ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF NURSING AND MIDWIFERY

POSTGRADUATE PROGRAM

MOTHER- TO-CHILD TRANSMISSION OF HIV AND ASSOCIATED FACTORS AMONG EXPOSED INFANTS IN JINKA TOWN HEALTH FACILITIES, SOUTH OMO ZONE, SOUTH ETHIOPIA, 2020.

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RESEARCH THESIS SUBMITTED TO GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY, SCHOOL OF NURSING AND MIDWIFERY, DEPARTMENT OF NURSING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN PEDIATRICS AND CHILD HEALTH NURSING

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I, the undersigned MSc student, declare that I have submitted my original work on a title Mother-to-child transmission of HIV and associated factor among exposed infants on follow-up in Jinka town health facilities, south omo zone, south Ethiopia for the examination.

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This thesis by **Kidist Tadewos** is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of masters in Pediatrics &child health nursing

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Acronyms and Abbreviations

AIDS: Acquired Immunodeficiency Syndrome

ANC: Antenatal care

AOR: Adjusted Odds Ratio

ART: Anti-Retroviral Therapy

BSc: Bachelor of Science

CPT: Co-trimoxazole preventive therapy

DBS: Dry blood spot

DNA/PCR: Deoxyribonucleic acid / Polymerase Chain Reaction

EDHS: Ethiopian Demographic Health Survey

FP: Family Planning

HEIs: HIV exposed infants

HAART: Highly Active Anti-Retroviral Therapy

HIV: Human Immunodeficiency Virus

LBW: Low birth weight

MTCT: Mother to child transmission

MUAC: Mid upper arm circumference

NGO: Non-Governmental Organization

PMTCT: Prevention of mother-to-child transmission

SNNPR: South Nation Nationalities and People Republic

SPSS: Statistical Package for Social Science

WLHIV: women living with HIV

Abstract

Background: HIV/AIDS can affect all age groups, but is the leading infectious cause of pediatrics morbidity and mortality in the world. A vast majority of HIV infections in children under the age of 15 were through mother to child transmission. In Ethiopia, MTCT accounts for 95 percent of childhood HIV infections but risk of transmission increases significantly if the mother is untreated

Objective: To assess rate of Mother- to - Child Transmission of HIV and associated factors among exposed infants on follow-up in Jinka town health facilities, South omo zone, South Ethiopia, 2020.

Methodology: A retrospective cohort study was employed among 230 exposed infants in Jinka general hospital and millennium health center at Jinka. Medical records of HIV- exposed infant and their mothers enrolled at PMTCT clinics in the study institution and registered from September/2014 to August /2018 were extracted using data extraction sheet after getting ethical clearance from the Institutional review board of Addis Ababa University. The data was entered in Epi Data 4.2 version and exported to SPSS version 25 for final analysis. Bivariate and multivariable logistic regression were used to identify predictors of HIV vertical transmission. Significance was considered at P-value < 0.05 in the multivariable analysis.

Results: A total of 228 infant-mother records were included in analysis. 5.3% of HEIs got HIV infected vertically in the study area. Not receiving ARV prophylaxis at birth (AOR=5.8, 95% CI: 1.02-33.53, p=0.047), absence of maternal ARV prior to current pregnancy (AOR=5.6,95% CI: 1.14-28.1, P=0.034), mother's advanced WHO clinical stage of HIV at enrollment to PMTCT (AOR: 10.5; 95% CI: 1.4,81, p=0.022) were significantly associated with mother to child transmission of HIV in this study.

Conclusion Infant did not received nevirapine prophylaxis at birth, mothers who were at advanced WHO clinical stage of AIDS, and mothers who did not received ARV prior to pregnancy were at higher risk of mother to child transmission of HIV infection.

1. INTRODUCTION

1.1. Background

Human immunodeficiency virus (HIV) is a major global health emergency. Since 1981, acquired immunodeficiency syndrome (AIDS) first reported, an estimated number of 39 million people have died of AIDS-related diseases globally. It has also appealed the lives of millions and has left behind hundreds of thousands of orphans. Sub –Saharan Africa is the most affected region in the global AIDS epidemic(1,2).

HIV/AIDS can affect all age groups, but is the leading infectious cause of pediatrics morbidity and mortality in the world(3). It is estimated that 160,000 new HIV infections were reported among Children <15 years, mostly from developing countries(4)

A vast majority of HIV infections in children under the age of 15 were trough mother to child transmission (MTCT), which is also known as "vertical transmission", which means the virus is passed to the child when they are in their mother's womb or as they pass through the birth canal, or through breastfeeding(5). MTCT of HIV is a core public health challenge for Sub-Saharan African countries. In Ethiopia, MTCT accounts for 95 percent of childhood HIV infections but risk of transmission increases significantly if the mother is untreated (5). Even though the magnitude of transmission depend upon the presence and duration of breastfeeding, ART and other interventions can reduce this risk (5,6).

In 2009, prior to the launch of the Global Plan, the overall transmission rate (including during the breastfeeding period) was 28% in 21 priority countries including Ethiopia and it has been halved to 14% in 2014, (7).The expansion and closer integration of HIV, maternal and child health, and sexual and reproductive health services are urgently needed to control new HIV(8).

For this reason, Prevention of mother-to-child transmission (PMTCT) programs got emphasis in all countries. The program provides a variety of services for women of reproductive age living with or at risk of HIV to keep their health and stop their infants from acquiring HIV. The services should be offered before conception, and throughout pregnancy, labor and breastfeeding and should include early infant diagnosis and ART initiation as soon as possible (5).

After implementation of Option B+, around 91% of the 1.1 million women receiving antiretroviral drugs as part of PMTCT. Option B+ is a guideline which released in September 2015 by WHO, which recommends all pregnant women living with HIV be immediately provided with lifelong treatment regardless of CD4 count (9). This guideline provides a greater guarantee that women in need of treatment will receive a fully suppressive triple ARV regimen. This can also minimize the risks of infant infection and increase the benefit to their own health, and avoid carelessly receiving a suboptimal ARV prophylaxis intervention, particularly in settings with limited access to CD4 testing(10).

In some countries, more infant infections are now occurring during the postnatal period due to breastfeeding rather than pregnancy or labor due to the high rates of women who leave care(5). For this reason, more effective counselling and preparation of women testing positive for HIV during pregnancy is needed before they start ART to improve adherence levels after they have given birth. Social support group and peer support is particularly needed to help women handle with HIV-related stigma and adhere to treatment(11). Around 1.4 million HIV infections among children were prevented between 2010 and 2018 due to PMTCT programs(5).

1.2. Statement of the problem

HIV/AIDS remains the major infectious cause of pediatrics death worldwide. It is also a major global health emergency, affecting all regions of the world, causing millions of deaths and suffering to millions more(3).

Based on global summary of AIDS epidemics in 2018, approximately 100,000 AIDS-related deaths were reported among Children <15 years(4). Children living with HIV were about half as likely as pregnant women to receive treatment (7). Such a great disparities should be addressed urgently, because if they are not treated, 50% of the children living with HIV will die before their second year birthday(11).

There have been worrying rises in annual HIV infections and AIDS-related mortality in key countries and entire regions. The annual number of new HIV infections has risen in eastern Europe and central Asia (29% increase), the Middle East and North Africa (10% increase) and Latin America (7% increase) (4).

Africa is the most seriously loaded continent where the spread of HIV has been enhanced by a variety of factors, including widespread poverty, gender inequality, and health systems weakness(2,4,5,8).

Mother to child transmission plays a great role in new infection of children. Early diagnosis and treatment of mothers is essential because the risk of mother-to-child transmission of HIV is much higher among newly infected women who are not yet diagnosed and not on treatment. The risk of HIV transmission from an untreated mother living with HIV to her child is as high as 15% to 45%, depending upon the presence and duration of breastfeeding. However, appropriate implementation of PMTCT can reduce this high transmission rate and enable us to make the final HIV transmission rate to 5% or less among breastfeeding women and to 2% or less among non-breastfeeding women by 2020(7,9).

A slight progress has been shown in pediatric HIV diagnosis from 2013 to 2014. Of an estimated 1.2 million HIV-exposed infants among the 21 priority countries including Ethiopia, about 49% received a virologic test to determine their HIV status within the first two months of life in 2014 compared to 40% in 2013. But there was less improvement on antiretroviral therapy accessing. Of the 2.1 million children under 15 years of age living with HIV, only 31% received antiretroviral therapy, compared to 27% in 2013 and 10% in 2009 (7).

Among the 23 priority countries, four countries reported treatment coverage among children was 60% or greater (Botswana, Kenya, Namibia and eSwatini) in 2016, this shows a good progress. But there continues to be low ART coverage among children in the western and central Africa, with six out of eight priority countries reporting treatment coverage in 2016 that was equal to or less than 25%(11). Due to a lack of treatment, 110,000 children died due to AIDS-related illnesses in 2017(12). This goes in contrast with "treat all" recommendations which was launched in 2016 by WHO, which call for immediate HIV treatment for everyone diagnosed with HIV infection. This guideline recommends all people testing positive for HIV should start ART as soon as possible, and within 1 week (13).

The prevalence of HIV in Ethiopia among reproductive age group (15–49) was 1% in 2017 and it shows an insignificant decrease from the number in 2015 (1.1%). Moreover, the number of new HIV infection among children (0–14) was 2, 700 in 2018(2,4,5,8).

Even though EDHS 2011 report shows Prevalence of HIV was 0.9% in South Nation Nationalities and People Republic (SNNPR), the prevalence of HIV in south Omo zone in Jinka town was 3.4% and 6.5% among pregnant women attending PMTCT and male partners respectively in 2010/2011 and it was high when we compared it with national HIV prevalence which is 2.1%(14).

Determining MTCT of HIV and associated factors is therefore highly beneficial for the intervention activities and the prevention program that our country is thriving to achieve.
There are many studies have been conducted in relation to MTCT in Ethiopia, in spite of that the study that can clearly show the mother- to-child transmission of HIV infection and its associated factor among exposed children in Jinka town has not been previously conducted.
Therefore, the aim of this study is to assess MTCT of HIV and associated risk factors in Jinka town public health facilities.

1.3. Significance of the study

This research could give crucial information since there is no study conducted on Mother to child transmission of HIV infection in Jinka town.

This study would help to fill the gap in identifying factors which associate with MTCT HIV among exposed infants. This report could also be helpful for health professionals working on PMTCT to improve their roles in providing quality care and to have HIV free children for future.

This study will be important to FMoH of Ethiopia, Non-Governmental Organizations (NGOs), South Omo zone health office and other responsible bodies as an input in checking the progress and achievement made regarding PMTCT and to have further intervention.

The study will serve as a source of information for other researchers who are interested to conduct similar study based on primary data in the area and as a reference material.

2. LITERATURE REVIEW

2.1 Introduction

Globally there were 37.9 million People living with HIV and 1.7 million was new infection in 2018/mid 2019. The contribution of under 15 children who was newly infected by HIV accounts 160,000. The majority of which are in sub-Saharan Africa. Every day there are approximately 1,500 new infections in children less than 15years of age, more than 90% of them occurring in the developing world(1,11,15).

2.2 Mother-to-child transmission of HIV

Different scholars strived to write about the MTCT of HIV and associated factors among HIV exposed children. For instance, a retrospective cohort study done in Amazonas, Brazil, reported an overall 6.6% (95% CI: 5.0–8.1) MTCT rate of HIV. According to this study the rate of MTCT of HIV decreased from 7.5% in 2007–2008 to 3.2% in 2011(16). Similarly another prospective cohort study was conducted in Zimbabwe in 2018, reported as, the national cumulative 18-month MTCT rate was 7.0%(17).

Additionally, a cross-sectional study, conducted at Levai Mbatha Community Health Centre in Evaton, Gauteng Province, South Africa reported, rate of mother- to-child transmission of HIV was 4.9% (10/206) among HIV- exposed infants(18).

Another study, a secondary analysis of data collected from a previously published prospective cross-sectional study, conducted at the University College Hospital Ibadan, Southwest Nigeria reported that, prevalence of HIV among children was 10% (60/600), and 93.3% children acquired the infection via mother-to-child transmission (19).

According to the study done at Dil Chora Referral Hospital, in Dire Dawa City Administration, mother to child transmission HIV was 15.7%; most of them 55 (91.7%) were confirmed by DNA-PCR(20).

Additional facility based cross-sectional study was conducted in the Tigray regional state showed that among 340 exposed infants born to HIV seropositive mothers, the overall HIV prevalence was found to be 2.1% (n=7). HIV positivity was higher in infants who did not take ARV prophylaxis

and whose mothers did not enroll to ART care and follow up and infants of mothers who did not take PMTCT interventions during pregnancy or childbirth (P<0.05)(21).

Retrospective cohort study has conducted in selected health facilities of East and West Gojjam Zones, Northwest Ethiopia showed that among 305 HIV-exposed infants,18 (5.9%) were confirmed to be HIV-positive (95% CI). Children who were born from older mothers, infants whose mothers didn't get PMTCT intervention, and mothers who become pregnant after they were aware of their HIV status were the factors associated HIV transmission to the infant.(22).

Similarly, the overall prevalence of DNA/PCR HIV positivity among children born to HIV positive mothers in Oromia Regional State was 7.7%. This 7.7.% MTCTH was slightly lower than study conducted in Amhara region (10.1%and Southwest Ethiopia(17%)(23–25).

In the same way, the research conducted in North West Ethiopia reported that, the prevalence of MTCT of HIV was 3.8% which is lower in comparable with other study conducted in Ethiopia. This may relate to option of PMTCT interventions in HEIs. In that study the participant were received intervention with option B+ which resulted in a low MTCT of HIV as compared with previously implemented options(26).

1.3 Risk Factors Associated with MTCT of HIV

Socioeconomic & Demographic factors

Amount of income can affect MTCT of HIV. In high income countries mother-to-child transmission has been nearly eliminated as a result of effective voluntary testing and counseling, access to antiretroviral therapy, safe delivery practices, and the widespread availability and safe use of breast milk replacement feedings (5).

Facility-based cross-sectional survey conducted in Rwanda showed, from the total sample of 1639 infants with HIV test results, 26 infants were diagnosed Sero-positive. Infant born to mother age older than 25 years and on ART are less likely to be HIV positive. Young mothers (< 25 years old) are imagined to use PMTCT services less than older women(27).

In another study, place of residence affects MTCT of HIV. Infants born to HIV positive mothers from rural residence were three times at higher risk of acquiring HIV infection than those born to

mothers from urban areas. This difference may be related to lack of access to ANC clinics providing PMTCT services in rural areas compared to urban(20).

Obstetric factors

More of Africa Attention is focused on antiretroviral (ARV)-mediated PMTCT among HIV-positive pregnant women. However, studies evaluate that prevention of unintended pregnancies is more effective and efficient than prevention during pregnancy. In women living with HIV(WLHIV), there is additional risk of HIV transmission to the child. ART drugs for HIV-positive women greatly reduce HIV positive births, while ensuring family planning is more effective at a lower cost. It is imperative to strengthen family planning services to reduce unintended pregnancy(28).

Among the obstetric factors, mode of delivery can affect the transmission rate. According to the study done by De Andrade et al, 2016, elective caesarean section were associated with a significantly lower odds of MTCT(16). Additionally, Antenatal prophylaxis in labour was found to be significantly associated with peripartum transmission of HIV. Mothers who received prophylaxis during labour were found to have a significant reduction in MTCT rates among their children compared with those that did not receive prophylaxis in labour(18)**.**

From the study done at Dil Chora Referral Hospital, in Dire Dawa City Administration, infants born at home had a three times higher risk for HIV infection compared to those delivered at health institutions. This could be because the risk of MTCT of HIV infection is minimized when attending skilled delivery in health institutions as it avails opportunities to ARV prophylaxes to the mother during labor and to the newborn right after birth. Regarding home deliveries in this study, 74% of pregnant mothers received PMTCT and only 16% of newborns received ARV prophylaxis at birth(20).

Maternal health

PMTCT services should be offered before conception, and throughout pregnancy, labour and breastfeeding. Keeping women and infants in PMTCT programs after delivery is challenging. In some countries more infant infections are now occurring during the postnatal period due to breastfeeding rather than pregnancy or labor due to the high rates of women who leave care.

Around 1.4 million HIV infections among children were prevented between 2010 and 2018 due to PMTCT programs(5).

Even though most effective strategy to prevent MTCT of HIV infection is through creating public awareness and educating people on HIV; its routes of transmission, methods of prevention and its consequences if acquired, most women of child-bearing age in Mwizi sub-county of Uganda lacked adequate knowledge to prevent MTCT despite high awareness of MTCT and the need for PMTCT. Knowledge about PMTCT for rural women is needed. More training on techniques to reinforce PMTCT messages is needed(29)

The study done in Zimbabwe found that time to initiate maternal ART was related to MTCT. It shows that starting ART preconception and during pregnancy significantly reduced the risk of MTCT throughout 18 months postdelivery by 88% and 58% respectively, compared to mothers without ARVs. Mothers starting ART postdelivery had a 33% reduced MTCT risk compared to mothers without ARV(17).

The findings of Systematic Reviews and Meta-Analyses in Ethiopia showed that HIV positive women with no PMTCT intervention were more than seven fold more likely to have HIV positive child(30).

Child factors

In ideal situations, the provision of ARV prophylaxis and replacement feeding can reduce transmission of HIV from an estimated 15- 45% with no intervention to around 1-2%. In high income countries mother-to-child transmission has been nearly eliminated as a result of access to antiretroviral therapy, safe delivery practices, and the widespread availability and safe use of breast milk replacement feedings (5)

The study done by De Andrade et al, 2016, reported, being breastfed was significantly associated with transmission of HIV infection(16). In contrast to this study, the study conducted in Zimbabwe showed, with high coverage of maternal ART and infant prophylaxis, breastfeeding may not increase MTCT risk (17).

According to the research conducted at South Africa, Infant feeding was identified as a major source of infection. The transmission of HIV through breastfeeding is estimated to be about 10% but when extended prophylaxis with 6 weeks of NVP is given, this transmission rate can be reduced by half(18)

As evidenced by study conducted in Zimbabwe, low birth weight (LBW) were one of the risk factors associated with MTCT of HIV. According to this study HIV exposed infants (HEIs) with LBW were 2.6-fold more likely to acquire HIV from their mothers compared to those with normal birth weight. This is may be due to LBW infants are vulnerable for infection(17).

From the study done at Dil Chora Referral Hospital, in Dire Dawa City Administration, ARV prophylaxis at birth was another determinant factor for MTCT of HIV infection. Infants who did not receive ARV prophylaxis immediately after birth were 5.8 times at higher risk of being infected with HIV than their counterparts(20).

Infants who did not receive co-trimoxazole preventive therapy (CPT) had 7 times more likely to be HIV Positive than those received CPT. This is in line with other studies done in Ethiopia(20), and Southwest Ethiopia(25) this would be due to the risk of bacterial infection and laceration that leads to mucosal barrier breakage and subsequent promotion of viral entry to the blood stream and progression of HIV infection(23).

Clinical factors

A cross-sectional study, conducted at Levai Mbatha Community Health Centre in Evaton, Gauteng Province, South Africa finds maternal CD4 count as a one factor and it revealed that mothers with CD4 count below 200cells/ µl are at increased risk of vertically transmitting HIV to their infants(18).

Other factors

Based on the Rwanda report ,not disclosing HIV status, not testing for syphilis during pregnancy and preterm birth were significant risk factors for MTCT(27).

Even though the Malawi Ministry of Health introduced option B+ as earlier in 2011, which went beyond WHO recommendations at the time, the overall MTCT rate was 3·7% and ranged from

1·4% in women who started ART before pregnancy to 19·9% in women not on ART. This a great disparity shows that in spite of launching policies, MTCT can be minimized through optimal implementation of PMTCT service, addressing HIV positive pregnant women to enrolled in PMTCT clinic and early initiation of ART. To have a good outcome, the guideline for PMTCT required 100% service provision(31).

In addition to that the research conducted in Adama town, Ethiopia, showed that implementation of option B+ PMTCT service can reduce the probability of HIV transmission from mother to child. As the research reported, the overall MTCT was 0.4% and from HIV exposed infants two died(32). This gives a great hope to have zero new HIV infection in 2030 if option B+ PMTCT service has used appropriately.

The Conceptual Frame work of HIV status of exposed infants

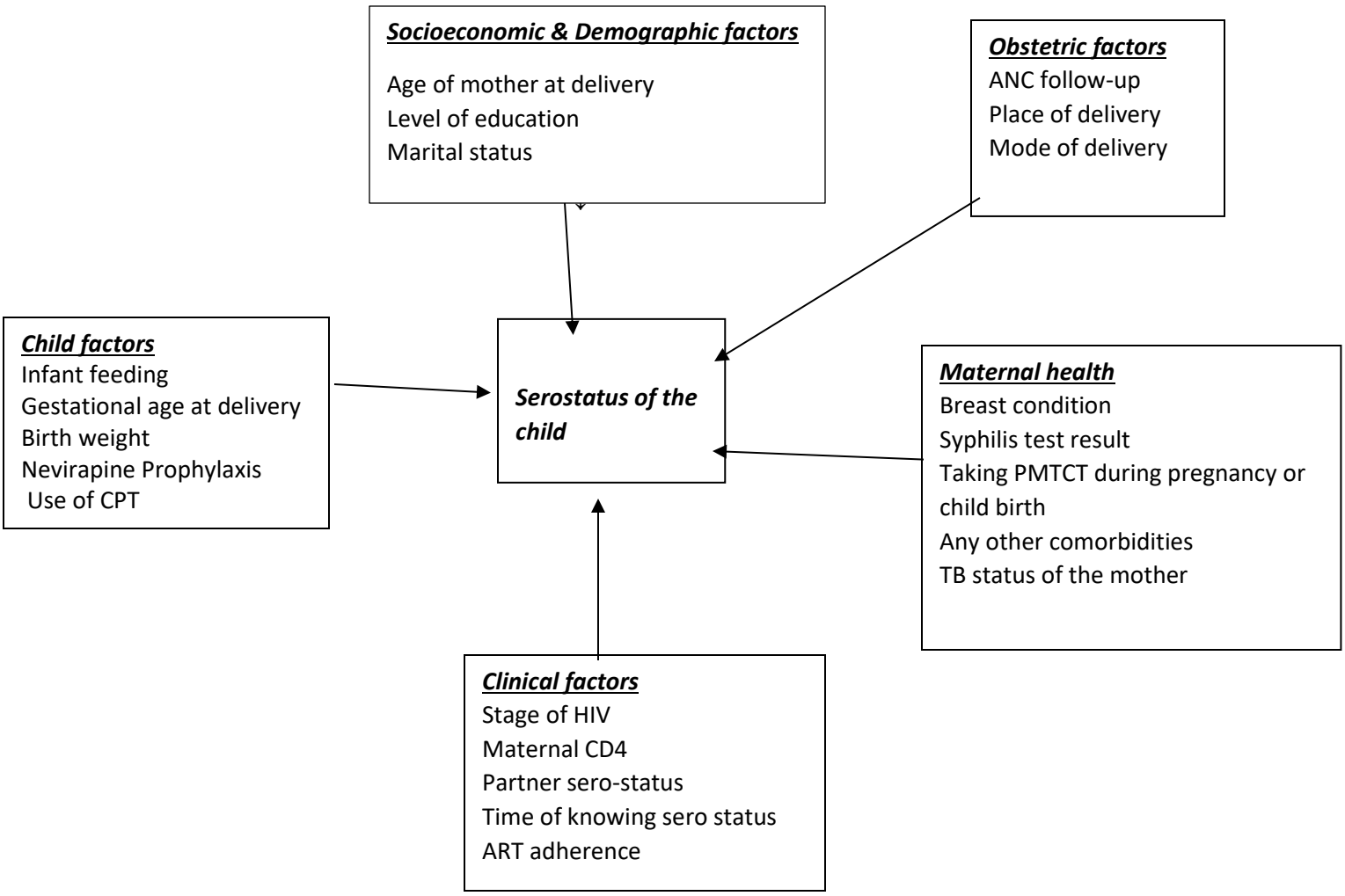

Figure 1: Schematic presentation of conceptual Frame Work of HIV status of exposed infants developed by reviewing related literatures (5,15,29,30,33–35,16–18,20–23,28)

3. OBJECTIVES

3.1 General objective:

To assess Mother- to - Child Transmission of HIV and associated factors among exposed infants on follow-up in Jinka town health facilities, South omo zone, South Ethiopia, 2020.

3.2. Specific objectives:

- To determine the magnitude of HIV transmission from mother to infant in Jinka town health facilities, South omo zone, South Ethiopia
- To determine factors associated with HIV transmission among HIV exposed infants

4. Methods and Materials

4.1. Study area

This study was conducted in South Omo zone, Jinka town, one of the fourteen zones in South Nation Nationality and Peoples' Region (SNNPR). The region is one of the nine region with lowest economic growth. It is 750 KM south of Addis Ababa and 550Km away from the regional capital, Hawassa. The zone is located in 4.430 – 6.460 North latitude & 35.790-36.060 South longitude. The climatic condition ranges from Dega to Kola which constituted 34.4% of the zonal climatic condition. It was a home for 16 tribes, magnificent cultural diversity and afro- traditionalism.

According to the zonal Health Department Annual report, now a day, Jinka town has one general hospital and one Health center. Since 2006 the hospital has been giving integrated ANC- PMTCT service for the pregnant women who have been following ANC service and there are 5 PMTCT trained staff who are actively working in the department. In addition to this, the town has 1 functional health center which has been providing ANC- PMTCT service with 3 PMTCT trained staff. The study was done at Jinka general hospital and Millennium health center.

4.2 Study design and period

Institutional based retrospective cohort study design was used from September/2014 to August /2018 in Jinka town public health institutions.

1.3 Source population and Study population

1.3.1 Source population

The source population are all records of exposed infant-mother pair who were on follow-up at PMTCT clinics in selected public health facilities in Jinka town.

4.3.2 Study population

The study population were records of exposed infants-mother pair who were on follow-up and registered from September/2014 to August /2018 at PMTCT clinics and for which a confirmatory HIV test was done.

4.4 Inclusion and exclusion Criteria

4.4.1 Inclusion Criteria

Infants whose mothers were enrolled in the PMTCT program and HIV exposed infants who had confirmatory HIV test was included.

4.4.2 Exclusion Criteria

HIV exposed infant without confirmatory test during the study period (September/2014 to August /2018) and who had no complete data was also be excluded.

4.5 Sample size determination and Sampling technique

4.5.1 Sample size determination

The sample size determined by using double population proportion formula considering the following assumptions: 95% CI, power 80%, ratio of unexposed to exposed 1:1 and parameters:

P1: is percent of exposed with the outcome

P2: is percent of non-exposed with the outcome

in order to calculate the required sample size. Finally, it is calculated by using Epi info version 7 statistical package.

Table 1 Sample size determination by using double population proportion formula.

Variables	Proportions	Risk ratio	References	Sample size
Residence - Rural (P_1) - Urban (P_2)	P_1=36.6% P_2 = 13.2%	2.77	(20)	Exposed = 61 Unexposed = 61 Total = 122
Duration of mothers ART treatment - ≤4 weeks (P_1) - >4 weeks (P_2) -	P_1 = 18.6% P_2=5.7%	3.26	(23)	Exposed = 115 Unexposed = 115 Total = **230**
ARV prophylaxis at birth - No (P_1) - Yes (P_2)	P_1 = 45.2% P_2= 7.38%	0.16	(20)	Exposed = 26 Unexposed = 26 Total = 52

The total sample size obtained is 230.

4.5.2 Sampling technique

There are only two public health facilities (Jinka General hospital and Millennium Health center) which are providing PMTCT services in Jinka town, and both are selected for the study. The total sample needed is 230. From the total of 312 charts were registered at two health institution (Jinka general hospital and millennium health center) during the study time, there were 245 charts were registered at JGH and 67 charts were registered at the millennium health centers. The samples were allocated proportionally and selected with simple random sampling.

S. No	Period	**Total No. of registered mother- infant pair**			**Number of samples selected**		**Total no. of samples selected**
		JGH	MHC	TOTAL	JGH	MHC	JGH&MHC
1	2014-15	72	10	82	53	7	60
2	2015-16	70	12	82	51	9	60
3	2016-17	43	25	68	32	18	50
4	2017-18	60	20	80	45	15	60
Total		**245**	**67**	**312**	181	49	**230**

Proportionally 230 total sample size allocated for each health facilities with year-based allocation.

Figure 2. Schematic presentation of proportional allocation of samples for each health facilities with year-based allocation.

Finally 228 samples were included in analysis.

4.6 Study Variables

4.6.1 Dependent Variable

HIV sero-status of the baby

4.6.2 Independent Variables

- Socio demographic characteristics (mother age, marital status, level of education, infant age, sex of infant, birth weight),
- Mothers (ANC follow-up, illness during pregnancy, ARV prophylaxis, ART adherence, CD4 count done, WHO clinical stage of HIV, maternal ARV intake prior to current pregnancy, time of mother knew her sero-status, gestational age at the time of dx if newly diagnosed at ANC)
- Place of delivery and Mode of delivery, infant feeding practice,
- Intake of ARV prophylaxis by infants.
- Infants age at which DBS was done

4.7 Data collection instrument and procedure

Data extraction sheet was used to collect data. The data extraction sheet was from the national standard HIV exposed infant follow up chart and PMTCT registration log book which included, socio-demographic characteristics (mother age, marital status, level of education, infant age, sex of infant, birth weight), the PMTCT interventions offered to the mother and her infant, DNA/PCR test done, test results and the first 6 months feeding option of HIV positive mothers for her infant.

The data collection was conducted by the health professionals using the structured data extraction sheets. The data collectors have collected data after they have been given training. The data was collected by reviewing mothers' PMTCT and exposed infants' care and follow-up records at PMTCT clinic.

4.8 Data Quality Control procedures

The data collection has been conducted under close supervision of the principal investigator. The data has been collected by reviewing mothers' PMTCT and exposed infants' care integrated register book at the PMTCT clinic.

Training was given for the data collectors for 1 days prior to the pretest and for 1 day after the pretest. The training includes how to collect data, general objective, relevance of the study, and confidentiality of information. The training conducted in the form of discussion going through the data extraction sheet. To assure the data quality the principal investigator was with the data collectors throughout the data collection making sure they are properly doing so. Moreover; the principal investigator checked all the collected data for completeness, consistency, and clarity during data management, storage, and analysis.

The pre-taste was conducted on a total of 10% of the sample size at respective Health Center and hospital which is selected for the study to make sure it measured what it is intended to measure. After the pre-testing the data extraction format was checked for its clarity, simplicity, understandability and coherency. Correction was made based on the feedback from the data clerks.

4.9 Operational definition of terms

- **Mother to child transmission:** transmission of HIV from HIV positive mother to her infant during pregnancy, delivery and during breastfeeding.
- **Prevention of mother to child HIV transmission:** Are prevention activities that prevent the virus transmission to the baby during pregnancy, labor and delivery or breastfeeding and provision of care and support.
- **Sero-positive:** a child with positive DNA/PCR /antibody after 18 months HIV test result.
- **Sero-status:** if the antibody and or DBS test result indicated positive or negative for HIV during the follow-up period of 18 months as indicated by the infant registration card.
- **Exposed infant:** an infant who was born from the HIV-positive mother.
- **Adherence: Good: -** if the client missed <= 2 doses

  Fair: -if the client missed 3-5 doses

  Poor: -if the client missed >=6 doses

➢ 4.10 Data processing and analysis

The collected data have been checked for its completeness then coded and the data entered in Epi Data 4.2 version and final analysis was done using SPSS version 25. Descriptive statistics used to describe each individual variable using mean, standard deviation and other methods. Then after, bivariate logistic regression analysis was computed for each predictor variable with HIV sero-status of the baby. Then variables associated with HIV sero-status at 0.25 significant levels included in the multivariable logistic regression analysis. Both Crude Odd Ratio (COR) and Adjusted Odd Ratio (AOR) with 95% CI was used to identify predictor variables. Variables, which had p-value < 0.05, considered as significant. Lastly, results has summarized and presented in graphs and tables

4.11 Ethical consideration

Letter of ethical clearance have obtained from the ethical review committee of school of Nursing and Midwifery, Addis Ababa University but institutional permission letter was requested and attained to review records of HIV positive mothers and their infants.

Confidentiality of patient information is ensured as the names or identification number of study participants isn't included in the data extraction format and the extracted data from charts would not be subjected to third party.

4.12 Dissemination of study

The result of this research will serve as the resource material for researchers and policy makers. To achieve these goals, the result of this study will be:

- submitted and presented to Addis Ababa University, School of Nursing and Midwifery as a partial fulfillment of masters in pediatric and child health nursing.
- Submitted to Jinka General Hospital.
- Submitted to Millennium health center, Jinka town.
- Given to Jinka city administration health bureau and NGOs
- Will also be presented in locally or internationally held seminars, workshops, conferences and meetings including in Ethiopian nursing association.
- Finally, it will be published in nationally or internationally recognized journals

5. RESULTS

5.1. Socio demographic characteristics of the mother and HEIs

This study included 228 exposed infant and their mother who enrolled to PMTCT clinic in four consecutive years (September 2014 to August 2018) in Jinka town public health facilities. The data was collected from two health facilities, Jinka general hospital (JGH) and Millennium health center (MHC). Most of the data was collected from JGH. The age of the participant mothers ranges from 17 to 37 with the mean ±SD was 26.13±5.304 years. Majority of them (59.6%) were aged between 25 and 37 years old. Concerning to level of education, nearly half (47.4%) were illiterate. Almost all mothers were married 225(98.7%) while 1.3% were single and 57% of the mother were multipara. Most (137,60.1%) of HEIs were female. Of the total, 94.7% of HEIs had delivered at gestational age ≥ 37 weeks and 95.2%of HEIs had ≥ 2500g birth weight. Table 2.

Table 2. Socio-demographic characteristics of HEIs and their mothers, in Jinka town health facilities, south Ethiopia, 2020. (N=228)

Variable	categories	Frequency (n)	Percentage
Age of mother	17-24	92	40
	25-30	61	26.8
	31-37	75	32.9
Level of education	illiterate	108	47.4
	Read and write	18	7.9
	Primary	64	28.1
	Secondary	16	7.0
	Tertiary	22	9
Marital status	Single	3	1.3

	Married	225	98.7
Parity	≤3 children	213	93.4
	4-7children	15	6.6
Gestational age at the time	32-36 wks	12	5.3
of delivery	37-42	216	94.7
birth weight of the infant	2000-2499gs	11	4.8
	2500-4000gs	217	95.2
Sex of the infant	Male	91	39.9
	Female	137	60.1

5.2 PMTCT intervention given for the mother

From the total, 144/228 (63.2%) of mothers attended antenatal care during current pregnancy and out of these 98/144 (68%) had three or more visits and 84 (36.8%) are missing (those who had no ANC follow-up).

From the total mothers participated in the study, 170 (74.6%) were already on ART follow-up at enrollment. The remaining 25.4% were newly diagnosed during current pregnancy with gestational age at the time of diagnosis ranges from 6-39 weeks and the mean gestational age at the time of diagnosis was 23.60 weeks. For 217(90.8%) of the mother syphilis test was done during prenatal, intrapartum or postnatal period. From that 3.5% reported as positive and 199/217 was negative, the remaining 21/228 not tested for syphilis at all. (Table 3)

Two hundred and eleven (92.5%) of the mother had given birth at health institution and 7.5% at home, 75.9% had SVD. Of the total mothers participated in the study, 70.2% of them were on ARV prior to current pregnancy. For 82.5% of the mothers ART was initiated during this pregnancy, more than three fourth of them had good adherence to ART. Out of these, 161(70.6%) of them were taking highly active ART treatment. Twenty percent of the couples (n=33/162) were sero-discordant. The majority 148/170 (87.1%) of mothers, had a CD4 count ≥351/$mm^{3.}$ Except one participant mother, all others had no recorded comorbidity during pregnancy. Regarding WHO stage more than half (61.4%) of the mother were stage I. Only 30 (13.2%) of the mothers were

prescribed cotrimoxazole prophylactic therapy (CPT), 26 had good adherence to CPT. The proportion of mothers who tested positive for tuberculosis (TB) was (n=12, 5.3%). Almost all (99.6%) of breast-feeding mothers had normal breasts. Table 3.

Table 3. PMTCT intervention given for the mother in Jinka town health facilities, south Ethiopia, 2020. (N=228)

Variables	Categories	Frequency	Percentage
ANC follow-up	Yes	144	63.2
	No	84	36.8
No of ANC follow-up	1	12	8.3
	2	34	23.6
	3	50	34.7
	4	48	33.3
Time the mother knew her sero-status	Newly diagnosed	58	25.4
	Confirmed + priorly	170	74.6
Gestational age at DX	1-12	5	2.2
in weeks	13-24	29	12.7
	25-39	24	10.5
syphilis test result	Positive	8	3.5
	Negative	199	87.3
	Not tested	21	9.2
Place of delivery	JGH	140	61.4
	MHC	35	15.4
	Home	17	7.5
	Other health facility	36	15.8
Mode of delivery	C/S	40	17.5
	SVD	173	75.9
	Instrumental	15	6.6
Mother on ARV prior	Yes	160	70.2
to current pregnancy	- No	68	29.8
Time in which ART drug	-During pregnancy	188	82.5

initiated for the mother	-During labor/delivery	39	17.1
	-After delivery for short period of time	1	0.4
Partner sero-status	Reactive	129	56.6
	Not reactive	33	14.5
	Not tested	66	28.9
Maternal initial CD4 count	<200/mm3	3	1.8
	201-350/mm3	19	11.2
	>350	148	87.1
WHO stage of mother	I	140	61.4
	II	78	34.2
	III	10	4.4
Mother took CPT	Yes	30	13.2
	No	198	86.8
ART adherence	Good	179	78.5
	Fair	11	4.8
	Poor	38	16.7
Mother's TB status	Positive	12	5.3
	Negative	216	94.7

5.3 PMTCT intervention given for the infant

Concerning infant feeding practice in the first six months, 227(99.6%) of HEIs stated as exclusive breast feeding while 0.4% received mixed feeding. HIEs were given NVP syrup after birth (96.5%), the remaining were not given NVP as well as CPT. DNA/PCR test was done for 76.8% of the HEIs by 6 weeks of age, 94.6 % of HEIs were discharged as negative after 18 month or cessation of breast feeding. (Table 4)

Table 4. PMTCT intervention given for the infant in Jinka town health facilities, south Ethiopia, 2020. (N=228)

Variables	Categories	Frequency	Percentage
Infant ARV prophylaxis	Yes	220	96.5

	No	8	3.5
Infant feeding practice	EBF	227	99.6
	Mixed feeding	1	0.4
Child received CPT	Yes	217	95.2
	No	11	4.8
Types of test done for the infant			
	Only antibody test after 18 months	23	10.1
	Both DNA/PCR and Antibody test after 18 months	205	89.9
DBS test result	Positive	9	3.5
	Negative	195	85.5
	Not recorded	24	10.5
Age at which DBS test done	At 6 weeks	175	76.8
	After 6 weeks	26	11.4
Status of infant after 18mnz	Positive	12	5.3
	Negative	216	94.6

Factors Associated with MTCT of HIV

Bivariate and Multivariable Analysis of Factors Associated with MTCT of HIV

In the bivariate analysis, factors associated with MTCT of HIV (p-value <0.2) were mothers ARV prior to current pregnancy, maternal ART adherence, gestational age at the time of delivery, marital status, child CPT at birth, infant ARV prophylaxis at birth, ANC follow-up, time in which the mother knew her sero-status, WHO stage of the mother when enrolled to PMTCT and initial CD4 count of the mother when enrolled to PMTCT.

Mothers who were not on ART prior to current pregnancy, who have poor ART adherence, who has delivered before 36 weeks gestational age, who were single during pregnancy, who did not have ANC follow-up, knew as she was HIV positive lately, who were at advanced WHO clinical stage at the time of enrollment to PMTCT, and with low CD4 count were more likely to give HIV positive birth than their counterparts. In addition to that, infant who did not took CPT as well as NVP syrup after birth were more likely to be positive than their counterparts.

After controlling the effect of all the other variables using multivariable logistic regression, infant who did not receive ARV prophylaxis at birth were 5.9 times more likely to be positive than infant who received ARV prophylaxis (AOR=5.8, 95% CI: 1.02-33.53, p=0.047).

Mothers who were not on ARV prior to current pregnancy were 5.7 times more likely to transmit the virus to their infant compared with mothers with ARV intervention prior to current pregnancy (AOR=5.6,95% CI: 1.14-28.1, P=0.034).

The other factor with p<0.05 was mother's advanced WHO clinical stage of HIV at enrollment to PMTCT. Mothers who were at WHO clinical stage III at enrollment were more than 10 times more likely to transmit HIV to their infants than Mother who enrolled to PMTCT care at stage I (AOR: 10.5; 95% CI: 1.4,81, p=0.022). (Table 5)

Table 5. Factors Associated with MTCT of HIV in Jinka town health facilities, south Ethiopia, 2020. (N=228)

Variables	Category	HIV Status of Infants		COR (95%CI)	P.value	AOR (95% CI)	P.value
		Positive	Negative				
Mother on ARV prior to current pregnancy		N(%)	N(%)				
	Yes	4(2.5)	156(97.5)	**1**			
	No	8(11.8)	60(88.2)	5.2(1.51-17.9)	0.009	5.66(1.14-28.1)	0.034
Maternal ART adherence	Good	6 (3.4)	173(96.6)	**1**			
	Fair	1(9.1)	10(90.9)	2.88(0.31-26.3)	0.034		
	Poor	5(5.3)	33(86.8)	4.36(1.25-15.15)	0.02		
Child CPT	Yes	10(4.6)	207(95.4)	**1**			
	No	2(18.2)	9(81.8)	4.6(0.87-24.15)	0.071		
Infant ARV prophylaxis	Yes	5(2.3)	215(97.7)	**1**			
	No	7(87.5)	1(12.5)	7.81(2.08-29.37)	0.002	5.8(1.02-33.53)	0.047
Mothers ANC follow-up	Yes	5(3.5)	139(96.5)	1			
	No	7(8.3)	177(91.7)	2.5(0.77-8.25)	0.124		
WHO stage of the mother	I	5(41.7)	135(62.3)	1			
	II	4(33.3)	74(34.3)	1.45(0.03-5.6)	0.582	1.05(0.2-4.9)	0.943
	III	3(25.0)	7(3.2)	11.57(2.28-58.5)	0.003	10.7(1.4-82.3)	0.022
Time the mother knew her serostatus	Confirmed +ve priorly	4(2.4)	166(97.6)	1			
	Newly diagnosed	8(13.8)	50(86.2)	6.6(1.9-22.9)	0.003		

6. Discussion

Prevention of MTCT of HIV infection requires early diagnosis of mother at ANC and intervention as well as early infant diagnosis and preventive intervention. It is one of major public health agenda in our country, Ethiopia. Hence the aim of this study was to assess rate of Mother- to - Child Transmission of HIV and associated factors among exposed infants on follow-up in Jinka town South, Ethiopia. According to this study, 5.3% of HEIs got HIV infected.

The prevalence was high when we compare with the study conducted in Rwanda, Malawi, Adama town and Dessie town, (1.58%,3.7%, 0.4% and 3.8% respectively) (26,27,31,32). The high prevalence was may be due to low level of maternal knowledge regarding MTCT of HIV and usage of HIV drugs during pregnancy since 47.4% mothers were illiterate in this study. Other factors which may contribute for this high prevalence were sexual culture of the community, life style, body cutting practice, harmful traditional practice of the society and HIV is more prevalent among pastoralist community where there are different tourists visiting and exposing to occupational risks and also due to the mobile nature of the pastoralist community. In spite of that health institution setup, lack of trained health professionals, socioeconomic status of the study participant may also contribute for these disparities.

In another way, the prevalence was low when we compare it with the study conducted in Belgaum district, Karnataka, India(7.8%), 6.6% in Brazil, 11.6% in Bertoua, Eastern Cameroon(16,36,37) and other parts of Ethiopia, 7.7% in Oromia, 10% in Gondar 10.2% in South Gondar zone, 15.7% in Dredawa, 5.9% in East and West Gojjam zones, Northwest Ethiopia (20,22–24,38). This might be due to the time difference of the study. This study conducted at the time with high coverage of PMTCT intervention with option B+ strategy as well as ART coverage for pregnant mother and HEIs as well. These may give a great importance to reduce rate of MTCT of HIV infection. In addition to that this study conducted at the time of good infrastructure to access health service when we compare it with the previous studies in Ethiopia.

When we come to determinant factors of MTCT, infant ARV prophylaxis was significantly associated with MTCT of HIV. HEIs who did not receive ARV prophylaxis at birth were 5.9 times more likely to be positive than infant who have received ARV prophylaxis after birth (AOR:5.9;95% CI: 1.04-33.5). Similar studies in Ethiopia have also supported as infant ARV

prophylaxis as an independent predictor of MTCT of HIV (20,23,26). The scientific justification for this finding might be the viral suppression effect of nevirapine syrup.

In other way, mother's advanced WHO clinical stage of HIV at enrollment to PMTCT significantly associate with MTCT of HIV. Mothers who were at WHO clinical stage III at enrollment were more than 10 times more likely to transmit HIV to their infants than Mother who enrolled to PMTCT care at stage I (AOR: 10.5; 95% CI: 1.4,81). It is also reported by related studies conducted in Ethiopia, mainly in Addis Ababa(39) And Jimma(40). Possible justifications for this might be, mother in advanced clinical stage may develop different opportunistic infection, they may become immunodeficient as well can have high viral load and the transmission rate may increase.

According to the findings of this study, mothers who were diagnosed positive but not on ARV prior to current pregnancy were more than five folds at high risk to give HIV positive child than mother who were on ARV prior to current pregnancy (AOR: 5.68; 95% CI:1.15,28.1). This study is consistent with the research conducted in Dessie town (26). This might be due to higher viral load during earlier stages of pregnancy will be a significant risk factor for mother to child transmission of HIV infection. For that matter, taking ARV prior to pregnancy may suppress the viral load and prevent transmission of HIV to the fetus. In addition to this, mother who took ART drug priorly may have good awareness about how to take it and may adherence to it well.

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6.1. Strength and limitation of the study

6.1.1 Strength of the study

The strength of this study includes:

- ✓ Using a four-year record to increase representativeness
- ✓ Incorporates samples from health center and hospital to increase representativeness

6.1.2. Limitation

The study was simply based on secondary data, so some variables were missed in record which may associate with MTCT of HIV.

Other limitations of this study include:

- ✓ Time limitation related to CoViD-19 pandemic which results limitation of transportation during data collection period as well it limits face to face communication with advisors.

CHAPTER-7: CONCLUSION AND RECOMENDATION

7.1. Conclusion

The study reports higher risk of HIV infection among exposed infant in the study area. Infant did not receive NVP prophylaxis at birth, mothers who were at advanced WHO clinical stage of AIDS, and mothers who did not received ARV prior to pregnancy were at higher risk of mother to child transmission of HIV infection. Therefore, to prevent mother to child transmission of HIV infection, early diagnosis and treatment of women who are at child bearing age, promoting HIV positive mothers to take ART drug properly, and early initiation of ARV prophylaxis for exposed infants is beneficial.

7.2. Recommendation

Based on the finding, the following recommendations have been forwarded for each respective bodies: -

To Federal Ministry of Health (FMoH)

The federal ministry of health had better to strength prevention of new HIV infection among reproductive age group women and early screening at outpatient department and at youth friendly service department.

To Jinka general hospital and Millennium health center

Since the transmission rate is high, the hospital and health center administrator should adjust in service training inspirational program for health care providers.

To Future researchers: As this is institution based retrospective secondary data analysis, it is better to use prospective cohort study design for better information including other factors not included under this study such as mother's knowledge about MTCT, the time for seroconversion, and other socioeconomic factors.

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Annexes

Annex I: Data extraction Sheet

Part I: socio demographic characteristics of the mother

Mother / infant code number _____ / _____

1	What was the age of the mother? _____years (in completed year)
2	What was the level of education of the mother? A. Illiterate B. Read and write C. Primary D. Secondary E. Tertiary F. Not recorded
3	What was the marital status of the mother? A. Single B. Married C. separated/ divorced/ Widowed D. Not recorded

Part II: Information to be extracted from Maternal Records

4	What was Mid upper arm circumference (MUAC) of the mother at 6th month follow up? _____
5	What was MUAC of the mother at 12th month follow up? _____
6	What was MUAC of the mother at 18th month follow up?
7	What was gravidity of the mother? _____

8	What was parity of the mother? _____
9	Did the mother attend antenatal care clinic during pregnancy of this infant? A. Yes B. No C. Not recorded
10	If yes for question number 9, how many visits? _____
11	Did the mother take PMTCT prophylaxis during ANC? A. Yes B. No
12	What was mode of delivery? 1. Emergency Cesarean section 2. Elective Cesarean section 3. Spontaneous vaginal delivery 4. Instrumental delivery 5. Episiotomy
13	When did the mother knew her HIV sero status? 1. Newly diagnosed during current pregnancy 2. Confirmed positive prior to current pregnancy
14	What was the gestational age at the time of diagnosis? _____
15	What was her Syphilis test result during Antenatal care follow-up? 1. Positive 2. Negative 3. Not done
16	Date of delivery_____
17	Place of delivery 1. Delivered at same facility 2. Delivered at another facility 3. Home delivery 4. Others(specify)_____
18	Duration of labor in hours_____
19	Was the mother on ARVs prior to pregnancy with this infant?

	A. Yes B. No C. Not recorded
20	If yes for question number 9, please specify which ones? A. AZT + 3TC during pregnancy B. Sd-NVP at the onset of labor C. HAART (1c,1e,1d,1f) D. None taken E. Not recorded
21	When ART drugs initiated for the mother? A. During pregnancy B. During labor/ delivery C. After delivery for a short period of time D. During breastfeeding E. Not recorded
22	ART unique ID #? _____
23	What was the partner's sero status? 1. Reactive 2. Not reactive 3. Not tested
24	Initial CD4 count of the mother when enrolled to PMTCT? _____
25	Is there any illness during pregnancy? A. Yes, specify it_____ B. No C. Not recorded
26	What was the WHO stage of the mother when enrolled to PMTCT? A. I B. II C. III D. IV E. Not recorded

27	Did the mother take Cotrimoxazole prophylaxis therapy (CPT)? 1.Yes 2. No
28	What was TB status of the mother? A. positive B. negative C. Not recorded
29	Infant feeding practice within the first 6 months of life? A. Exclusive breast feeding B. Mixed feeding C. Exclusive infant formula milk D. Not recorded
30	Mother's Breast condition; if breast feeding 1. Normal 2. Cracked nipples 3. Mastitis 4. Breast Abscess 5. Other (specify): _____
31	ART adherence 1. Good 2. Fair 3. Poor
32	Cotrimoxazole Prophylaxis Adherence 1. Good 2. Fair 3. Poor

Part III. Information to be extracted from infant health records

33	What is sex of infant? A. Male B. Female C. Not recorded
34	Gestational age at delivery in weeks? _____
35	What was the birth weight of the child in grams? _____
36	Did child receive ARV prophylaxis? A Yes B. No C. Not recorded
37	If yes for question number 36, What drugs were given for the child? A. NVP syrup B. AZT syrup C. AZT+ 3TC D. Not recorded
38	Did the child take Cotrimoxazole prophylaxis? 1. Yes 2. No
39	Has the child been tested for HIV? A. Yes B. No C. Not recorded
40	If yes for question #39, what types of HIV test was done? A. DNA/PCR B. Antibody test after 18 months C. Both DNA/PCR and Antibody test after 18 months
41	What was the DBS (DNA/PCR) result?

	A. Positive B. Negative C. Not recorded
42	At what age was DBS (DNA/ PCR) done? _____
43	What was the status of the child after 18 months? A. Positive B. Negative C. LTFU D. Drop E. Dead (if died write date of death) _____/_____/_____ F. Not recorded
44	If question # 41 and /43 is positive, date confirmed HIV+ _____/_____/_____(DD/MM/YY)
45	If question number 41and /43 is positive, has CD4 been done for the child? A. Yes B. No C. Not recorded
46	If CD4 test done, please state the result_____?

47	Is child being on ART for treatment? A. Yes B. No C. Not recorded
48	If on treatment, please state drugs given for the child? A. AZT, 3TC, NVP B. AZT, 3TC, LPV/R C. ABC, 3TC, NVP D. Other specify……. E. Not recorded

Name of data collector _____ Signature: _____Date:_____

Supervisor's Name: _____ **Title of the study:** Prevalence rate **of** Mother- to-child transmission of HIV and associated factor among exposed infants on follow-up in Jinka town public health facilities, south omo zone, south Ethiopia, 2020.

Annex II. Information sheet and Consent

Name of Investigator: Kidist Tadewos (BSc.)

Name of the Organization: AAU

Introduction; This information sheet is prepared for Jinka General hospital and Jinka millennium health center ANC/PMTCT coordinators. The aim of the form is to make the above concerned offices clear about the purpose of the research work, data collection procedure and get permission to undertake the research.

Purpose of the Research Project: To assess Prevalence rate mother- to-child transmission of HIV and associated factor among exposed children on follow-up care in Jinka town health facilities.

Procedure: In order to achieve the above objective, the record (PMTCT registration book, mother chart, and infant chart) of exposed infant mother pair who were on follow-up at PMTCT clinics and registered from September/2014 to August /2018 will be reviewed by using check list.

Risk and/or Discomfort: By participating in this research, there is no risk will come to the ANC/PMTCT clinic in general and the client whose record will be reviewed. Whereas the review is of great important to the research.

Benefit: The research will have no direct benefit to those who participate in this project. But the indirect benefit of the research for the participant and all other clients in the program is great. As identifying area of improvement and taking appropriate decision helps to improve the service, increase access and overall effectiveness of the program and reduce MTCT of HIV infection.

Confidentiality: To keep the confidentiality the name of client will not be mentioned rather code number will be used and to prevent access unauthorized person the information will be secured in personal computer with password.

Person to contact: If at any case you want to know about the research you can contact the principal investigator by using the following address.

1. Kidist Tadewos (BSc), Principal investigator
   Tel: 251-926352604 e-mail: kidisttadewos22@gmail.com

AAU University, College of Health Sciences, school of nursing, Department of nursing and midwifery.

Signature: _____ Date: _____