadequate adherence, and the finding was statistically significant (OR = 0.325, 95% CI = 0.111 - 0.950, P = 0.04)[Table 3]. Thus apparently incorrect knowledge was found to be a protective factor in developing inadequate adherence. The probable explanation may be since some of the study subjects know ART causes side-effects, in case of any adverse health situation (nausea, vomiting etc.) as perceived by them as side-effects from ART, some of these patients may discontinue the medication, leading to fall in percentage adherence. On the other hand, those study subjects who did not know ART may cause side-effects, would not attribute any adverse health situation to ART, and will not discontinue the medications, keeping adequate adherence level. It also showed that incorrect knowledge about occurrence of side-effects from ART leads to 20.065 times more chance of not perceiving side-effects from ART as compared to those with correct knowledge [Table 5].

Though about 69.9% of patients didnot report on perceived side-effects from ART, it was found to be a factor significantly associated with inadequate adherence (Chi Square value= 10.298, df= 1, P= 0.001) [Table 4]. In case of any adverse reactions which were perceived by the study subjects as side-effects from the ART medications, may lead the patients to discontinue the drugs for and it resulted in fall in percentage adherence. In the study by Sarna et al., presence of moderate to severe side-effects were found to have higher risk of having

inadequate adherence compared to those with none to mild side-effects (OR= 5.40, 95% CI= 2.47-11.81, p= 0.000) [6]. In this study, the system found most commonly affected was gastro-intestinal system followed by dermatological system [Figure 1]. Nausea (57%) and vomiting (54%) being the most common side-effects, itching (26%) and rash (25%) are the next common side-effects [Figure 2]. On the contrary, study by Kumaraswamy et al. showed skin rash to be commonest side effects [7]. The most common system affected, as found in study by Sharma et al., was cutaneous [8].

Our study revealed the most common reasons for missed doses were either the patients forgot to take the medicine (34.2%) or they didn't take it due to fear from side-effects (34.2%) [Table 6]. Studies by Safren et al., Shah et al., Sharma et al., Wanchu et al., Sarna et al. revealed different reasons for non-adherence, like cost of medication, adverse events, patients ran out of tablet, patients were away from home, couldn't return to clinic/social stigma, busy with other things, forgot to take medicine etc [4,8,9,10].

Conclusion

Side-effects from antiretroviral therapy, even though not uncommon, are not absolute contraindications for the treatment. Therefore, if a patient perceives any adverse health condition during the course of ART, he should consult a physician for further advice instead of discontinuing the treatment on his own as it may lead to decreased adherence, drug resistance, and over all deterioration of the patient's health. Adequate counselling on probable side-effects of treatment should also be emphasized on, so as to

improve patient's compliance to therapy, and thus improving the general well-being. By bridging the communication gap between the beneficiaries and the service providers and addressing to the common doubts of the patients, we may ensure adequate adherence to antiretroviral therapy leading to improved survival and quality of life among the PLHIVs.

Figure 2. Bar diagram showing distribution of patients taking ART according to the type of side-effects experienced (n=84).

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