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Obstetric outcomes of HIV positive mothers in tertiary care hospital

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Abstract

Objective: To evaluate the pregnancy outcome of human immunodeficiency syndrome-positive mothers.

Method: The prospective observational study was conducted at the Department of Gynaecology and Obstetrics, Aziz Bhatti Shaheed Teaching Hospital, Gujrat, Pakistan, from June 2011 to March 2018, and comprised pregnant women screened positive for human immunodeficiency syndrome. Risk factors and perinatal outcomes were noted on a predesigned proforma. Data was analysed usingh SPSS 20.

Results: Of the 74 subjects with a mean age of 29±5.27 years, 63(85.1%) were multiparous and 11(14.9%) were nulliparous. Major risk factors included unsterilized nasal or ear piercing in 70(94.6%) subjects, history of blood transfusion 57(77%) and history of dental procedure in unsterilized settings 23(31.1%). Spouses of 43(58.1%) subjects were positive for human immunodeficiency syndrome, 22(29.7%) were negative and 9(12.2%) had

unknown status in this regard. In terms of outcome, 12(16.3%) subjects had spontaneous abortion, 11(12.2%) had intrauterine death of foetus, 6(8.1%) had preterm delivery and 45(60.8%) reached full term and were delivered. There were 2(2.6%) patients with stage 4 disease who died during pregnancy.

Conclusion: Human immunodeficiency syndrome infection in pregnant women was found to be associated with poor pregnancy outcome.

Key Words: HIV, Pregnancy, Pakistan, Perinatal, Risk factors.

Introduction

Human immunodeficiency virus (HIV) is a major health problem worldwide and estimated 36.7 million people were infected with it till the end of 2016. It is mainly present in developed countries and Africa, and has claimed almost 1 million lives due to acquired immunodeficiency syndrome (AIDS)-related problems.[1] The prevalence of HIV in Pakistan is relatively low. It is estimated that 0.13 million people are infected with HIV in Pakistan, and only 8,900 people are on anti-reteroviral therapy (ART). Out of 0.13 million, 40,000 women of child-bearing age (>15-49 years) are infected and a mere fraction of almost 5% (1900) are estimated to be taking ART [2]. It has the highest prevalence in injection drug users (IDUs) in Pakistan (21%)[2] and, according to a survey by World Bank in 2012, HIV was present in almost 50% IDUs in Gujrat district[3].

The risk factors for HIV transmission include blood transfusion, vertical exposure, sexual exposures, and other parenteral exposures in a descending order[4]. Pregnancies in HIV-positive mothers are associated with poor outcomes[5]. The effects of HIV on pregnancy include spontaneous abortion, stillbirth, preterm delivery and death of mother[6].

The World Health Organisation (WHO) guidelines[7] suggest the initiation of ART in all pregnant mothers regardless of their clinical stage and cluster of differentiation 4 (CD4) count, and should be continued lifelong. The current first-line

regimen for HIV treatment in adults, including pregnant females, include tenfovir disoproxil fumarate (TDF), lamuvidine (3TC) and efavirenz (EFV). Similarly, infant prophylaxis should be given to high-risk infants born to HIV-positive mothers as mother-to-child transmission is very high at 7 out of 10. It reduces long-term morbidity, and enhances infant immune response in infants. Current first-line drugs include ziduvidine (ZID; twice daily) and nevirapine (NVP; once daily) for the first 6 weeks.

There are no current studies available on perinatal outcome in mothers having HIV infection in Pakistan. As the estimated prevalence of HIV is low, few pregnant patients are encountered in daily practice who need a patient-centred approach for the wellbeing of mothers as well as infants born to HIV-positive mothers. Although there is low prevalence of HIV reported in women of child-bearing age, many cases go unreported due to social stigmata of being HIV-positive, and unawareness about the problems associated with it[2]. There is a need for research in HIV-positive pregnant females. The current study was plannedto meet that need by assessing the pregnancy outcome in HIV-positive mothers.

Subjects and methods

The observational cross-sectional study was conducted at the Department of Gynaecology and Obstetrics, Aziz Bhatti Shaheed Teaching Hospital, Gujrat, Pakistan, from June 2011 to March 2018.

After approval from the institutional ethics review committee, the sample size was calculated keeping frequency of stillbirth in pregnancy 3.3%[8] and using OpenEpi calculator while keeping 95% confidence interval (CI) and 5% margin of error.[9] After taking infoermed consent, all patients booked after pregnancy were screened for HIV using routine screening at their first visit. Patients who were already on ART or who were newly diagnosed during the screening itself were included using non-probability consecutive sampling.

All the women who were screened HIV-positive were counselled and the diagnosis was further confirmed by enzyme-linked immunosorbent assay (ELISA) for HIV. CD4 counts were checked and patients were classified into different stages using the WHO classification[10].

Those who were already on ART continued it, while the newly-diagnosed patients were started ART as per the WHO recommendations during pregnancy[10]. ART used was combination single daily dose of 3TC 150mg, ZID 300mg and NEV 200mg (Duovir-N). Those patients who presented and were diagnosed with HIV at the time of labour were started ART post-partum. No intrapartum ART was given due to unavailability of infusions form. Duration and time of initiation of ART was noted in all patients.

Detailed history was taken regarding risk factors of HIV. Risk factors included were spouse working abroad, history of working as sex worker, history of unsterilized nasal or ear piercing, history of IDU in patient and spouse, and history of blood transfusion in patients. Patients and their spouses were enquired about their HIV status. All patients were followed during pregnancy and outcomes of pregnancy were noted. Mode of delivery and place of delivery were noted in patients who reached full-term pregnancy. Gender of neonates delivered was also noted.

Foetal death >20 weeks of gestation was considered intrauterine death IUD). Patients were considered to have preterm delivery when they were delivered before reaching 37 weeks of pregnancy. Caesarean section (CS) was performed when there was either foetal or maternal distress or some mechanical obstruction to spontaneous vaginal delivery (SVD) or patients who did not receive ART during pregnancy and those mothers having viral load >1000 copies/ml or unknown at the time of delivery.

Patients were counselled regarding breastfeeding of neonates and contraceptive methods were advised. Neonates were started ART prophylaxis using NEV drops orally once daily and referred to HIV centre of the hospital for follow-up.

Patients were followed for 3 months postpartum and condition of patients and infants, mode of infant feeding, and use of contraceptives were enquired and noted. Data was collected on a predesigned proforma, and was analysed using SPSS 20. Continuous variables, like age and duration of ART, were expressed as mean ± standard deviation (SD). Categorical variables, such as risk factors and HIV status of spouse, were expressed as frequencies and percentages.

Results

Of the 74 married subjects with a mean age of 29±5.27 years, 63(85.1%) were multiparous and 11(14.9%) were nulliparous. Mean CD4 count was 573±234/mm^3 (Table 1).

Major risk factors included unsterilized nasal or ear piercing in 70(94.6%) subjects, history of blood transfusion 57(77%) and history of dental procedure in unsterilised settings 23(31.1%). Spouses of 43(58.1%) subjects were HIV-positive, 22(29.7%) were HIV-negative and 9(12.2%) had unknown HIV status (Table 2).

In terms of outcome, 12(16.3%) subjects had spontaneous abortion, 11(12.2%) had IUD of foetus, 6(8.1%) had preterm delivery and 45(60.8%) reached full term and were delivered (Table 3). There were 2(2.6%) patients with stage 4 disease who died during pregnancy.

ART was started during pregnancy in 64(86.5%) patients. Of them, 9(12.2%) were already diagnosed but not on ART, while 55(74.3%) were newly diagnosed. Also, 2(2.7%) patients who were already diagnosed and taking ART, while 8(10.8%) presented at the time of labour and were started ART postpartum. Mean duration of ART in patients who presented during pregnancy was 134.74±82.76 days while those who were already on treatment had mean duration of treatment of 318.5±9.19 days. According to WHO classification, 5(6.7%) patients had stage 1, 58(78.4%) stage 2, 7(9.5%) stage 3 and 4(5.4%) patients had stage 4 disease.

Those reaching full term were delivered in hospital. Of them, 30(58.8%) had CS and 21(41.2%) SVDs. Overall, 50(98%) patients had singleton pregnancy and 1(2%) had twin pregnancy. Besides, there were 24(46.2%) boys and 28(53.8%) girls.

In patients who delivered, 44(86%) were stable, 5(9.8%) were lost to follow-up and 2(3.92%) died during the follow-up period. The overall mortality, as such, was 4(5.4%).

While all the remaining 44(100%) patients who came for follow-up were adherent to the use of condom as a contraceptive, feeding option of top feed was adopted by only 20(45.45%) patients and 24(54.55%) adopted breastfeeding despite the counselling.

Discussion

Although the reported prevalence rate of HIV infection in Pakistan is 0.1 in adults and <0.1 in women of child-bearing age[3], there might be a large number of undiagnosed HIV infection which is the case even in the developed countries[11] like the United States. Social dilemma associated with diagnosis of HIV further increases the woes of patients, and leads to under-reporting and complications associated with HIV. As depicted in the current study, a few patients despite diagnosis were not taking ART. Although rare among females of child-bearing age, the current study demonstrates the problems which can present in such women in our country where research data is scarce regarding this issue.

Although screening is necessary in all females at booking visit[10], there is lack of awareness regarding booking and its benefits in our country. Early booking can lead to early diagnosis and treatment of HIV. Diagnosis of HIV before pregnancy and initiation of ART potentially leads to better outcome of pregnancy[12]. Antenatal ART also reduces the transmission of HIV to infants[13].

Multiple risk factors are associated with transmission of HIV. There are no studies done in the country addressing the risk factors of HIV transmission among women of child-bearing age. Nasal and ear piercing is a common practice which is done mainly in unsterilized settings. The same needles are usually used which pose a major risk factor for HIV transmission as shown in the current study. Dental procedures from quacks are also a potential threat towards the spread of HIV. Blood transfusion is considered a major risk factor for HIV transmission[4].

This None of the patients in the current study had a history of IV drug abuse or working as sex worker. WHO data shows that prevalence among sex workers and IV drug abusers is 3.8% and 21% respectively[3]. A small number of spouses of these patients had history of IV drug abuse and were living abroad where they might have been exposed to unprotected sex.

One of major risk factors identified by the current study was prevalence of HIV in spouse (58.1%). There was no information available regarding transmission husband-to-wife or wife-to-husband. There is lack of knowledge about HIV in Pakistani mothers. A study showed that more than half the mothers had absolutely no idea of HIV[14]. Lack of knowledge of HIV in women and sero-positivity of spouse also pose a major risk of transmission, although rate of sexual transmission of HIV is very low[4]. A study in Faisalabad regarding risk factors of HIV in sero-positive patients showed IV drug abuse as the major risk factor followed by blood transfusion and sexual transmission[15].

The current study showed only 60.8% pregnancies in HIV-positive mothers reaching full term and maternal mortality of 5.4%. A meta-analysis showed increased incidence of stillbirths and pre-term delivery in patients infected with HIV[16] which is also evident in the current study. A recent study in a large sample of HIV-positive women in India reported pregnancy wastage in 17% mothers, including stillbirths (3.8%), spontaneous abortions (13.7%) and induced abortions (2.8%)[17]. These figures are comparable to the current study in

case of spontaneous abortions (13.7% vs 16.3%), but the rate of stillbirths was higher and none of patients had induced abortion. These differences may be due to a small sample size and inadequate ART in the current study. Another large study demonstrated stillbirths 3.3% (vs 12.2%) and preterm delivery in 19.6% (vs 16.3%).[8] This may also be due to different sample sizes.

The mortaility rates of the current study reported are comaprable with those reported earlier[18]. To thebest of our knowledge, the current study is a pioneering effort in the country. However it had a small sample size which ws collected over 7 years due to low prevalence rate of HIV in women of child-bearing age[3]. Tenofovir-based ART was used which has been reported safe in pregnancy and for neonates[19]. Data regarding mother-to-child transmission was not collected, but infant prophylaxis was advised. It also showed poor adherence to counselling regarding breastfeeding.

The outcome of pregnancy in HIV-positive women can be improved by decreasing the social stigmata associated with HIV, improving knowledge about HIV and benefits of ART. Integrating maternal health with HIV services may reduce the adverse maternal and neonatal outcomes[20]. Further large-scale studies are needed in this regard.

Conclusion

HIV infection in pregnant women was found ot be associated with poor pregnancy outcome.

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References

1. WHO HIV/AIDS Factsheet 2017. Available at http://www.who.int/mediacentre/factsheets/fs360/en/ last accessed on 25 March 2018.
2. WHO Country Factsheet Pakistan 2016 available at http://www.unaids.org/en/regionscountries/countries/pakistan last accessed on 25 March 2018.
3. HIV/AIDS in Pakistan. Available at http://www.worldbank.org/en/news/feature/2012/07/10/hiv-aids-pakistan last accessed on 25 March 2018.
4. Patel P, Borkowf CB, Brooks JT Lasry A, Lansky A, Mermin J. Estimating per-act HIV transmission risk: a systematic review. AIDS. 2014;28:1509–1519. DOI: 10.1097/QAD.0000000000000298.
5. Arab K, Spence AR, Czuzoj-Shulman N, Abenhaim HA. Pregnancy outcomes in HIV-positive women: a retrospective cohort study. Arch Gynecol Obstet 2017;295(3):599–606 DOI: 10.1007/s00404-016-4271-y
6. Gautam S, Shah T. Study of perinatal outcome in human immunodeficiency virus positive women. Int J Reprod Contracept Obstet Gynecol. 2016;5(8):2587-2591 DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20162627
7. WHO Consolidated Guidelines On The Use Of Antiretroviral Drugs For Treating And Preventing HIV Infection 2016 Recommendations For A Public Health Approach. Second Edition. Available at http://apps.who.int/iris/bitstream/handle/10665/208825/9789241549684_eng.pdf;jsessionid=375920B0EB562009B1A689DC36B22C12?sequence=1 last accessed on 25 March 2018.
8. Chen JY, Ribaudo HJ, Souda S, Parekh N, Ogwu A, Lockman S. et al. Highly active antiretroviral therapy and adverse birth outcomes among

HIV-infected women in Botswana. *J Infect Dis*. 2012;206(11):1695–1705. doi:10.1093/infdis/jis553

9. OpenEpi Sample Size Calculator available at: http://www.openepi.com/SampleSize/SSCC.htm last accessed on 23rd April 2020
10. WHO Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. available at https://www.who.int/hiv/pub/guidelines/arv2013/download/en/ last accessed on 09 August 2019
11. Hall HI, An Q, Tang T, Song R, Chen M, Green T, et al. Prevalence of Diagnosed and Undiagnosed HIV Infection--United States, 2008-2012. Morb Mortal Wkly Rep. 2015;64(24):657-62.
12. Momplaisir FM, Brady KA, Fekete T, Thompson DR, Diez Roux A, Yehia BR. Time of HIV Diagnosis and Engagement in Prenatal Care Impact Virologic Outcomes of Pregnant Women with HIV. PLoS ONE. 2015;10(7): e0132262. doi:10.1371/journal.pone.0132262
13. Fowler MG, Qin M, Fiscus SA, Currier JS, Flynn PM, Chipato T, et al. Benefits and risks of antiretroviral therapy for perinatal HIV prevention. N Engl J Med 2016;375:1726-37. DOI: 10.1056/NEJMoa1511691
14. S Zaheer, SK Aslam, K Shafique. Inequalities in HIV knowledge among Pakistani mothers: Results from Demographic Health Survey 2012-13 Eur. J. Public Health; 2016:(26),suppl1;ckw172.077, https://doi.org/10.1093/eurpub/ckw172.077
15. Maan MA, Hussain F, Jamil M. Prevalence and risk factors of HIV in Faisalabad, Pakistan—a retrospective study. Pakistan J Med Sci 2014;30:32–5. DOI: 10.12669/pjms.301.4176
16. Brocklehurst, P., French, R. The association between maternal HIV infection and perinatal outcome: a systematic review of the literature and

meta-analysis. Br J Obstet Gynaecol. 1998;105:836–848. DOI: 10.1111/j.1471-0528.1998.tb10227.x

17. Halli SS, Khan CGH, Shah I, Washington R, Isaac S, Moses S et al. Pregnancy wastage among HIV infected women in a high HIV prevalence district of India. BMC Public Health 2015; 15:602. DOI: 10.1186/s12889-015-1965-1

18. Ezechi OC, Gab-Okafor CV, Oladele DA, Kalejaye OO, Oke BA, Ujah IO. Pregnancy, obstetric and neonatal outcomes in HIV positive Nigerian women. Int J Gynecol Obstet. 2013;119:S345

19. Nachega JB, Uthman OA, Mofenson LM, Anderson JR, Kanters S, Renaud F et al. Safety of Tenofovir Disoproxil Fumarate–Based Antiretroviral Therapy Regimens in Pregnancy for HIV-Infected Women and Their Infants: A Systematic Review and Meta-Analysis. J Acquir Immune Defic Syndr. 2017;76(1):1-12. doi:10.1097/QAI.0000000000001359.

20. Hodgson I, Plummer ML, Konopka SN, Colvin CJ, Jonas E, Albertini J. et al. A Systematic Review of Individual and Contextual Factors Affecting ART Initiation, Adherence, and Retention for HIV-Infected Pregnant and Postpartum Women. PLoS ONE 2014;9(11): e111421. doi:10.1371/journal.pone.0111421

Table 1: Patient Characteristics

Patients' Characteristics	**Number**	**Percentage**
Number of Patients (n)	74	100%
Mean Age (years)	29±5.27	-
Parity • Multiparous • Nulliparous	 63 11	 85.1% 14.9%

HIV Status • Known • Unknown	 41 33	 55.41% 45.59%
Mean CD4 Count (mm^{-3})	573±234	-
Initiation of ART • Before Pregnancy • During Pregnancy • After Pregnancy	 2 64 8	 2.7% 86.5% 10.8%
Mean duration of ART (days)	134.74±82.76	-
WHO Disease Stage • Stage 1 • Stage 2 • Stage 3 • Stage 4	 5 58 7 4	 6.7% 78.4% 9.5% 5.4%

CD4: Cluster of differentiation 4; ART: Anti-reteroviral therapy; WHO: World Health Organisation.

Table 2: Frequency of Risk factors of HIV in sample population

Risk Factor	Number	Percentage
Unsterilized nasal or ear piercing	70	94.6%
Blood transfusion	57	77%
Dental procedure in unsterilized settings	23	31.1%
Spouse using IV drugs	8	10.8%
Spouses working abroad.	6	8.1%
HIV Status of Spouse • HIV positive • HIV negative	 43	 58.1%

• Unknown HIV status	22 9	29.7% 12.2%
History of IV drug abuse	0	0%
Worked as sex-worker	0	0%

HIV: Human immunodeficiency syndrome; IV: Intravenous

Table 3: Maternal Outcomes in Human immunodeficiency syndrome **(HIV) Positive Mothers.**

Pregnancy Outcome	**Number**	**Percentage**
Spontaneous abortion	12	16.3%
Intrauterine death (IUD)	11	12.2%
Preterm delivery	6	8.1%
Full term delivery	45	60.8%