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Level of Adherence to Option B plus Prevention of Mother-to-Child HIV Transmission and Associated Factors among HIV-Positive Pregnant and Lactating Women at Health Facilities of Jigjiga Town, Eastern Ethiopia

Mekonin Meskelu Shegere[1], Workineh Diriba Gemechu[2], Endalkachew Mekonnen Eticha[3]*, Ahmed Mohamed Ibrahim[4], Girma Tadesse Wedajo[5], Ramadan Budul Yusuf[6], Abdurrahman Kedir Roble[7] and Amin Ugas Mahad[8]

[1,2,3,4]School of Medicine, College of Medicine and Health Science, Jigjiga University, Jigjiga, Ethiopia
[4,7]School of Public Health, College of Medicine and Health Science, Jigjiga University, Jigjiga, Ethiopia
[5]6Department of Nursing, College of Medicine and Health Science, Jigjiga University, Jigjiga, Ethiopia
[8]Department Midwifery, College of Medicine and Health Science, Jigjiga University, Jigjiga, Ethiopia

Abstract

Background: Option B+ Prevention of Mother-To-Child HIV Transmission (PMTCT) is a global provider of antiretroviral therapy to pregnant and lactating women infected with HIV without eligibility criteria.

Objective: To determine the level of adherence and factors associated to Option B+ PMTCT among HIV-positive pregnant and lactating women.

Methodology: A cross-sectional study was carried out among 233 HIV-infected pregnant and lactating women who had been enrolled in PMTCT follow-up units in Jigjiga Hospitals. The sample size was calculated using a single-population proportion formula. Descriptive statistics were used to summarize the frequency and percentages of participants' socio-demographic and clinical characteristics. Multivariate logistic regression was used to estimate factors associated with adherence to option B+ PMTCT drugs.

Results: The overall level of adherence to option B+ during pregnancy and breastfeeding was 73.4%. Pregnant and lactating women who had partner support [Adjusted Odd Ration (AOR) = 7.36, 95% CI (2.89, 18.71)] and initiated PMTCT service at the time of diagnosis [AOR = 2.75, 95% CI (1.01, 7.46)] were more likely adhered to the service than their comparators. Similarly, achieving higher educational level [AOR = 10.50, 95% CI (1.82, 60.76)] and five or more frequent antenatal care follow-ups [AOR = 5.71, 95% CI (1.15, 28.45)] were positively associated with good adherence.

Conclusion: In this study, the level of adherence to option B+ PMTCT service was less than the recommended adherence level to prevent vertical transmission.

Keywords: Adherence; Option B+, PMTCT; Pregnant and Lactating Women; Jigjiga Town

Introduction

The World Health Organization (WHO) estimates that 19.3 million women were living with Human Immune Deficiency (HIV) globally in 2020, and 660,000 women were newly infected. In 2020, 1.7 million children were living with HIV. The Joint United Nations Programme on HIV/AIDS (UNAIDS) reported that, globally, in 2020 an estimated 150,000 children newly acquired HIV, and an estimated 1.8 million children were living with HIV. Mother-To-Child Transmission (MTCT) or "vertical transmission" is a significant contributor to the HIV pandemic globally. It can occur during pregnancy, labor-delivery and breastfeeding [1].

Prevention of Mother-To-Child HIV Transmission (PMTCT) is a global provider of antiretroviral medicines to pregnant and lactating women infected with HIV to reduce the risk of transmitting HIV to infants during pregnancy, delivery and the postpartum period. If PMTCT program is not implemented, 20-50% of children born to women living with HIV can acquire the virus from their mothers during pregnancy, labor, delivery, and breastfeeding. In Ethiopia, the pooled burden of MTCT was 11.4%.

WHO has started to implement different strategies for the optimization of PMTCT care and support: option A, Option B and Option B+. The third option is being used_ Option B+. Option B+ strategy is launched in early 2013 which recommends the use of the fixed triple regimen for all HIV-positive mothers regardless of CD4 count. The strategy has an advantage of further simplification of regimen and service delivery, harmonization with the programs and avoiding stopping and starting drugs. In Ethiopia, the Option B+ strategy was launched in 2013 as a national policy to prevent MTCT among HIV-positive pregnant and breastfeeding women regardless of their immunological status in accordance with Ethiopia's comprehensive guidelines for PMTCT. Today, the majority of HIV-infected women are on option B+ regimens to remain healthy and to prevent new HIV infections of children [2].

Option B+ regimens effectiveness depends on adherence and retention of mothers to the care. Non-adherence to PMTCT drugs increases the risk of treatment failure, MTCT, maternal HIV disease

***Corresponding author:** Endalkachew Mekonnen Eticha, School of Medicine, College of Medicine and Health Science, Jigjiga University, Jigjiga, Ethiopia, Tel: +251 967344420, E-mail: obsaamiiraa@gmail.com

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progression, and the potential development of drug resistant virus. Currently, adherence to ART regimen becomes a major challenge especially in low and middle income countries which significantly undermines the success of the regimen. This is still a serious challenge which is slowing down the success of the programme.

Despite several studies were conducted across different countries to assess the level of adherence to option B+ PMTCT service and factors associated, all the findings indicated suboptimal adherence level to prevent MTCT. Since 2013, option B+ strategy was launched in phased approach to prioritize health centers that provide both PMTCT and ART services. However, to date, no adherence study was conducted in Somali region of Ethiopia. Therefore, information about the level of adherence to option B+ PMTCT service in the Somali region of Ethiopia remains unclear and needs further investigation. This study was aimed at assessing the level of adherence to option B+ PMTCT service and associated factors in the Somali region of Ethiopia [3].

Materials and Methods

Study Design, Period and Participants

A hospital-based retrospective cross-sectional study design was conducted in two governmental hospitals of Jigjiga town, Somli, Ethiopia from January to March 2020. The town is located 628km from Addis Ababa, the capital city of Ethiopia. According to 2021 Ethiopian Statistics Agency populations projection of towns, the estimated total populations of the Jigjiga town was 191,889 with 99,571 males and 318, 191 females. In the town, there are two governmental Hospitals (Karamara Hospital (KH) and Sheik Hassan Yebare Referral Hospital (SHYRH)), one private Hospital, 3 health care centers and 20 health posts. The two governmental hospitals serve as referral for all Somali Region estimated over 1.5 million populations. Karamara Hospital started Option B+ strategy in 2013, the first in Somali region. The selected Hospitals provide several health care services to the community. These includes: ART and TB treatment, anti-natal care, delivery service, emergency service, OPD service, inpatient service, surgery and orthopedics service, psychiatry service and pharmacy service.

The participants were all HIV-infected pregnant and lactating women who had been enrolled in the PMTCT programme in the two governmental hospitals. Participants who were transferred to other health facilities for PMTCT follow-up were excluded from the study [4].

Sample Size Determination and Sampling Procedure

The sample size was calculated using a single-population proportion formula with the following assumptions. Expected option B+ ART adherence level of 83.7% from the study conducted in the northeast part of Ethiopia (16), 95% Confidence Interval (CI), and 5% margin of error. Considering the non-response rate (10%), the final sample size was 233 HIV-positive pregnant and lactating women.

The two hospitals were purposively selected by considering a large number of HIV-positive pregnant and lactating women enrolled for option B+ PMTCT service at the facilities. The probability proportional to size method was used to allocate the calculated sample size to the selected health facilities (KH (n=110) and SHYRH (n=123)). Individual unique ART number was retrieved from their registration book and the number was used to find their PMTCT logbook, ART intake form, and medical cards. A systematic sampling technique was used to select the study subjects (k=2) using their ART number.

Data Collection Tools and Instruments

Data were collected using a structured questionnaire. The questionnaire was initially prepared in English and translated to both Amharic and Af-Somali. Amharic and Af-Somali versions were back-translated to English to check for any inconsistency in the meaning of words and concepts. The data collection tool includes socio-demographic characteristics: age, marital status, educational status, occupation status and monthly income; and baseline clinical and laboratory characteristics: time of HIV diagnosis, frequency of Ante Natal Care (ANC) follow-up, WHO clinical stages, CD4 count, PMTCT at diagnosis, and partner support.

Four self-reporting questions regarding their experience with the ART medication were used to assess their level of adherence. These questions were adapted from standardized multi-method ART adherence measurement tools for low resource settings. The questions include;

1) Do you sometimes find it difficult to remember to take your medication during your current pregnancy ?

2) When you feel better, do you sometimes take a break from your medication ?

3) Thinking back over the past three days, have you missed any of your doses ?

4) Sometimes if you feel worse when you take the medicine, do you stop taking it ?

If the participants answer "No" to all four questions, she was classified as highly adherent. If there was at least one 'Yes' answer, she was classified as moderately adherent. Where there were 2 or more 'Yes' answers, she was classified as having low adherence.

Two trained data collectors (one B. Sc nurse and one Midwifes) participated in data collection. Data collectors were oriented about the objective of the study for eligible individuals and requested their informed written consent. Two principal investigators supervised the data collection process. The interview was conducted at the exit of the PMTCT follow-up room by using a data collection tool [5].

Data Processing and Analysis

The collected data were screened, sorted, coded, entered and analyzed by use of SPSS version 25 and presented in the form of frequency tables. Descriptive statistics were used to summarize the frequency and percentages of participants' socio-demographic and clinical characteristics.

Bivariate logistic regressions were used to select important variables candidate for the multivariate logistic regression. Multivariable logistic regression was used to assess the effect of independent variables on dependent variables and to select important predictors of the level of PMTCT option B+ adherence. Variables with a p-value of less than 0.25 in the binary logistic regression analysis were selected as candidate variables for multivariable logistic regression analysis. The presence of statistical significance was declared when the p-value was less than 0.05 with a 95% CI [6].

Ethical Consideration

Ethical clearance was obtained from the ethical review committee of the College of Medicine and Health Science, Jigjiga University. Permission to conduct the study was also obtained from the KH and SHYRH Medical Directorates. Written informed consent was obtained

from all the participants before data collection. Participants had the right to self-determination regarding participation in research, both initially and during the research. The confidentiality of the study participants was maintained by assigning unique identifiers during data collection and analysis. The study was conducted in accordance with the Declaration of Helsinki.

Results

Socio-Demographic and Clinical Characteristics

A total of 233 HIV-positive pregnant and lactating women taking option B+ were included in the study. The majority of the study participants, 104 (44.6%), were between the ages of 31 and 40 years and they were married, 184 (79%). Most of the participants were housewives, 108 (46.6%) and had a monthly income of between £ 25-62.5.

Half of the participants (118, 50.6%) were on WHO clinical stage I and had a CD4 count greater than 350cells/ml3 at the time of ART initiation. The majority of the study participants had five or more ANC follow-ups (105, 45.1%) and were known HIV-positive (125, 53.6%) before pregnancy. Most of the participants (187, 80.3%) were enrolled on option B+ PMTCT service at the time of HIV/AIDS diagnosis. All participants were on the same triple ART regimen containing Tenofovir (TDF) + Lamivudine (3TC) + EFaVirenz (EFV). The finding of the study indicated that greater than half of the women (123, 52.8%) had partner support.

Adherence to Option B+ PMTCT Service

The overall level of adherence to option B+ PMTCT service during pregnancy was 171 (73.4%). Reasons for non-adherence to option B+ PMTCT service were fear of stigma (34, 47.9%), forgetting pill schedule (15, 21.1%), lack of information on health benefits of PMTCT service (11, 15.5%), lack of partner support (7, 9.9%), and pill side effects (4, 5.5%) [7].

Factor Associated with the Level of Adherence to Option B+ PMTCT Service

Multivariate logistic regression analysis was performed to identify factors associated to adherence to option B+ PMTCT service. According to the findings, marital status, level of education, frequency of ANC follow-ups, PMTCT service initiation at the time of diagnosis, and partner support were significantly related to the level of adherence to option B+ PMTCT service.

Women with a higher level of education were ten times more likely to adhered to option B+ PMTCT service than women with no formal education [AOR = 10.50, 95% CI (1.82, 60.76)]. Furthermore, HIV-positive pregnant and lactating women who had five or more antenatal care follow-ups were nearly six times more likely to adhere to option B+ PMTCT service than women who had two or fewer antenatal care follow-ups [AOR = 5.71, 95% CI (1.15, 28.45)].

Participants who were started on option B+ PMTCT at the time of diagnosis were three times more likely to stick with ART [AOR = 2.75, 95% CI (1.01, 7.46)] than HIV-positive pregnant and lactating women who did not [AOR = 2.75, 95% CI (1.01, 7.46)]. Furthermore, participants who had partner support were seven times more likely to adhere to option B+ PMTCT than women who did not have partner support [AOR = 7.36, 95% CI (2.89, 18.71)] [8].

Discussion

The current study indicated that the level of adherence to option B+ during pregnancy was suboptimal (73.4%) which was low compared to the recommended adherence level of 95% and a prevent mother-to-child HIV transmission and drug resistance. This level of adherence is lower than the study conducted in Southwestern Ethiopia (81.1%), East Showa (82.6%), Southern Ethiopia (88.2%), Amhara (87.9%) and Tigray region of Ethiopia (87.1%). The finding is also lower than the studies conducted in Kenya (82%), Zambia (82.5%) and Ukraine (86%). A higher level of adherence was also observed from systemic review and meta-analysis conducted in low-income and middle-income countries (76.1%) than the current study. However, this finding is higher than the study done in Tanzania (26.3%) and Uganda (51%). This discrepancy might be from the difference in the study setting and participants used, in addition to others like infrastructure, awareness, and time of studies. A study in Uganda measures the adherence level only for postpartum. For the study conducted in Zambia, the study design used which is a prospective cohort might be a matter.

This study indicated that 26.6% of pregnant and lactating women were non-adherent to option B+ PMTCT service due to fear of stigma, forgetting pills' schedule, lack of information on health benefits of PMTCT service, and lack of partner support and pill side effects. A similar finding was reported in a study conducted in the East Shewa Zone, Oromia region, Southern Ethiopia and Malawi that found that fear of stigma and discrimination, drug side effects, difficulty in adopting a time schedule, and forgetting to take medication reduces the level of adherence to option B+ PMTCT service.

In this study, the educational status was strongly associated with ART adherence. The respondents who had secondary school and higher educational levels were more likely to have good adherence than those who had no education (illiterate). Similarly, educational status was strongly associated with adherence as reported in the previous study from the East Showa Zone of Ethiopia, Malawi, Tanzania, and Ghana. This might be due to better educated have access to information and are more likely to make better-informed decisions [9].

In this study, a high level of adherence to option B+ PMTCT service was observed among women who had partner support (91.1%). The finding showed that women who received support from their partners were 7 times more likely to have adhered than their counterparts. This finding is similar to a study conducted in Hawassa city and Hadya (72%) region of Ethiopia which reported that women with good partner involvement in PMTCT care and support had more likely to be adherent to option B+ PMTCT as compared to the others. This might be due to the usual benefit of receiving support for moral encouragement and health care assistance through reminding the time of drug-taking. A similar finding was reported in a study conducted in the Republic of Congo that the involvement of a male partner increases maternal ART uptake and reduces vertical transmission of HIV.

Women who had five or more antenatal care follow-ups were more likely to be adherent to option B+ during pregnancy. Similar findings were reported in a study conducted in southern Ethiopia that found women with more ANC visits were more likely to be adherent. This may be because of the fact that frequent contact with healthcare providers increases the opportunity to be counselled about ART adherence.

The finding indicated that women who initiated PMTCT service at the time of diagnosis had relatively good adherence to Option B+ PMTCT compared to women who had not. A similar finding was reported in a study conducted in Southern Ethiopia that found initiating ART at the time of diagnosis was significantly associated with good adherence to option B plus ART [10].

Limitations of the Study

This study used a registration logbook, which is a secondary data, and the information obtained from the record was limited due to unregistered outcome. The study did not analyze the child outcome and therefore, we do not have information about the full spectrum of the mother-child cohort. The current study was cross-sectional; therefore, it is difficult to identify causal-effect relationship.

Conclusion

In this study, the level of adherence to option B+ PMTCT service during pregnancy and lactation was suboptimal or less than the recommended adherence level to prevent vertical transmission. Fear of stigma, forgetting pill schedules, a lack of information on the health benefits of PMTCT service, a lack of partner support, and pill side effects all contributed to a lack of adherence to option B+ PMTCT service. Level of education, number of ANC follow-ups, PMTCT service initiation at the time of diagnosis, and partner support were all significantly related to the level of adherence to option B+ PMTCT service.

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Ethical Approval and Consent to Participate

Ethical clearance was obtained from the ethical review committee of the College of Medicine and Health Science, Jigjiga University. Permission to conduct the study was also obtained from the KH and SHYRH Medical Directorates. Written informed consent was obtained from all the participants before data collection. Participants had the right to self-determination regarding participation in research, both initially and during the research. The confidentiality of the study participants was maintained by assigning unique identifiers during data collection and analysis. The study was conducted in accordance with the Declaration of Helsinki.

Author's Contribution

M.M.A and E.M.E made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, and drafting the manuscript or in all these areas. A.M.I, G.T.W, R.B.Y, A.K.R, and A.U.M participated in revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agreed to be accountable for all aspects of the work.

Availability of Data and Materials

All relevant data are within the paper. The SPSS data of individual participants are not permitted to be provided to other bodies, as indicated on ethical clearance. However, researchers who need further clarification can obtain anonymized data from the corresponding author on reasonable request.

Consent for Publication

Not applicable

Competing Interests

The authors declare that they have no competing interests

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