

# Assessment of Effect of Knowledge and Medication Adherence on Prevention of Mother to Child Transmission of HIV among Postnatal HIV Women in Tertiary Care Hospital

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**Abstract:** ***Introduction:** HIV is a virus that attacks the body natural immune system. The virus will act against the body's natural defense system and destroy a type of white blood cell in the immune system called a T-helper cell (CD4 cell). In India, preventing mother-to-child transmission (PMTCT) of Human Immunodeficiency Virus (HIV) remains one of the foremost challenges in community health. Countrywide MTCT of HIV is estimated to be >10,000 annually. **Objective:** The assess the effect of knowledge and adherence on prevention of MTCT of HIV among postnatal women in tertiary care hospital. **Methods:** A prospective observational study was carried out in GGH, Ongole for a period of 6 months. The knowledge of HIV infected postnatal women about MTCT and adherence to ART regimen among 238 patients was assessed. **Results:** Our study involves 248 patients out of which 238 patients were included among them 231 patients (97.4%) have adequate knowledge and 230 patients (96.54%) have complete adherence to ART regimen. Out of which 8 patients did not have complete adherence towards ART, which among 7 patients finally leads to HIV transmission from mother to child after parturition. **Conclusion:** From our study we concluded that having knowledge on MTCT and complete adherence towards ART have prevented the transmission of HIV infection from mother to child.*

**Keywords:** HIV (Human Immunodeficiency virus), PMTCT (prevention from mother to child transmission) AIDS (acquired immunodeficiency syndrome)

## 1. Introduction

Human immunodeficiency virus [HIV] is the virus that attacks the body natural immune system. HIV belongs to genus Lentivirus within the family of Retroviridae, subfamily Orthoretrovirinae<sup>(1)</sup>. The virus will act against the body's natural defense system and destroy a type of white blood cell in the immune system called a T-helper cell (CD4 cell)<sup>(2)</sup>. There are two types of HIV [HIV-1 & HIV-2]. HIV-1 is the most prevalent type throughout the world and closely related to Simian Immunodeficiency Virus (SIV) prevalent in chimpanzees of west central Africa and HIV-2 has limited geographic distribution<sup>(3)</sup>. The signs of HIV infection varies in type and severities from person to person, The WHO classification for adults divided individuals into one of four stages, ranging from stage 1 (asymptomatic), stage 2 (mildly symptomatic), stage 3 (moderately symptomatic), and stage 4 (AIDS)<sup>(4)</sup>. HIV can be diagnosed through blood [Antigen/antibody test, NATs] or saliva testing [Antibody test]. CD4 T cell count, viral load [HIV RNA] test will help to diagnosis the clinical stage of HIV<sup>(5)</sup>. The virus can be transmitted from person to person through sexual contact or by contact with infected blood, semen, or vaginal fluids. HIV can also transfer from mother to child during pregnancy or at time of delivery or during the breastfeeding time<sup>(6)</sup>. In India, preventing mother-to-child transmission (PMTCT) of Human Immunodeficiency Virus (HIV) remains one of the foremost challenges in community health. Countrywide MTCT of HIV is estimated to be >10,000 annually<sup>(7)</sup>. Prevention of mother-to-child transmission has seen advances in both industrialized and resource-constrained settings<sup>(8)</sup>. Intrapartum transmission has been reduced by increasing access to interventions such as one dose of nevirapine to mother and newborn baby.

HIV-1 can be transmitted by breastfeeding, replacement feeding is recommended in many mothers. More attention is starting to focus on the pregnant mother, especially initiation of antiretroviral therapy in mothers with low CD4+ counts during pregnancy and post-natal mothers<sup>(9)</sup>.

## 2. Methodology

### Study population:

A prospective observational study was carried out for a period of 6 months in an ART department in a tertiary care hospital. The total of 248 postnatal mothers, women above 18 years old who are diagnosed AIDS, Women who are in their 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> trimester of pregnancy were included. 10 out of 248 patients who did not attend the phone call are excluded. In the study the patient data was collected from the records of registers available in the Hospital records. Through phone call the Knowledge about MTCT of HIV and adherence to ART medication was enquired and recorded in a well-designed questionnaire. For every answer to the question was marked with a tick, so that the Level of knowledge and practices of new-born care can be rated. The collected data was later assessed and used in statistical interpretations.

### The questionnaire:

Questionnaire was the main tool for data collection. The entire Questionnaire was divided into five parts - demographic variables as well as knowledge assessment questions. The formal part was used to record participants various demographic characteristics such as age, education, occupation, economic status. The later was the main session to assess the knowledge of mothers about MTCT of HIV and adherence to ART.

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The five categories are:

- Demographic variables of HIV positive pregnant women and
- ART registered details
- Knowledge and awareness assessment questions
- Adherence assessment questions
- New-born baby details.

**Variables:**

Variables evaluated for the study includes socio-demographic details of participants who were aged as 18-25 years, 26-35years old. Majority of them where in the age group of 18-25 years old (63.4%), followed by 26-35 years old (36.5%) group. Among them 53 participants were urban (22.2%) and 185 participants were rural (77.7%). Most of women are illiterate i.e. 99 (41.6%), 77 participants (32.4%) had elementary completed, 53 participants (22.3%) had high school completed, 9 participants (3.8%) had completed UG/PG. Most of the women were unemployed. A total of 197 (82.7%) were housewife’s, 41 (17.2%) were working.

**3. Results**

In our study we have collected 248 patient details of HIV mother from which 238 patients were included in the study who met inclusion criteria.

**Knowledge Assessment:**

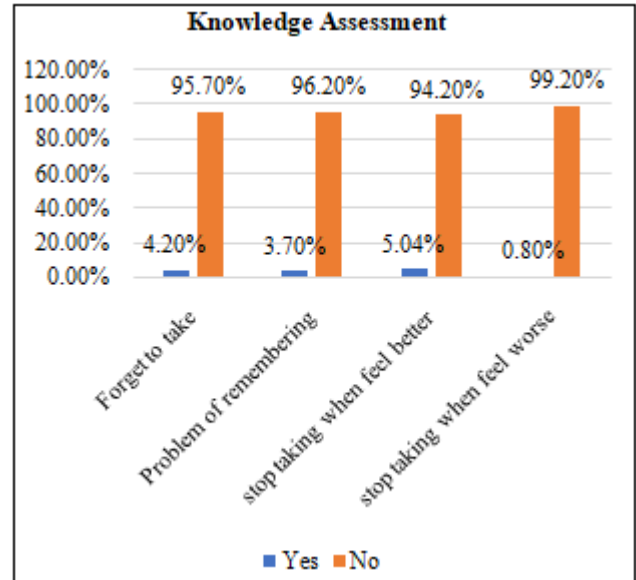
We compared the knowledge of participants with their outcome of delivery.

**Table 1: Knowledge Assessment of Participants**

Question	Answer	N	%
Did she aware of having HIV?	YES	237	99.57%
	NO	1	0.42%
Did she have any idea about the disease condition and PMTCT?	YES	228	95.8%
	NO	10	4.2%
Did she aware to visit doctor?	YES	235	98.7%
	NO	3	1.2%
Did she aware of going for regular checkup and refilling of medicine?	YES	228	95.8%
	NO	10	4.2%

Study respondents were asked four questions on prevention of mother to child transmission in a self-administered questionnaire. The MMAS (Measurement and Scoring Criteria) is self-reported knowledge assessment scale with specific questions. The MMAS consists of four items with a scoring scheme of “YES” =1 and “NO” =0.

The analysis of data indicated that most of respondents had good knowledge about HIV PMTCT.



**Figure 1: Knowledge assessment of participants**

We used the Mann-Whitney U test to compare the outcome of the baby with the knowledge of the HIV pregnant women. We used one tailed hypothesis for calculation.

Significant level was calculated at 0.5.

The U-value is 232.5 and the Z-ratio is -18.71935

Mann-Whitney U test shows the result is significant at p<.05 and p-value is < .00001.

**Adherence Assessment:**

We compared the adherence of participants with their outcome of delivery.

Study respondents were asked five questions based on a self-administered adherence questionnaire by NACO program during the participants refilling of their ART medications.

**Table 2: Adherence Assessment of Participants**

Adherence	Answer	N	%
Did you ever forget to take your ART medicine?	Yes	10	4.2%
	No	228	95.7%
Did you ever have problem of remembering to take your medicine?	Yes	9	3.7%
	No	229	96.2%
Do you stop taking your medicine when you feel better?	Yes	12	5.04%
	No	226	94.2%
Do you stop taking your medicine when you feel worse?	Yes	2	0.8%
	No	236	99.2%
Do you miss refilling your medicines?	Yes	10	4.2%
	No	228	95.7%

The MMAS (measurement and scoring criteria) is self-reported adherence assessment scale with specific questions. The MMAS consists of five items with a scoring scheme of “YES” = 1 and “NO” = 0.

The items are summed to give a range of scores from 0 to 5.

The analysis of data indicated that most of respondents had complete adherence about ART medication and PMTCT.

We used the Mann-Whitney U test to compare the outcome of the baby with the knowledge of the HIV pregnant women. We used one tailed hypothesis for calculation.

Significant level was calculated at 0.1.

The U-value is 578.5 and the Z-ratio is -18.48876.

Mann-Whitney U test shows the result is significant at  $p < .05$  and p-value is  $< .00001$ .

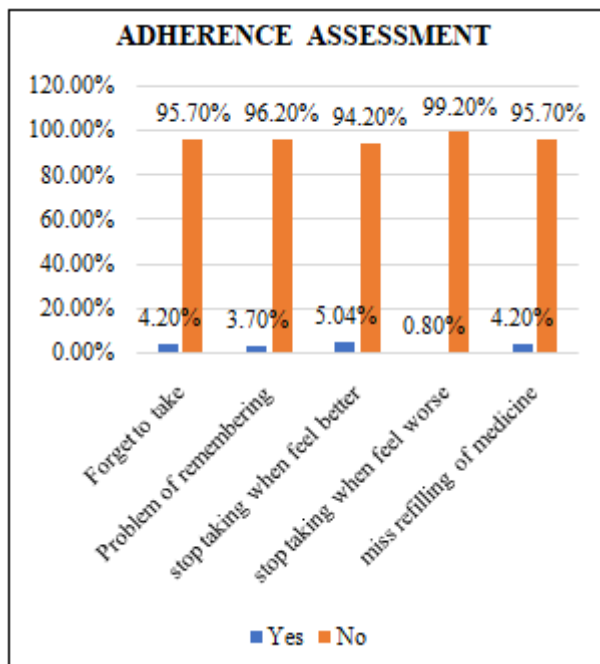


Figure 2: Adherence assessment of participants

Table 3: Association between level of knowledge and adherence in post natal mothers (n=238)

Knowledge	Number	Percentage
Adequate	231	97.4%
Inadequate	7	2.50%
Adherence	Number	Percentage
Complete adherence	230	96.54%
Incomplete adherence	8	3.50%

#### 4. Discussion

In our study period we assessed the knowledge of respondents by a self-designed questionnaire and collected the data from total of 238 participants through phone call. Among 238 women 99 are illiterate (41.6%), 77 elementary education (32.4%), 53 high school completed (22.3%), 9 completed UG or PG (3.8%). Hence most of the respondents are educated, compared to illiterate could somehow affect the understanding of the disease condition and transmission. Apart from their education status the respondents had good knowledge on ART and PMTCT and this could be due to the counselling of physician and healthcare staff in GGH as part of NACO program. 97.46% of participants have a good knowledge on the PMTCT and this influences their motivation and uptake of Anti-retroviral for PMTCT

In a similar study, Daniel Boateng, Kwabong G.D et al, BMC Women's Health 2013; 13(2): 17-19<sup>(10)</sup>. Daniel Boateng explored and reported explored the knowledge and

perception and their predisposing factors through interviews with 229 women who were HIV positive. Respondents had good knowledge on ART and PMTCT and this could be partly due to the institution of counselling as part of the programme, where new clients are taken through the benefits of adhering to ART, the problems associated with defaulting ART and issues relating to PMTCT

In our study period we assessed the adherence of respondents by a self-designed questionnaire form and collected the data from total 238 participants through phone call. The MMAS is a self-reported adherence scale with specific questions and summarized the score from 0-25. In our study the respondents had good adherence on ART, and this could be due to the counselling of physicians and healthcare staff in GGH as part of NACO programme. In our study 96.5% of participants have good adherence towards the ART and this influence of their motivation and uptake of antiretroviral for prevention of transmission HIV from mother to child during pregnancy and breastfeeding time.

In a similar study, Hansana V, Sanchaisuriya P et al, BMC Public Health. 2013 Jun 28; 13:617<sup>(11)</sup>. High levels of adherence were reported in their study, most women (>80%). Levels of adherence reported during and after pregnancy were similar. Poor adherence during pregnancy was more commonly reported among women living with their extended family, women not living with a partner, younger women, and those with an unplanned pregnancy (factors which were inter-related).

The results of the study shows that participants mothers had a good adequate level of knowledge on PMTCT. In our study most of the participants mother's adequate knowledge with a percentage of 97.46% and 2.50% participant mother had inadequate knowledge on PMTCT and ART.

#### 5. Conclusion

From our study we conclude that majority of women have an adequate knowledge (97.46%) on their HIV condition and PMTCT and aware on the morbidities of HIV transmission, we also conclude that having a complete adherence towards ART have prevented the transmission of HIV infection from mother to child.

Hence the maternal knowledge and adherence about HIV and PMTCT plays a major role in prevention of HIV transmission. Educating the mothers and also their family members play an important role in PMTCT.

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#### Conflict of Interest:

The authors show no conflict of interest.

## References

- [1] Luciw PA. Human immunodeficiency viruses and their replication. In: Fields BN, editor. *Virology*. 3rd ed. Philadelphia: Lippincott-Raven; 1996. pp. 1881–1952.
- [2] HIV Basics, Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention. 2019.
- [3] Berger E. A, Doms R. W, Fenyo E. M, Korber B. T, Littman D et.al., A new classification for HIV-1. *Nature*. 1998; 391(6664): 240.
- [4] World Health Organization. Interim WHO clinical staging of HIV/AIDS and HIV/AIDS case definitions for surveillance: African region. Switzerland: World Health Organization; 2005.
- [5] Jennings C, Fiscus SA, Crowe SM, et al. Comparison of two human immunodeficiency virus (HIV) RNA surrogate assays to the standard HIV RNA assay. *J Clin Microbiol*. 2005;43:5950–56.
- [6] Flynn P. M et al., Prevention of HIV-1 transmission through breastfeeding: efficacy and safety of maternal antiretroviral therapy versus infant nevirapine prophylaxis for duration of breastfeeding in HIV-1-infected women with high CD4 count (IMPAACT PROMISE): a randomized, open-label, clinical trial. *Journal of Acquired Immune*. 2018; 77(2): 383- 392.
- [7] Bhatta, M., Dutta, N., Nandi, S. et al. Mother-to-child HIV transmission and its correlates in India: systematic review and meta-analysis. *BMC Pregnancy Childbirth* 20, 509 (2020).
- [8] Luzuriaga K, Sullivan JL. Prevention of mother-to-child transmission of HIV infection. *Clin Infect Dis*. 2005;40:466–67.
- [9] Duerr A, Hurst S, Kourtis AP, Rutenberg N, Jamieson DJ. Integrating family planning and prevention of mother-to-child HIV transmission in resource-limited settings. *Lancet*. 2005; 366:261–63.
- [10] Boateng D, Kwapong G.D et al., knowledge, perception about antiretroviral therapy (ART) and prevention of mother to child transmission (PMTCT) and adherence to ART among HIV positive women in the Ashanti tegion, Ghana: a cross sectional study. *BMC Women’s Health* 2013; 13(2): 17-19
- [11] Bailey H, Thorne C, Malyuta R et al., Adherence to antiretroviral therapy during pregnancy and the first year postpartum among HIV-positive women in Ukraine. *BMC Public Health* 2014; 2(14): 993-995.