

Evolving characteristics of HIV infected pregnancies at a single institution

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ABSTRACT

Objective: Over the past 26 years, significant advances have been made in the understanding and management of patients infected with HIV. We sought to determine if these changes in HIV care have had an impact on the characteristics of pregnant women with HIV and their pregnancies in a large cohort of HIV infected women at a single institution.

Study Design: This was a retrospective review of all pregnancies infected with HIV who presented for prenatal care at our institution from January 1986 through November 2012. Medical records were reviewed and maternal, neonatal, and delivery data were ascertained. The data were divided into three cohorts representing different levels of antiretroviral therapy and analyzed for trends. Cohort 1 (pre-HIV interventions) includes data from 1986-1991, Cohort 2 (introduction of ZDV) includes data from 1992-2002, and Cohort 3 (multi-drug therapy) comprises the remaining data from 2003-2012.

Results: During the 26 year study period 1005 HIV infected pregnancies were identified. The incidence of HIV in pregnancy has remained stable at 0.2 –0.3% of all deliveries. The vast majority of our HIV infected obstetric population receives prenatal care and the number of patients receiving no prenatal care has decreased over time (27% to 6%, p<0.001). There has been a significant increase in maternal age and number of prenatal visits during the study period. The estimated gestational age at delivery has remained steady throughout the entire data set and there have been no changes in birthweight, 5-minute APGAR <7, prematurity, stillbirth, or neonatal deaths. The rate of cesarean section doubled (24% to 55%, p<0.001) for deliveries after 2000 following the release of guidelines recommending scheduled c-section for patients with viral loads >1000 copies/mL. Median maternal viral load and CD4 count have not changed significantly throughout the cohorts, with HIV viral load usually becoming non-detectable by delivery.

Conclusion: Over the past two decades, HIV infected women have presented for prenatal care at an older age, entered prenatal care earlier with more frequent visits and overall have decreased maternal viral copy number at delivery with antiretroviral therapy. Despite increased maternal age, pregnancy outcomes remain excellent. This study highlights the fact that appropriate prenatal care is associated with excellent pregnancy outcome in this high risk population.

BACKGROUND

Over the past two decades, there have been major changes in the understanding and management of HIV. The understanding of HIV in pregnancy has also improved, allowing for advances in the management of HIV infected pregnancies and the counseling of HIV infected women of childbearing age. According to the CDC, from 1996 to 1999, there was a 31% increase in the number of women in the United States living with AIDS, reflecting improved survival with implementation of new combination treatment regimens. It is estimated that 160,000 women in the United States are infected with HIV, 80% of which are of childbearing age. Mother-to-child transmission can occur during pregnancy, delivery, or breastfeeding. Before the use of chemoprophylaxis and other interventions, perinatal transmission rates were 25-30%. The current HIV transmission rate has been reduced to <2%, and is attributed to routine HIV screening of pregnant women, use of antiretroviral drugs for treatment and prophylaxis, avoidance of breastfeeding, and use of elective cesarean delivery when appropriate.

HIV treatment regimens have also changed considerably in the past 20 years. In 1994, the U.S. Public Health Service Task Force (USPHSTF) and CDC issued consensus recommendations for the administration of ZDV (Zidovudine) to the mother during pregnancy, intravenous ZDV during labor, and ZDV to the infant for 6 weeks to reduce perinatal HIV transmission. Current recommendations for care of HIV infected women during pregnancy include multi-drug antiretroviral therapy for treatment of the woman as well as prophylaxis to decrease the risk of perinatal transmission, administration of intrapartum ZDV, and cesarean delivery at 38 weeks for HIV infected women with viral loads greater than 1000 copies/mL. Additionally, routine HIV screening is recommended at the first prenatal visit for all pregnant women, and rapid testing is recommended for women in labor with unknown HIV status.

As the understanding and management of HIV in pregnancy has rapidly evolved, pregnancy outcomes, infant outcomes, and the obstetrical patients themselves have changed. Our institution has been the major provider of obstetrical care to the HIV population of Dallas for almost three decades. Considering the rapidity of change that has occurred over the past 20+ years, it is important to examine the changing characteristics of these patients and document experiences in treating these pregnancies.

MATERIALS AND METHODS

This is a retrospective review of all pregnant women with HIV cared for at Parkland Health and Hospital System. All pregnancies with a confirmed HIV test from January 1986 through November 2012 were identified.

Medical records were reviewed for maternal demographics, gestational age at presentation, adequacy of prenatal care, HIV risk factors, timing of HIV diagnosis, HIV viral loads, CD4 counts, prenatal laboratory data, maternal co-infection, HIV resistance patterns, antiretroviral therapy, maternal compliance with therapy, HIV viral load prior to delivery, and mode of delivery.

Pregnancy outcomes, including gestational age at delivery, birthweight, uterine infection, wound infection, fetal outcomes, and stillbirth were also determined through the use of an obstetrical database maintained by the Department of Obstetrics and Gynecology.

OBJECTIVE

The purpose of this study is to document the changing variables of HIV infected pregnancies and to determine changes in these variables and pregnancy outcomes over time at a single institution.

RESULTS

- 1005 HIV infected women delivered during the study time frame.

- Demographic characteristics are detailed in Table 1. Patients presenting prior to 1992 were more likely to be nulliparous and younger.

- The number of years that the patient had been HIV positive increased with each successive cohort. Women presenting in earlier cohorts were significantly more likely to be diagnosed as HIV positive during pregnancy. After 1992, more HIV infected women presented with AIDS (CD4 count <200 cells/mm³) (Table 2).

- There was no significant difference in estimated gestational age at delivery, incidence of preterm birth, or birthweight between the groups (Table 3).

- In May 2000, new guidelines recommended scheduled cesarean delivery for HIV infected women with HIV viral levels >1000 copies/mL near the time of delivery. The rate of cesarean section more than doubled following this guideline change. (Table 4 & 5).

- From 1986-1991, patients were significantly more likely to not receive prenatal care (27%). Patients who presented for prenatal care presented at later gestational ages (mean EGA 25 weeks) and had fewer prenatal visits compared to patients in later cohorts (Table 5).

- HIV viral loads decreased to <1000 copies/mL in more than 90% of patients who were given antiretroviral medications and were compliant with their prescription for longer than 4 weeks.

- Viral loads at delivery decreased to <1000 copies/mL in the majority of women initially presenting with viral loads >1000 copies/mL who had more than one prenatal visit. An additional 9-16% of these women had non-detectable HIV viral loads by the time of delivery.

RESULTS

Table 1. Demographic Information

	1986-1991 N=74	1992-2002 N=436	2003-2012 N=495	P-value
Age (x± SD)	24 ± 5.2	26 ±6.9	28 ± 5.9	< 0.01*
≤18 yoa	17 (23)	50 (11.5)	17 (3.4)	<0.001**
≥35 yoa	4 (5.4)	38 (8.7)	77 (15.6)	0.001**
Race				<0.01
Black	39 (53)	306 (70)	322 (65)	
White	20 (27)	54 (12.4)	62 (12.5)	
Hispanic	14 (19)	75 (17)	107 (22)	
Other	1 (1.4)	1 (0.2)	2 (0.4)	
Nulliparity	45(61)	130 (30)	147 (30)	<0.001*

Data presented as N(%) or mean ± standard deviation

* 1986-1991 differ from other 2 epoch

** All 3 groups differ from each other

Table 2. HIV Status

	1986-1991 N=74	1992-2002 N=436	2003-2012 N=495	p-value
HIV Diagnosis during pregnancy	58/69 (84)	210/378 (56)	128/343 (37)	<0.001 **
# Years HIV Positive (mean ± SD)	0 ± 0.9	1 ± 2.2	3 ± 3.3	<0.001 **
Presenting Viral Load (copies/ml)	N/A	1860 (0, 14588)	1760 (0,16700)	NS
Presenting Viral Load Non-detectable	N/A	80/240 (33)	126/477 (26)	0.05
Presenting CD4 Count (cells/ mm ³)	538 (324, 796)	459 (331, 634)	464 (312, 622)	NS
Presenting CD4 <200 (cells/mm ³)	0/26 (0)	28/279 (10)	57/483 (11)	NS
Delivery Viral Load	N/A	0 (0, 1060)	0 (0,583)	NS
Delivery Viral Load <1000 copies/mL	N/A	206/277 (74)	373/472 (79)	NS
Delivery Viral Load Non-detectable	N/A	179/277 (65)	301/472 (64)	NS
Delivery CD4 (cells/mm ³)	574 (414, 784)	508 (347, 685)	532 (345, 674)	NS
Delivery CD4 <200 (cells/mm ³)	2/36 (6)	33/370 (9)	38/470 (8)	NS

Data presented as median [Q₁, Q₃] or N/Total (%) unless otherwise stated

**All 3 groups differ from each other

Table 3. Delivery Information

	1986-1991 N=74	1992-2002 N=436	2003-2012 N=495	P-value
EGA at delivery	38.1 ± 2.9	37.9 ± 4.3	37.8 ± 2.6	NS
<37 wks	10 (14)	67 (15)	59 (12)	NS
<32 wks	4 (5)	13 (3)	14 (3)	NS
Mode of delivery				<0.001
Vaginal	60/72 (83)	283/428 (66)	204/480 (43)	
Cesarean	12/72 (17)	137/428 (32)	274/480 (57)	
Forceps	0/72 (0)	7/428 (1.6)	2/480 (0.4)	
Chorioamnionitis	4/71 (6)	34/416 (8)	20/473 (4)	0.05
Birthweight (gms)	2921 ± 712	2997 ±696	2986 ± 615	NS
Infant HIV Infected	9 (12)	23 (5)	8 (2)	<0.001

Data expressed as N (%) or mean ± standard deviation

Table 4. Cesarean rate

1986-2000 N=392	2001-2012 N=603	P-value
94 (24)	329 (55)	<0.001

Table 5. Antepartum Care

	1986-1991 N=74	1992-2002 N=436	2003-2012 N=495	p-value
No prenatal care	18/68 (27)	10/179 (6)	12/218 (6)	<0.001*
EGA 1 st visit	25 (19,32)	15 (8,23)	12 (8,21)	<0.01*
# PNV	4(1,8)	9(6,12)	11(6,14)	<0.001*

Data presented as N (%) or (median [Q₁, Q₃])

*1986-1991 differ from other 2 epoch

Table 6. HIV Viral load at delivery in women with initial Viral Load >1000 copies/mL with >1 prenatal visit

	1992-2002 N=136	2003-2012 N=265
HIV viral load ND	76 (56)	137 (52)
HIV viral load <1000 copies/ml	89 (65)	180 (68)

Data presented as N (%)

CONCLUSIONS

Over time, our HIV infected pregnant population has become older, more parous, with longer duration of HIV diagnosis, and presented earlier and more frequently for prenatal care.

With multi-drug therapy, frequent prenatal care, and patient compliance, maternal viral loads frequently decrease to <1000 copies/mL at delivery.

Despite increasing maternal age and more advanced HIV disease pregnancy outcomes remain excellent, highlighting the importance of prenatal care and multi-drug therapy in the care of this high risk population.

