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BS Meena
Professor and Head of Department, Department of Obstetrics and Gynecology, S.M.S. Medical College, Jaipur, Rajasthan, India

Swati Trivedi
Junior Resident, Department of Obstetrics and Gynecology, S.M.S. Medical College, Jaipur, Rajasthan, India

Oby Nagar
Professor and Unit Head, Department of Obstetrics and Gynecology, S.M.S. Medical College, Jaipur, Rajasthan, India

Prasoon Rastogi
Senior Resident, Department of Obstetrics and Gynecology, S.M.S. Medical College, Jaipur, Rajasthan, India

Nimisha Gupta
Junior Resident, Department of Obstetrics and Gynecology, S.M.S. Medical College, Jaipur, Rajasthan, India

Corresponding Author:
Swati Trivedi
Junior Resident, Department of Obstetrics and Gynecology, S.M.S. Medical College, Jaipur, Rajasthan, India

Prospective comparative study of the effect of HIV infection on pregnancy outcomes between HIV seropositive and seronegative groups

BS Meena, Swati Trivedi, Oby Nagar, Prasoon Rastogi and Nimisha Gupta

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Abstract
Background and objectives: To compare the age, booking status of HIV seropositive with seronegative pregnant females. To study the effect of HIV on term of delivery, birth weight of baby and mode of delivery opted by patients.
Methods: Prospective comparative study on 40 HIV seropositive and 40 HIV seronegative pregnant women attending ANC and delivering in the Department of Obstetrics and Gynaecology, S.M.S. Medical College, Jaipur, Rajasthan.
Result: HIV seropositive patients mostly were booked, with maximum belonging to lower socio-economic status. No statistically significant differences were found in the outcomes of HIV seropositive patients in terms of new born birth weight or gestational age at delivery in comparison to seronegative pregnant patients.
Conclusion: Due to better access to health care facilities now a days, more number of HIV seropositive patients are getting themselves booked. HIV has no effect on birth weight or term of delivery of baby.

Keywords: HIV, mode of delivery, term of delivery, birth weight

Introduction
The human immunodeficiency virus (HIV) is a lentivirus (a subgroup of retrovirus) that causes HIV infection. It later manifests as acquired immunodeficiency syndrome (AIDS) in which progressive failure of immune system occurs.
HIV is a parenterally transmitted infection and occurs by contact with or transfer of blood, pre-ejaculate, semen and vaginal fluids. Non sexual transmission can occur from an infected mother to her infant through breast milk or during pregnancy or child birth due to exposure to her blood or vaginal fluid. Without treatment, the risk of mother to child transmission is 15-45%, while treatment reduces the risk of transmission to below 1% [1].
Out of 29 million pregnancies every year, an estimated 22,000 occur in HIV infected women. All these HIV infected pregnant women have to be detected and provided with timely ART in order to reduce mother to child transmission and ultimately to eliminate pediatric HIV [2]. After delivery, children are given prophylaxis also to reduce the risk of infection through breast milk.

Materials and Methods
Study design: Prospective - Comparative study
Study population: HIV seropositive and HIV seronegative pregnant women attending ANC and delivering in our hospital, S.M.S. Medical College, Jaipur, Rajasthan.
Sample size: 40 women in each HIV seropositive and seronegative group.
Study was conducted after written informed consent and application of Inclusion and Exclusion criteria.
Patient data in the form of history, examination, investigation reports etc were gathered and charted on a pre-set proforma. Data analysis was done with t- test and chi square test.

Results

Table 1: Age distribution of study groups

Age group (years)	Case		Control		Total	
	N	%	N	%	N	%
< 25	16	40	22	55	38	47.5
25 – 30	17	42.5	16	40	33	41.25
>30	7	17.5	2	5	9	11.25
Total	40	100	40	100	80	100

Chi-square = 3.755 with 2 degrees of freedom; P = 0.153 (NS)

As in table 1, most of the subjects in sero-positive (case) group were in age group 25 to 30 years (42.5%) while most of the subjects in control group sero-negative were in the age group <25 years (55%). The differences in age distribution was not found to be statistically significant. (p = 0.153).

Table 2: Distribution of study groups according to booking status

Booking status	Case		Control		Total	
	N	%	N	%	N	%
Booked	26	65	28	70	54	67.5
Un-booked	14	35	12	30	26	32.5
Total	40	100	40	100	80	100

Chi-square = 0.057 with 1 degree of freedom; P = 0.811 (NS)

Table 2 shows that among the seropositive group i.e. cases, 65% patients were booked and 14 patients i.e. 35% were unbooked. While in the control group i.e. seronegative, 28 patients (70%) were booked and 12 patients (30%) were unbooked. The difference was not found to be statistically significant (p = 0.811)

Table 3: Distribution of study groups according to their Socio economic status

SES	Case		Control		Total	
	N	%	N	%	N	%
Low	25	62.5	17	42.5	42	52.5
Middle	15	37.5	23	57.5	38	47.5
Upper	0	0	0	0	0	0
Total	40	100	40	100	80	100

Chi-square = 2.456 with 1 degree of freedom; P = 0.117 (NS)

Present table 3 shows that most of the subjects in seropositive group belonged to low socio-economic status i.e. 62.5% followed by 15 patients (37.5%) in middle socio-economic group and none in upper socio-economic group. While in the control group, more no. of patients (23) were found belonging to middle socio-economic status group 57.5% and 42.5% were in low socio-economic status group with none in upper socio-economic status group. No significant difference was seen in the patients according to the socio-economic status (p = 0.117)

Table 4: Mode of delivery among study groups

Mode of delivery	Case		Control		Total	
	N	%	N	%	N	%
Caesarean	13	32.5	12	30	25	31.25
Vaginal	27	67.5	28	70	35	43.75
Total	40	100	40	100	80	100

Chi-square = 0.000 with 1 degree of freedom; P = 1.000 (NS)

In table 4, amongst seropositive cases, 13 patients (32.5%) underwent caesarean section while 27 patients (67.5%) had vaginal delivery. While in the control group i.e. seronegative group, 12 patients (30%) had caesarean section and 28 patients (70%) were delivered vaginally. The result was not found to be statistically significant. (p = 1.000)

Table 5: Term of delivery among study groups

Term of delivery	Case		Control		Total	
	N	%	N	%	N	%
Term	36	90	39	97.5	75	93.75
Preterm	4	10	1	2.5	5	6.25
Total	40	100	40	100	80	100

Fisher Exact Test - P = 0.359 (NS)

As per table 5, among the seropositive group, 4 patients (10%) had preterm delivery i.e. < 37 weeks while in the control group, 1 patient (2.5%) had preterm delivery. The results are not statistically significant. (p = 0.359)

Table 6: New born Birth weight among study groups

Birth weight (Kg)	Case		Control		Total	
	N	%	N	%	N	%
<2.5 Kg	8	20	9	22.5	17	21.25
≥ 2.5 Kg	32	80	31	77.5	63	78.75
Total	40	100	40	100	80	100
Mean ± SD	2.73 ± 0.09 Kg		2.81 ± 0.47 Kg			

Chi-square = 0.000 with 1 degree of freedom; P = 1.000 (NS)
t = -0.699 with 78 degrees of freedom; P = 0.486 (NS)

As shown in table 6, in the seropositive mother group/cases, 8 babies (20%) born of 40 had weight < 2.5 kg i.e LBW (low birth weight) while in the seronegative mother group/control, 9 babies (22.7%) born of 40 were LBW. The differences were not found to be statistically significant. (p = 0.486)

Discussion

The mean age of HIV+ve patients in our study was 26.16 years. Mean age in study done by Dwivedi *et al.* [3] was found to be 25.2 years; while in study done by Prameela *et al.* [4], the mean age were 23 years. The mean age of HIV-ve patients in our study was 24.5 years.

Comparative number of patients, both HIV+ve and HIV-ve, were booked 65% and 70% respectively. This could be attributed to easy accessibility to ART centres under NACO's initiative.

62.5% subjects in seropositive group belonged to low socio-economic status with 37.5% belonged to middle socio-economic status and none in upper socio-economic status group. According to Yadav *et al.* [5], the low socioeconomic status and lack of education were main reason for the lack of awareness of the infection and also for loss of follow up.

In our study, 32.5% patients delivered by Caesarean section while the rest 67.5% (who refused or came in active labour) delivered vaginally; as caesarean was offered to all the patients. In study done by Dwivedi *et al.* [3] and Yadav S. *et al.* [5], most of the women delivered vaginally (65%), as LSCS in HIV seropositive patients was done for obstetric indication only. The rate of transmission was marginally less than normal labour. In study done by E.Azria *et al.* [6] 55% women delivered by Caesarean section.

Among seropositive group, 10% patients delivered preterm while 2.5% in seronegative group were delivered preterm. The mean birth weight in HIV seropositive group was 2.73 kg and that in HIV seronegative was 2.81 kg. In HIV seropositive group 20% babies were LBW (birth weight <2.5 kg) while in HIV seronegative group 22.7% were LBW. There no statistically significant difference found in either of the inferences. Schulte *et al.* [7] in his study reported a decline in the rates of low-birth-weight infants and preterm infants. On the contrary, Dadhwal *et al.* [8] in his study concluded that the mean birth weight was

lower in new born of HIV infected women. Brocklehurst *et al*. [9] and Peng Lei Xiao [10] also reported in their study an association between LBW & PTD with maternal HIV infection.

Conclusion

Our study concludes that most women in HIV seropositive group were in the age group 25 to 30 years with maximum patients booked. Though most belonged to the low socio-economic status, but because of better availability of health services by NACO and ART centres, no statistically significant difference was found on birth weight of term of delivery of the baby.

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