Original Article

Maternal Transmission of Human Immunodeficiency Virus to Infants in A Tertiary Care Hospital in Pakistan

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ABSTRACT

OBJECTIVE: To determine frequency of transmission of HIV from mother to child at Aziz Bhatti Shaheed Teaching Hospital Gujrat.

METHODOLOGY: Cross-sectional study conducted at Aziz Bhatti Shaheed Teaching Hospital Gujrat in Department of Gynecology and Obstetric Unit II from January 2012 to March 2019 using non-probability consecutive sampling. Patients who tested positive for HIV and reached full term were included. Mothers were started ART at time of diagnosis. Infant prophylaxis was done according to WHO guidelines. Counseling regarding breastfeeding was done. HIV status of infants was noted at 12 weeks after birth. A total of 51 patients were included. SPSS 20.0 was used for data analysis.

RESULTS: Fifty-one patients included having mean age 29.45+3.15 years. All patients were diagnosed during pregnancy. ART was initiated in 17(33.3%) in first trimester, 10(19.6%) in second trimester, 20 (39.2%) in third trimester and in 4(7.8%) post-partum. At 6 weeks follow up of mothers, 46(90.2%) were stable, 3(5.9%) lost to follow up and 2(3.9%) mothers died post-partum at home. At 12 weeks follow up of infants 39(76.5%) tested negative for HIV, 2(3.9%) were tested positive, 7(13.7%) lost to follow up and 3 (5.9%) infants died during this period. In alive and tested infants 2 out of 41 were tested positive, making HIV transmission to children from mothers to be 4.9%.

CONCLUSION: HIV transmission to children form mothers is high in our population and there is need for active screening of all pregnant mothers.

KEY WORDS: Mother to Child HIV Transmission, HIV, HIV in Infants, Pregnancy, AIDS

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INTRODUCTION

Human immunodeficiency virus (HIV) poses major medical problem globally affecting more than 35 million lives till date. It has claimed 940000 lives in only in 2017 worldwide[1]. In Pakistan almost 0.15 million people are affected with HIV which include 43000 women of child bearing age[2]. A recent outbreak has been reported in Sindh province of Pakistan where more than 607 people are HIV positive in a single city out of which >75% are children[3]. Although reuse of syringes has been implicated in this scenario but it has created a debate about underreporting of HIV cases in Pakistan, presumably the number of cases in Pakistan maybe higher than reported to National AIDS Control Program and WHO data sheets.

HIV transmission to child may occur during pregnancy, at the time of delivery or through breastfeeding the infant from their mothers. Before the advent of anti-reteroviral therapy (ART) this transmission was reported to be from 24%[4] to 39%[5] in 1980s. However, with availability of ART these rates are declining[1]. Studies have shown that HIV transmission to child from mother occurs in 20% to 35% in breastfed infants and from 15% to 20% in non-breastfed infants without intervention[6]. The WHO guidelines[7] suggest that ART should be started in all pregnant mothers disregarding clinical stage of HIV and CD4 count. Infant prophylaxis should be initiated in high risk infants born to HIV positive mothers. Current regimen in infants includes ziduvidine and nevirapine for first 6 weeks.

In developed countries like United Kingdom the rate of HIV transmission to children from mothers was reduced to approximately 0.45% during 2006-2013[8]. This has been possible due to effective intervention in mothers and prophylaxis in infants. Another recent study conducted in South Africa shows that initiation of ART early in pregnancy to mothers diagnosed during pregnancy led to reduction of mother to child transmission of HIV[9]. In Myanmar 2% infants were found to have maternal transmission of HIV after effective treatment[10]. Maternal HIV transmission to children in India is reported to be high at 5.9% till 2013[11]. One study in Pakistani children with HIV showed that parent to child transmission is a

significant contributing factor for their infection[12].
However there are no studies available in Pakistan regarding maternal transmission of HIV to children. HIV is underreported due to social stigmata associated with this and people do not seek medical advice regarding this issue. There is need for studies in this issue. The aim of study is to determine the evidence regarding maternal transmission of HIV to infants. Thus the study objective is to determine frequency of transmission of HIV from mother to child at Aziz Bhatti Shaheed Teaching Hospital (ABSTH) Gujrat.

METHODOLOGY

This was a cross-sectional study performed at Aziz Bhatti Shaheed Teaching Hospital Gujrat in Department of Gynecology and Obstetric Unit II from January 2012 to March 2019 after approval of ethics committee of hospital and informed consent of patients. Mothers who were HIV positive were included using non-probability consecutive sampling technique. Screening of all pregnant patients was done. Those who tested positive on screening were given pre-test counseling and ELISA for HIV was done to confirm the diagnosis. Patients tested positive if not taking previously were started recommended ART regimen after post-test counseling. ART used was combination of daily dose Lamuvidine 150mg, Ziduvidine 300mg and Nevirapine 200mg (Duovir-N) available at PMTCT center of hospital. Patients who presented and were diagnosed with HIV at the time of delivery were started ART post-partum due to unavailability of infusions form of drugs. Duration and trimester of initiation of ART was noted.
HIV testing of spouse was also done after counseling. CD4 counts were sent of all patients. All patients were followed up for duration of pregnancy. Those who had abortions or lost pregnancy due to others reasons were excluded from study. Mode and place of delivery were noted. Gender of full term delivered infants was also noted. Mothers were counseled not to breastfeed the infants and response was noted in the follow-up. Infant prophylaxis was started by using Nevirapine drops orally once daily for 6 weeks. Children were tested for HIV at age of 12 weeks using ELISA. Seropositivity of HIV was noted and those who tested positive were started on lifelong ART. All data was recorded on predesigned proforma. SPSS 20.0 was used for analysis of data. Continuous variables for example duration of ART or age were expressed as mean+SD and categorical variables were expressed as percentage.

RESULTS

Fifty-one patients who gave birth to full term infants were included in study. Mean age of mothers was 29.45±3.15 years. All patients were positive for HIV on screening as well as ELISA for HIV during pregnancy. Their HIV status before pregnancy was unknown. Pre-test and post-test counseling was done in all patients. Spouses of 26 (51%) were tested positive for HIV, 18 (35.3%) were tested negative and 7 (13.7%) did not undergo HIV testing (HIV status unknown). ART was initiated in 17 (33.3%) in first trimester, 10 (19.6%) in second trimester, 20 (39.2%) in third trimester and in 4 (7.8%) post-partum. Mean duration of ART was 136.54+80.82 days. Delivery in hospital was done in 45 (88.2%) and 6 (11.8%) delivered at home. C-section was done in 26 (51%) patients and spontaneous vaginal delivery in 25 (49%) patients.
Male infants were delivered in 24 (47.1%) and female infants in 27 (52.9%) mothers. All mothers were counseled regarding breastfeeding of infants. Infant prophylaxis was started in all patients and patients were called for follow up. At 6 weeks follow up of mothers, 46 (90.2%) were stable, 3 (5.9%) lost to follow up and 2 (3.9%) mothers died post-partum at home. Breastfeeding was being done in 21 (45.65%) who showed up for follow up despite counseling against it. No cause of their death among mothers could be established.
At 12 weeks follow up of infants and HIV testing by ELISA, 39 (76.5%) tested negative for HIV, 2 (3.9%) were tested positive, 7 (13.7%) lost to follow up and 3 (5.9%) infants died during this period (deaths reported on telephone) depicted in Table I. In alive and tested infants 2 out of 41 were tested positive, making maternal transmission of HIV to children to be 4.9%.

TABLE I: HIV TESTING OF INFANTS AT 12 WEEKS POST-PARTUM

HIV Testing at 12 weeks	Frequency	Percent	Valid Percent	Cumulative Percent
Negative	39	76.5	76.5	76.5
Positive	2	3.9	3.9	80.4
Loss to Follow-up	7	13.7	13.7	94.1
Baby Died	3	5.9	5.9	100.0
Total	**51**	**100.0**	**100.0**	

DISCUSSION

This study shows that there is under-diagnosis of HIV in our population as all patients were diagnosed during pregnancy screening and were initiated ART. The maternal transmission of HIV to children is higher compared to developed nations but similar to other

countries of South Asia.

Most of patients were of young age with more than half of spouses having HIV infection. This is an alarming situation as none of them was diagnosed with HIV before. The causes attributed to this transmission include male and female sex workers, injection drug users, unsterilized medical practices, barber shops and beauty salons with unsterilized instruments and mother to infant transmission[12]. Although national reported prevalence of HIV in Pakistani population is 0.2, [2] but one study performed in Faisalabad depicted a higher ratio among respondents (0.557)[13]. This has been pointed out by author's previously[14]. There is a need to start an awareness campaign regarding HIV/AIDS as one local study showed decreased awareness among uneducated individuals compared to educated[15].

The trend of initiation of ART also shows that most of pregnant patients do not show up for booking visit with their doctors. Most of patients were started ART in second trimester and onwards. Despite the diagnosis of HIV a small number of patients did not come to hospital for delivery. Similarly almost half of patients continued breastfeeding infants despite counseling. About 13.7% infants lost to follow up after delivery. This is again attributed to decreased awareness among population about possible consequences of HIV[15]. The social stigmata associated with diagnosis of HIV also pose a problem towards the treatment among patients. One recent study showed that people having more knowledge about HIV have less discrimination towards HIV patients compared to those having a poor knowledge[16] showing a need for comprehensive national awareness campaign.

Mother to child transmission rate was high among our study group (4.9%). However one Pakistani study retrospectively demonstrated the rate to be 3.64% lower than this study[12]. This rate is very high than western world where maternal transmission to children is declining over the period of time[8]. This is due to undiagnosed cases in our study group, lack of intravascular treatment with zidovudine and lack of education among patients regarding taking ART. Another study in Malawi concluded that maternal transmission of HIV was 2.6%. However this was confirmed at 30 months age of children and more than half of patients lost to follow up[17].

This transmission was very high in early studies. One study conducted in France demonstrated the rate of maternal transmission of HIV to infant to be 16%.[18] Nairobi study determined this transmission rate to be 42.8%.[19] However when these studies were conducted, patients were breastfeeding their children and most of infections in children were attributed to breastfeeding. Furthermore ART was not available at that time.

Another study in Ethiopia showed high maternal HIV transmission rates to children (15.7%) which they attributed to mixed feeding, rural residence, birth at home, no infant or mother prophylaxis[20]. It shows that attitude of our patients is similar in case of home birth, mixed or breast feeding and loss to follow up from ART. Adding this to under-diagnosis and social practices in our population HIV may be considered as ticking bomb that will explode anytime.

Mother to child transmission in Kenya varied with time. During 2007-2010, 11.1% infants were HIV positive with reduction in rate to 6.9% from 2014-2015.[21] These rates of transmission are higher than depicted in this study (4.6%). This may be due to smaller sample size in this study and furthermore there was lack of intervention regarding ART in their study. One meta-analysis conducted in Ethiopia showed mother to child transmission of HIV to be 9.93% which is higher than results of this study[22]. The factors associated with this high rate of transmission included absence of infant prophylaxis or maternal ART treatment along with mixed feeding practices and home delivery.

However, maternal HIV transmission rates are almost similar to as reported in India (5.6%)[11] but higher than other countries of South Asia[10]. One meta-analysis determined that countries with low prevalence of HIV (<5%) have higher rates of maternal HIV transmission[23] which keeps the current prevalence of HIV in children a question in Pakistan.

This study is probably first study to determine the maternal transmission of HIV to children in Pakistan. However there is small sample size and study did not cover the risk factors associated with HIV. There is no difference noted between perinatal transmission of HIV or transmission via breastfeeding. Despite it limitation it raises the questions about awareness of HIV in high risk population groups, active screening of general population in Pakistan, current prevalence of HIV and a need for more active screening among pregnant patients as prevalence of maternal HIV transmission is high among countries with low prevalence of HIV[19].

CONCLUSION

Maternal HIV transmission to children is high in our population and there is need for active screening of all pregnant mothers.

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AUTHOR CONTRIBUTIONS

Tarar HS: Conception of idea, data collection
Afzal M: Literature review, data entry
Shah SMA: Data analysis, manuscript writing
Butt Z: Data analysis, manuscript writing
Shah SR: Critical review of manuscript
Hussain M: Critical review of manuscript

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