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# Distribution of HIV among pregnant women visiting a tertiary care hospital in Kathmandu, Nepal

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### ABSTRACT

**Objective:** To explore the distribution of HIV among the pregnant women visiting a tertiary care hospital in Kathmandu.

**Methods:** A total of 1440 blood samples from pregnant women were collected and tested for anti-HIV antibodies using rapid screening assay kits and ELISA in Paropakar Maternity and Women's Hospital during May to November, 2011.

**Results:** The overall sero-prevalence of HIV among pregnant women was 0.62%, the prevalence being highest (1.4%) in age group 35–39 years old, and during second trimester of gestation (0.75%). Similarly, it was found to be highest among the illiterates (1.92%), commercial sex worker (10.00%) and those having multiple sexual partners (30.00%).

**Conclusions:** Sero-prevalence of HIV infection was higher among the pregnant women of Kathmandu.

## 1. Introduction

Human immuno deficiency virus (HIV) has emerged as global epidemic disease since its emergence in 1981 and is spreading steadily throughout the world, mostly affecting the developing and under developed countries[1]. Ever since its discovery, acquired immune deficiency syndrome (AIDS) has killed more than 25 million people, making it one of the most destructive pandemics in recorded history[2]. Nepal reported its first AIDS case in 1988[3]. Since then, HIV has evolved in Nepal from a low prevalence to a concentrated epidemic, mostly affecting commercial sex workers, injecting drug users, men who have sex with men, children and labour migrants to India[4]. Four major transmission routes for HIV have been identified; sexual route, parenteral route, mother to child transmission and blood or blood products.

The global HIV prevalence rate among women of

reproductive age is reported to be 0.6% while among the pregnant women in low and middle income countries, it is reported to be 2.3%[2]. Infection among pregnant women poses a particular risk to their families, offspring and health workers at the time of delivery[5], and is associated with adverse maternal and foetal outcomes[6]. The effects of this include morbidity, vertical transmission and severe anaemia[7,8]. About 90% of the HIV-infected children acquire the infection from their mothers during pregnancy and childbirth[9,10]. Therefore, screening of pregnant women at an early stage of pregnancy may help in prompt counselling and therapy, thereby reducing the risk of transmission to the child.

The role of HIV/AIDS in maternal mortality in Nepal is difficult to evaluate as the HIV status of pregnant women in this region is largely unknown[7]. Estimation of the sero-prevalence of HIV in pregnant women provides essential information for an effective implementation of HIV/AIDS control programmes and also for the monitoring of HIV spread within a country especially from mother to child. To the best of our knowledge, only a few studies on HIV prevalence in antenatal women are available from Nepal, and in fact none indicates the current trend

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in seroprevalence from this area. Hence, we sought to determine the rate and distribution of HIV among pregnant women visiting a tertiary care hospital in Kathmandu.

## 2. Materials and methods

This study was conducted among pregnant women of age group 15–40 years old attending the antenatal clinic in Paropakar Maternity and Women's Hospital (PMWH), Thapathali Kathmandu during May to November, 2011. With the help of 5 mL disposable sterile syringe (Lifeline, Nepal), 5 mL blood was drawn and disposed in a test tube labeled with sample number. All the collected blood samples were first incubated at 37 °C for 15–30 min and then centrifuged at 2000 r/min for 4 min. Serum thus separated from the blood samples were tested for the presence of anti HIV–1 and 2 antibodies using WHO testing strategy II (two different rapid screening assays *i.e.* determine test kit followed by uni-gold rapid test kit and SD Biotest test kit) following all the standard operating protocols (Figure 1). All the collected positive samples were evaluated by advanced HIV diagnostic kit for antibody to HIV (Sandwich ELISA test kits) following standard manufacturer's protocol (BEP III).

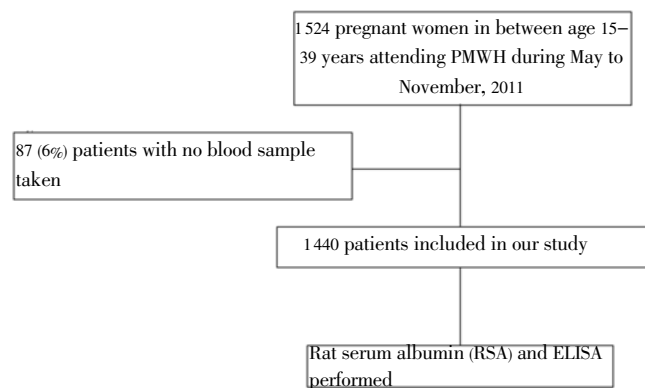


Figure 1. Flow diagram of sampling of the patients.

### 2.1. Statistical analysis

Data was analyzed using SPSS Version 17.0. *Chi*–square was done and the value of significance for all statistical tests was  $P < 0.05$ .

## 3. Results

During May to November 2011, there were 1524 pregnant women in between 15–39 years old seeking for cure in PMWH. Of these, blood sample could not be taken from 87 (6%) patients. A total of 1440 samples from pregnant women were screened for the presence of anti HIV antibodies (Figure 1). Among them, 624 were aged between 20–25 years of age, 536 were in the second trimester of gestation and 946 were housewives. The overall HIV positive cases were 9 (0.62%) in both rapid screening assay and ELISA tests.

Age wise distribution of HIV positives showed the highest sero–prevalence of HIV in 35–39 years old aged pregnant women which accounts for 1.4% while the lowest sero–prevalence was observed in pregnant women aged 25–29 years. The highest number of HIV cases in association to

pregnancy was found in second trimester (0.75%) followed by third trimester. The association of HIV with sexual relation revealed that 6 (30.00%) women with multiple sexual partners had HIV infection shown in Table 1.

Table 1

Demography and sexual behavior of HIV cases.

Characters	No. of patients	RSA and ELISA reactive No. (%)	<i>P</i> value	
Age	15–19	256	2 (0.78)	0.570
	20–24	624	3 (0.48)	
	25–29	343	1 (0.29)	
	30–34	146	2 (1.30)	
	35–39	71	1 (1.40)	
Pregnancy	First trimester	406	2 (0.49)	0.860
	Second trimester	536	4 (0.75)	
	Third trimester	498	3 (0.60)	
Sexual relation	Single partner	1420	3 (0.21)	0.001*
	Multi partner	20	6 (30.00)	
Total	1440	9 (0.62)		

\*:  $P < 0.05$ .

Education wise distribution of HIV cases revealed that the highest number of cases (6) were among the illiterates followed by primary and lower secondary level. Association of HIV with occupation showed that the highest sero–prevalence of HIV was seen among commercial sex workers (CSW) which was 10.00% followed by the housewives which accounted for 0.74% (Table 2).

Table 2

Educational and occupational distribution of HIV cases.

Characters	No. of patients	RSA and ELISA Reactive No. (%)	<i>P</i> value	
Education	Illiterate	311	6 (1.92)	0.044*
	Primary	235	2 (0.85)	
	Lower secondary	269	1 (0.37)	
	Secondary	322	–	
	Higher secondary	207	–	
	Graduate	84	–	
	Postgraduate	12	–	
Occupation	Housewife	946	7 (0.74)	0.001*
	Agriculture	204	–	
	Nursing	8	–	
	Banking	25	–	
	Hotel/restaurant	25	–	
	Business/industry	73	–	
	Student	17	–	
	Service	31	–	
	CSW	20	2 (10.00)	
	Teaching	30	–	
	Labour	45	–	
Others	16	–		
Total	1440	9 (0.62)		

\*:  $P < 0.05$ . CSW: Commercial sex worker.

## 4. Discussion

Nepal's socio–economic status, traditional and social ills, cultural myths on sexuality and a huge population

of marginalized people, geographic proximity to India which is inhabited by millions of HIV positive people make it extremely vulnerable to HIV/AIDS. The findings of this study have a great significance because it provides clear insight of an increasing trend of sero-prevalence at a rate of 0.62% among pregnant women. It is similar to the findings reported in some studies<sup>[2]</sup>, whereas it is relatively higher than in a previous study which reported the overall sero-prevalence of 0.49% among the pregnant women<sup>[11]</sup>. Such differences in sero-prevalence might be due to geographical variation, actual epidemic situation, sensitivity and specificity of test kits as well as diagnostic algorithms used in each study.

In this study, the highest prevalence of HIV was among the 35–39 years age group, followed by 15–19 years. Majority of the cases had second trimester of gestation especially in the housewives while the pregnant women who had worked as CSW had a prevalence rate of 10%. This is probably because housewives in comparison to other women, who are engaged in job, are less educated and hence less aware about HIV and more engaged in unhygienic sexual activity with their partner which is the leading risk factor for HIV infection. Apart from this, most of those infected housewives acquired infection from their husband. Similarly, CSW have multiple sexual partners which increases the exposure rate, thus being a major risk factor for HIV infection. In our study, majority of the cases were found to have multiple sexual partners. Men or women with a high number of lifetime partners are at greater risk of HIV infection probably due to increased sexual activity which makes them prone to vaginal or penile mucosal lacerations<sup>[12]</sup>. Education-wise distribution of the cases revealed an inversely proportional relation between education and HIV prevalence, the highest prevalence being among the illiterates. This could be the result of positive influence of education which makes public enlightened and aware about their health and health related habits.

The limitations of the study include the small sample size and short study period. The unavailability of the molecular techniques for the diagnosis was a major limitation of the study. The use of virological and molecular tests instead of serological tests to confirm the cases in such studies would be more promising. However, the findings of this study are helpful in assessing the major risk factors associated with HIV infection among the pregnant women. This will help the health authorities and related department to develop an appropriate HIV control program among pregnant women so that the perinatal transmission could be avoided along with their progression to AIDS. It is essential to initiate the prevention program which should aim to modify the unhygienic sexual activities. Further studies are needed in a larger population to find out the exact scenario of HIV cases, so that the intervention steps would be effective.

The sero-prevalence of HIV among pregnant women in Kathmandu is higher. The results of this study provides essential information for an effective implementation of HIV/AIDS control programmes and also for monitoring HIV spread within a country especially from mother to child.

## Conflict of interest statement

We declare that we have no conflict of interest.

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