Adherence to Antiretroviral Therapy Among HIV-Positive Pregnant Women on followup at Mizan Tepi University Teaching and Tepi General Hospitals, Southwest Ethiopia

Temesgen Aferu1, Gatluak Doang2, Ameha Zewudie1, and Tadesse Nigussie1

Abstract

Background: The introduction of highly active antiretroviral therapy has not only improved longevity in human immunodeficiency virus (HIV)–infected individuals but in addition has had a significant impact on the rate of mother-to-child transmission of the infection. Objective: To assess antiretroviral therapy adherence among HIV-positive pregnant women on follow-up at antiretroviral therapy clinic of Mizan Tepi University Teaching and Tepi General Hospitals. Methods: A descriptive cross-sectional study was undertaken in antiretroviral therapy clinics of Mizan Tepi University Teaching and Tepi General Hospitals from April to May 2018. Data were collected through face to face interview using structured and pretested questionnaires and analyzed using Statistical Package for Social Sciences version 20. Results: Majority of the patients had good adherence to their antiretroviral therapy, 68 (66.00%). Medication side effects, 12 (34.00%) and forgetfulness and distance of the hospital from home, each accounting 11 (31.00%) were the main reasons for nonadherence among nonadherent patients. Frequency of counseling ($P = .000$), CD4 count ($\chi^2 = 37.529$, $P = .000$), World Health Organization’s clinical stage ($\chi^2 = 17.515$, $P = .000$), stigma ($\chi^2 = 70.426$, $P = .000$), and family support ($\chi^2 = 46.383$, $P = .000$) were found to be associated with patients’ medication adherence. Conclusion: The overall patient adherence to antiretroviral therapy in the study facilities was good. Collaborative work among patients, health care organizations, and the public are necessary to tackle the adherence obstacles and enhance patient adherence to the prescribed medication.

Keywords
Antiretroviral therapy, Adherence, HIV/AIDS, Pregnant women, Mizan Tepi University Teaching Hospital, Tepi, Ethiopia

Background

The introduction of highly active antiretroviral therapy (HAART) has not only improved longevity in human immunodeficiency virus (HIV) infected individuals but in addition has had a significant impact on the rate of mother-to-child transmission (MTCT) of the infection.1 The rates of MTCT of HIV infection has practically crashed to less than 2% following the introduction of HAART.2,3 However, the success of HAART, like any medication is dependent on both the intrinsic properties of the drugs and the individual’s ability to take the medication as prescribed. This is particularly true in the prevention of MTCT, where the consequence of failing to achieve viral suppression leads to transmission of the virus to the baby.4 Adequate adherence to the prescribed antiretroviral medications is essential to achieve maximal viral suppression necessary to prevent MTCT.5 Adherence rates exceeding 95% are necessary to maximize the benefits of antiretroviral therapy (ART). Higher levels of drug adherence are associated with improved virological, immunological, and clinical outcome5 while poor adherence can lead to suboptimal viral...
suppression, development of viral resistance, higher risk of MTCT, and mother-to-child transmission of resistant HIV strains. Interrupting medication permits the virus to resume rapid replication and as many as $10^{10}$ viral particles will be produced per day. This allows resistant mutant strains to be generated, which are no longer responsive to available anti-retroviral drugs, posing a public health danger. Even though great investment and increased access to prevention of mother-to-child transmission services by global health is underway to nullify HIV infection to children, MTCT still remains a global concern and achieving optimal adherence to ART among pregnant woman also remained a universal challenge. The same problem is happening in Ethiopia where HIV transmission from pregnant mother to child is high and data on ART adherence during pregnancy are limited. Only few published studies that addressed level of adherence to option B+ and factors affecting it are available and no previous studies conducted in the study settings on this issue. Therefore, the current study aimed at assessing HIV-positive pregnant mothers’ adherence to ART in Mizan Tepi University Teaching and Tepi General Hospitals.

**Methods**

**Study Setting**

The study was conducted at antiretroviral therapy clinics of Mizan Tepi University Teaching and Tepi General Hospitals, Southwest Ethiopia. These facilities are found 568 and 565 km away from Addis Ababa, capital city of Ethiopia, respectively. The ART clinic of Mizan Tepi University Teaching Hospital was established in 1986 while that of Tepi General Hospital was established in 1989. Both clinics provide prevention of mother-to-child transmission services in addition to adult and pediatric HIV/AIDS services.

**Study Design and Period**

A descriptive cross-sectional study was undertaken from April 17 to May 15, 2018.

**Source and Study Population**

All HIV-positive pregnant women on follow-up at the ART clinic in Mizan Tepi University Teaching and Tepi General Hospitals were the source population while all HIV positive pregnant women on follow-up at the ART clinic in the same hospitals during the study period who were 18 years of age and older and had no any mental problem were the study population.

**Sample Size Determination and Sampling Technique**

There was no sample size calculation made since the source population was small and therefore, consecutive sampling technique was used to include all patients who ever came during study period and fulfilled the inclusion criteria of the study.

**Data Collection Procedure**

Different literatures were referred to prepare tool used to measure adherence. The prepared tool was then pre-tested and applied to pregnant mothers on ART follow-up through exit interview.

**Data Processing and Analysis**

The collected data were checked for consistency and completeness of information and analyzed using SPSS version 20. The relationship between dependent variable (patient medication adherence) and selected independent variables was examined using chi-square test. Then the final result of the analysis was presented using tables and descriptions.

**Data Quality Assurance**

To assure quality of the data, pretest was done on 5% of the sample population. The collected data were also checked daily for completeness, clarity, and logical consistency.

**Operational Definitions**

Good adherence: At least 95% consumption of ARTs in the past 3 months (with a maximum of 1 skipped dose a week).

Poor adherence: Less than 95% consumption of ARTs in the past 3 months (with 2 or more skipped doses a week).

**Results**

**Sociodemographic Characteristics of the Respondents**

A total of 103 pregnant women on ART follow-up at Mizan Tepi University Teaching and Tepi General Hospitals were interviewed regarding their ART adherence. The mean age and body mass index of these patients were 27.60 ± 5.53 years and 20.05 ± 2.16 kg/m², respectively. Many of the study participants were Sheka and Oromo in ethnicity accounting for 35 (34.00%) and 25 (24.30%), respectively. Concerning residence, 61 (59.20%) of the respondents lived in urban area and 42 (40.80%) were rural residents. Majority of the study participants were Muslims and protestants by religion accounting 40 (39.00%) each. Significant proportion of the respondents were married, 101 (98.00%) and had primary education, 64 (62.00%). Forty-seven (46.00%) of the respondents were housewives while 37 (36%) were merchants by occupation. Regarding pregnancy, 81 (79.00%) of the study participants were in gestational age of less than 5 months and many of the patients, 49 (48.00%), were on their third antenatal care visit (Table 1).
Clinical Factors Related to Respondents

Majority of the patients had a CD4 cell count of >350 (82, 80.00%) and were in the WHO clinical stage II and above (59, 57.20%). Forty-nine (48.00%) participants were on the third antenatal care visit. Many had experienced opportunistic infection (91, 88.30%) (Table 2).

ART Adherence Level of the Patients

As can be seen in Table 3, majority of the patients had good adherence to their ART medications, 68 (66.00%). Of the total patients having poor adherence, 12 (34.00%) stated that they failed to adhere to their medication because of the side effects they got from the pills. Forgetfulness and distance of the hospital from their home were also the main reasons for patients’ nonadherence, each accounting 11 (31.00%) (Table 3).

Factors Associated With Medication Adherence

Analysis of medication adherence by selected independent variables indicated that patients’ frequency of counseling was associated with adherence ($P = .000$). Patients who received counseling frequently were more likely adherent to their medication than those who did not. Patients who had greater than 350 CD4 cells were more likely to exercise overall good adherence practices than patients having 350 and less CD4 cells ($\chi^2 = 37.529, P = .000$). It was also found that WHO clinical staging criteria were associated with adherence. As can be seen in Table 4, patients who were in the clinical stage I (asymptomatic stage) were more likely to exercise good adherence when compared with patients who were in clinical stage II and greater ($\chi^2 = 17.515, P = .000$). There was an association between overall MMAS (Morisky Medication Adherence Scale) score in terms of mark of disgrace (stigma) associated with being HIV positive. Patients who did not experience stigma were more likely to exercise good adherence when compared with patients who experienced stigma associated with their HIV status ($\chi^2 = 70.426, P = .000$). Family support was also associated with adherence. Patients who had good family support were more likely adherent than those patients who had no family support ($\chi^2 = 46.383, P = .000$) (Table 4).

Discussion

Adherence to ART among HIV positive pregnant women varies from place to place based on different factors and the current study assessed this issue in selected facilities in Southwest Ethiopia. As to this study, good adherence was achieved by 68 (66.00%) respondents. This level of adherence is comparable to a study conducted in Ukraine, which revealed an adherence level of 65%.$^{15}$ But it is higher than the finding of studies conducted in Kyela District, Tanzania and Addis Ababa, Ethiopia that reported 50% and 61% adherence level, respectively.$^{16,17}$ The higher result in the current study might be because of differences in patient understanding of the importance of the adherence to medications and strength of adherence promoting activities done in the facilities. Facilities in the current study might have performed more in strengthening adherence and hence better patients understanding of medication adherence. On the other hand, the overall adherence level of this study is by far less than results reported by the studies conducted in Tigray regional state (87.1%) and western Kenya (89%).$^{14,18}$ This might be related to women’s lower educational status, which affects understanding level of the importance of adherence. Many study respondents in the current study had

Table 1. Sociodemographic Characteristics of HIV-Positive Pregnant Women on Follow-up at the Antiretroviral Therapy Clinic of Mizan Tepi University Teaching and Tepi General Hospitals, 2018 (N = 103).

| Sociodemographic Profile | Frequency (%) |
|--------------------------|--------------|
| Marital status           |              |
| Married                  | 101 (98.05)  |
| Divorced                 | 1 (1.00)     |
| Widowed                  | 1 (1.00)     |
| Ethnicity                |              |
| Bench                    | 10 (10.00)   |
| Oromo                    | 25 (24.27)   |
| Amhara                   | 9 (9.00)     |
| Maji                     | 2 (2.00)     |
| Sheka                    | 35 (34.00)   |
| Others $^a$              | 22 (21.00)   |
| Educational status       |              |
| Cannot read and write    | 26 (25.00)   |
| Primary (grades 1-8)     | 64 (62.00)   |
| Secondary (grades 9-12)  | 7 (7.00)     |
| College/University       | 6 (6.00)     |
| Occupation               |              |
| Farmer                   | 12 (12.00)   |
| Government employee      | 7 (7.00)     |
| Merchant                 | 37 (36.00)   |
| Housewife                | 47 (46.00)   |
| Religion                 |              |
| Islam                    | 40 (39.00)   |
| Orthodox Christian       | 23 (22.00)   |
| Protestant Christian     | 40 (39.00)   |
| Residence                |              |
| Urban                    | 61 (59.20)   |
| Rural                    | 42 (40.80)   |
| Gestational age          |              |
| <5 mo                    | 81 (79.00)   |
| ≥5 mo                    | 22 (21.35)   |

$^a$Majang, Checko, and Agnuak.
Studies reported that HIV/AIDS patients failed to adhere to their medication because of the side effects of the drugs, forgetting the pills, and distance of the health facilities from home. The current study also identified these factors among the main hindrances to patient adherence to the prescribed medication. Such obstacles may open door for disease progression and hence put patients’ health at risk. Drug resistance, one of the challenges in the current health care delivery may also result and hence need to be paid attention.

The current study showed that frequency of counseling was associated with ART adherence. Respondents who were counseled repeatedly were more likely to have good adherence than those who were not. This finding is similar to study done in Tigray regional state that underlined patients counseling as one of the main factors affecting ART adherence. The association between these 2 variables shows the significance of patient counseling in promoting adherence and therefore the facilities are expected to take lessons from this relationship and strengthen their counseling activity.

It was revealed in the current study that patients with greater than 350 CD4 cells were more likely to exercise overall good adherence practices than patients having 350 and less CD4 cells. This higher adherence exercise might come from the fact that ART increases CD4 cells count and the patients’ belief that they were getting better and better with increase in CD4 count and patients’ self-convincing that they should adhere more to get better improvement. The decrease in adherence level with an increase in disease’s clinical stage in the current study might be associated with patients’ inability to tolerate the side effects of the medication with increased disease stage and hence patients preferring to skip or cut the doses. Distance of the facility from patients’ home might also matter. Those patients with earlier stage are more likely to have the ability to collect their medication from distant facility compared to those with progressed stage.

It was found in Zambia and Tanzania that stigma associated with being HIV/AIDS positive demoralizes patients and negatively influences their adherence to the prescribed medication. The current study also found that pregnant women who did not experience stigma exercised good adherence compared to those who experienced stigma associated with HIV/AIDS. The consequences of this odd view are not limited to the patients; it affects family, society, and the country at large. The effect that it has on economy and societal relation is also enormous and therefore the health facilities, nongovernmental organizations, scholars, and society should contribute much on how to tackle this sense of disgrace and empower HIV/AIDS patients in general and pregnant women in particular. Those patients who received support from their families were found to be more likely to adhere to their medication compared to those who did not in the current study just in line with the result of the study conducted in Nigeria.

**Conclusion**

Even though there exist issues to be addressed, the overall patient adherence to ART in the study facilities was good. Concerned stakeholders including the health facilities, nongovernmental organizations, zonal health offices, regional health bureau, and ministry of health should work better in tackling the identified obstacles of adherence.
Table 4. Factors Associated With Medication Adherence Among HIV-Positive Pregnant Women on Follow-up at the Antiretroviral Therapy Clinic of Mizan Tepi University Teaching and Tepi General Hospitals, 2018 (N = 103).

| Variables                        | MMAS Overall Status |
|----------------------------------|----------------------|
|                                  | Good, Frequency (%)  | Poor, Frequency (%) | \( \chi^2 \) | \( P \)   |
| Social drug use                  |                      |                     |
| Coffee                           | 56 (82.4)            | 20 (57.1)           | —            | .061     |
| Others*                          | 11 (16.2)            | 15 (42.9)           | —            |          |
| Occupation                       |                      |                     |
| Farmer                           | 10 (15)              | 2 (6)               | —            | .080     |
| Merchant                         | 26 (38)              | 11 (31)             | —            |          |
| Housewife                        | 25 (37)              | 22 (63)             | —            |          |
| Frequency of counseling          |                      |                     |
| Yes                              | 62 (91.2)            | 27 (77)             | 37.529       | .000*    |
| No                               | 6 (8.8)              | 8 (23)              | —            |          |
| CD4 count                        |                      |                     |
| \( \leq 350 \)                   | 2 (3)                | 19 (54)             | 17.515       | .000*    |
| \( > 350 \)                      | 66 (97)              | 16 (46)             | —            |          |
| WHO clinical stage               |                      |                     |
| Stage I                          | 39 (57)              | 5 (14)              | 70.426       | .000*    |
| Stage II and above               | 29 (43)              | 30 (86)             | —            |          |
| Stigma                           |                      |                     |
| Yes                              | 4 (6)                | 31 (90)             | 46.383       | .000*    |
| No                               | 64 (94)              | 4 (11)              | —            |          |
| Family support                   |                      |                     |
| Yes                              | 52 (76.5)            | 2 (6)               | —            | .065     |
| No                               | 16 (23.5)            | 33 (94)             | —            |          |
| Opportunistic infection status   |                      |                     |
| Yes                              | 56 (82)              | 29 (82.8)           | —            | .000*    |
| No                               | 12 (18)              | 6 (17.14)           | —            |          |

Abbreviation: MMAS, Morisky Medication Adherence Scale.

*Tea and chemo.

*Statistically significant (\( P < .05 \)).

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Author Contributions

GD designed the research work and facilitated data collection process. TA conducted the overall analysis with GD and drafted the manuscript. AZ and TN provided guidance on the work and corrected the manuscript. All authors read and approved the final manuscript.

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Ethical Approval

Ethical clearance was secured from the department of pharmacy, college of Medicine and Health Sciences, Mizan Tepi University and submitted to the study hospitals’ administrative bodies for obtaining a permission to undertake this study.

Informed Consent

Participants were provided an explanation on the study aims and were included in the study after they provided verbal consent. The confidentiality of the study participants was maintained by assigning unique study identifiers during data collection and analysis.

ORCID iDs

Temesgen Aferu https://orcid.org/0000-0003-1532-7359
Tadesse Nigussie https://orcid.org/0000-0003-3123-5809

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