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Original Research Article

Prevalence of human immunodeficiency virus infection among primigravida, in Karnataka

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ABSTRACT

Background: Karnataka is one of the six high human immunodeficiency virus (HIV) prevalent states in India. We estimated prevalence among primigravida attending antenatal clinics in Karnataka, assuming this as a proxy for HIV incidence level in the general population.
Methods: We tried estimating prevalence among primigravida using cross sectional samples. Data was collected in structured data extraction sheet for the month of September 2011, from all Integrated and Counselling tested Centres (ICTCs) of Karnataka. All the pregnant women were tested as per national protocol. We analysed the basic demographic data, geographical distribution including HIV status of spouse of primigravida.
Results: In September 2011, 87580, pregnant women were tested and 238 (0.26%) were found HIV positive of which, 95 (40%) were primigravida. Prevalence among primigravida, was 0.3%. The prevalence among primigravida was highest in Bagalkot (1.6%) district. In Yadgir, Kodagu and Udupi the prevalence was zero. The high prevalent blocks were Jamakhandi, Mudhol, Gokak, Hospet and Muddebihal. 73.7% spouse of positive primigravida were tested for HIV and among those tested, 87.1% were found HIV positive.
Conclusions: There is striking difference in the prevalence of HIV among primigravida in different districts of Karnataka probably indicates the difference in effectiveness of preventive interventions in these districts and within blocks. The preventive programs should be reached out to the labourer's and farmers in the general population to prevent the new infections in the general population.

Keywords: HIV, Primigravida, Prevalence, Karnataka

INTRODUCTION

Recently infected persons contribute substantially to HIV transmission because of behavioural and biologic factors. Identifying these individuals could have important implications at individual and public health level.[1]

Thus, reliable estimates of the incidence of HIV infection in populations are crucial for describing the status of HIV epidemics, monitoring transmission patterns, evaluating prevention programs and the planning, design and evaluation of intervention programs. Changes in incidence are useful when gauging the effectiveness of prevention and treatment efforts.[2,3]

Although HIV incidence provides a more direct measure of the impact of HIV preventive and treatment programmes, it is more difficult to determine than

prevalence. Conducting cohort studies and performing biological assays that distinguish recent from established HIV infections are very expensive and logistically difficult to conduct on more representative population samples. Many studies have continued to use HIV prevalence among young people aged 15–24 years as a marker or indicator for HIV incidence. This age group has been found appropriate for estimating HIV incidence because it is less affected by AIDS related mortality and people in this age group are assumed to have engaged recently in sexual debut.[4]

HIV prevalence among young people aged 15–24 years is used as an indicator of the rate at which new infections occur (incidence). The United Nations General Assembly Special Session (UNGASS) on HIV and AIDS Declaration of 2001 set a goal of reducing the rate of HIV infection among young people aged 15–24 years and therefore countries are required to report on this indicator.[5]

India's last HIV estimations exercise conducted in 2015 projected that there would be around 21.1 lakhs [17.02 lakh to 26.49 lakh] people living with HIV (PLHIV) in 2016. This represents an overall adult (ages 15-49 years) prevalence of 0.25% [0.21%-0.31%]. The state of Andhra Pradesh (inclusive of Telangana) in that year was estimated to have the highest number of People Living with HIV, PLHIV (3.9 lakhs) followed by Maharashtra (3.0 lakhs) and Karnataka (2.0 lakh). Thus, Karnataka is one of the states with high burden of PLHIV.[6]

Thus, monitoring new infections in the 15 to 24 years primigravida, in the state of Karnataka on routine basis can help in monitoring the effectiveness of the preventive interventions. The annual estimated pregnancies in Karnataka is around 11.75 Lakh.[7]

During the year 2010-11 around 7.84 Lakhs, pregnant women were counselled and tested for HIV at ICTCs in Karnataka. Indicating 83 % of coverage for HIV testing. Karnataka is the first state in India to integrate HIV services with routine health services.[8] Hence, an attempt is being made to analyse routinely collected data at Integrated Counselling and testing Centres (ICTCs) registers and partly reported in computerized management information system (CMIS). The large coverage of HIV testing among the antenatal cases, gives good representation of data to track new infections at community level.

Based on the assumptions that pregnant women attending ANC are representative of general adult population of both males and females in the reproductive age group, this particular study was under taken to determine the HIV prevalence among primigravida tested at Integrated Counselling and testing Centres (ICTCs) in Karnataka.

METHODS

Type of ICTCs in Karnataka

The exclusive testing facilities under National AIDS Control Programme which is being manned by a Counsellor and Laboratory Technician are called Stand Alone ICTC. The standalone ICTCs are generally located in District Hospitals (DH), Community Health Centres (CHC) and some other facilities with high client loads.

The HIV testing is also carried at other facilities e.g. Primary Health Centres (PHC) where HIV counsellor and HIV Laboratory Technicians (LT) are not present. The counselling services to ANCs at PHCs or other facilities are provided by staff nurses/ auxiliary nurse midwifes and general laboratory technicians performs HIV testing, apart from other laboratory tests. Such centres are called facility Integrated ICTCs.

To capture the data from the private sector HIV testing is also done in Public Private Partnership (PPP) ICTCs. The PPP ICTC perform HIV counselling and testing as per National Protocol and HIV test kits are supplied free of cost to these centres and to the mobile ICTCs.

Study area

There are 30 districts in Karnataka. Data from all 30 districts of Karnataka has been considered for analysis.

Study period

One month, September 2011

Data collection tool

The data from all the districts of Karnataka was collected in structured format which was developed by national experts from National AIDS Control Organisation. The data extraction sheet had data elements on annual estimated number of pregnancies in the district, total number of pregnant women tested during the month, total number of primigravida tested during the month, number of primigravida found HIV positive. The date extraction sheet had additional information on age group, geographical block within a district, self-occupation of client and occupation of spouse and HIV testing and HIV status of spouse. An excel based data extraction sheet also included the Sub District (Taluka) wise break up of HIV positive primigravida.

Data collection

The data extraction sheet (structured excel format**)** was sent to the District AIDS Prevention & Control Officer (DAPCO). DAPCO, had in turn shared the structured format with all the counsellors providing ICTC services.

The data from all facilities was compiled at the district level by district AIDS prevention and control unit, (DAPCU) Monitoring and Evaluation Assistant.

Data cleaning and compilation

The District AIDS Prevention and Control Unit (DAPCU), Monitoring & Evaluation (M&E) Assistants compiled the data at the district level and forwarded the same to State AIDS Control Society. The data was validated and cleaned. The districts showing discrepancies in data were informed to recheck the data and send back the validated data.

Data analysis

The validated data of the primigravida was analysed in Microsoft excel, version 2007. Proportions were calculated and compared with HIV testing among pregnant women reported for September 2011 in computerized management information system (CMIS).

Secondary data analysis

The computerized management information system (CMIS) (National Programme data) reported data on HIV testing among the pregnant women for the month of September 2011, was also considered for comparison.

RESULTS

HIV testing among ANCs

As per CMIS data 87,580 pregnant women were tested during the month of September 2011, of which 28172 (32.2%) were primigravida (as per data extraction sheet). The highest proportion (58.8%) of primigravida were tested in Udupi district and lowest from (10.8%) Bangalore Rural district. Out of 97916, pregnant women expected to be tested for HIV, 87,580 were tested, indicating 89.2% coverage for the month of Sep. 2011.

Table 1: District wise HIV tested and found positive as reported in CMIS and Data extraction sheet.

		CMIS Data			Primigravida data from data extraction sheet				
S. No	**District**	**No of ANC tested**	**ANC detected HIV positive**	**% ANC detected HIV Positive**	**Total primig-ravida tested for HIV**	**No. of primig-ravida found positive for HIV**	**% Primigravida found HIV positive**	**% of primigravida tested among total ANCs tested for HIV**	**% of primig-ravida found HIV Positive among HIV positive ANCs**
1	Bagalkot	3433	24	0.7	496	8	1.6	14.4	33
2	Bangalore Rural	1216	1	0.08	131	1	0.8	10.8	100
3	Bangalore Urban	8667	30	0.35	1522	8	0.5	17.6	27
4	Belgaum	6154	23	0.37	2461	5	0.2	40	22
5	Bellary	5106	15	0.29	1943	9	0.5	38.1	60
6	Bidar	2999	6	0.2	994	2	0.2	33.1	33
7	Bijapur	4079	17	0.42	1263	11	0.9	31	65
8	Chamarajnagar	1374	6	0.44	703	5	0.7	51.2	83
9	Chikballapur	2158	11	0.51	802	4	0.5	37.2	36
10	Chikmagalore	1563	3	0.19	823	2	0.2	52.7	67
11	Chitradurga	2072	4	0.19	1013	3	0.3	48.9	75
12	Dakshin Kannada	2401	4	0.17	1073	3	0.3	44.7	75
13	Davangere	3042	5	0.16	1078	3	0.3	35.4	60
14	Dharwad	2767	7	0.25	1092	3	0.3	39.5	43
15	Gadag	2084	7	0.34	286	3	1	13.7	43
16	Gulburga	5136	9	0.18	1744	1	0.1	34	11
17	Hassan	2410	2	0.08	984	2	0.2	40.8	100
18	Haveri	2061	5	0.24	721	2	0.3	35	40
19	Kodagu	875	0	0	369	0	0	42.2	0
20	Kolar	2517	6	0.24	1039	2	0.2	41.3	33
21	Koppal	2814	12	0.43	1213	4	0.3	43.1	33
22	Mandya	2100	6	0.29	783	4	0.5	37.3	67
23	Mysore	4139	4	0.1	1759	1	0.1	42.5	25
24	Raichur	2899	13	0.45	966	2	0.2	33.3	15
25	Ramanagaram	1293	3	0.23	376	2	0.5	29.1	67
26	Shimoga	2642	2	0.08	1051	2	0.2	39.8	100
27	Tumkur	3840	5	0.13	1630	2	0.1	42.4	40
28	Udupi	1205	1	0.08	708	0	0	58.8	0
29	Uttar Kannada	1943	2	0.1	718	1	0.1	37	50
30	Yadgir	2427	5	0.21	754	0	0	31.1	0
	Karnataka	87416	238	0.27	28172	95	0.3	32.2	40

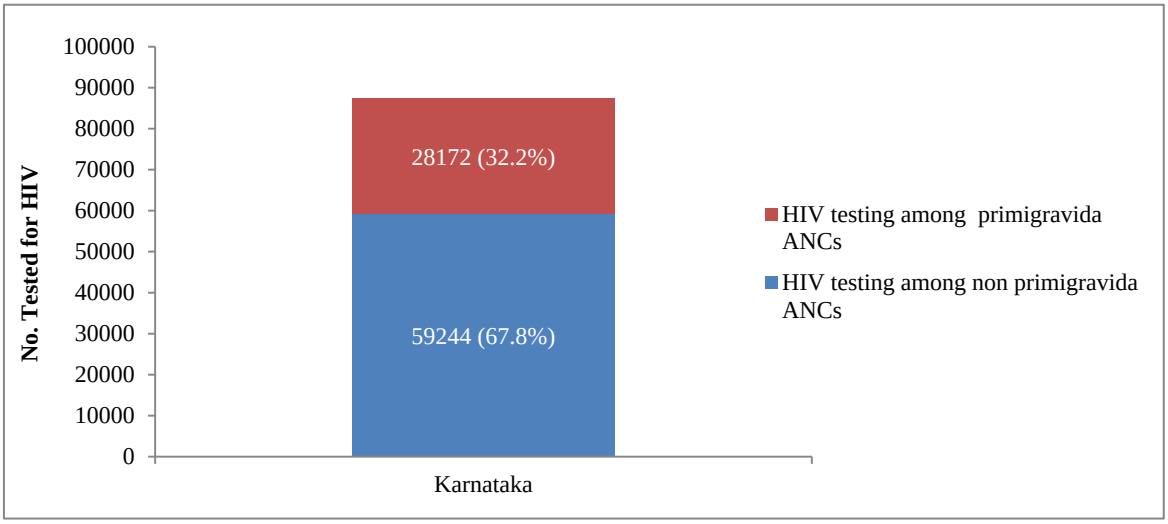

Figure 1: Number of ANCs tested for HIV in Karnataka, September 2011.

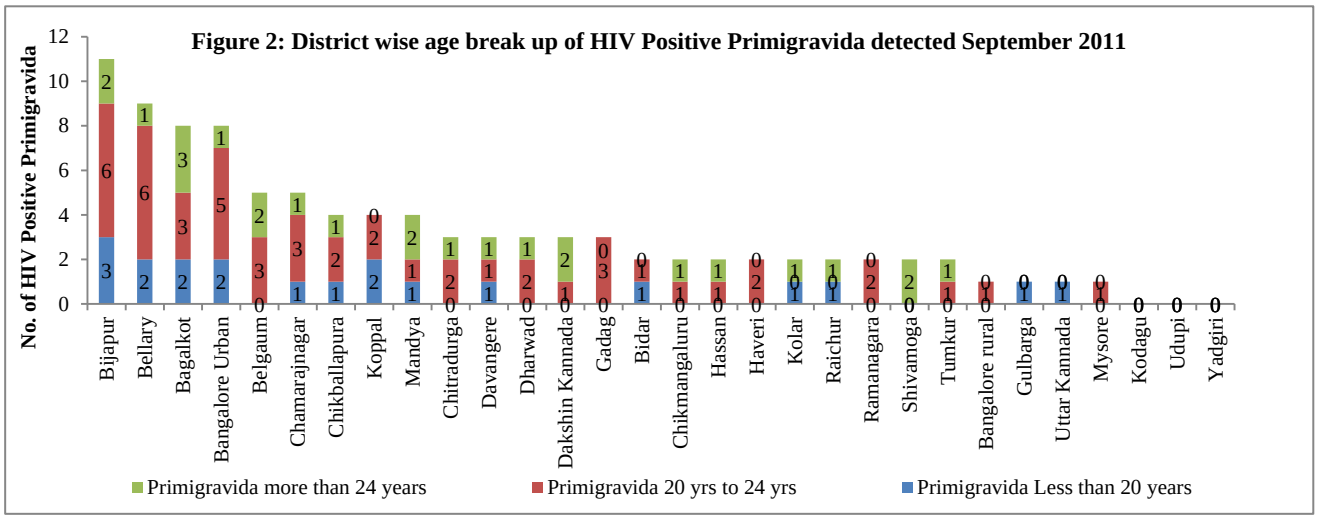

Figure 2: District wise age break up of HIV positive primigravida detected during September 2011.

District wise HIV positivity (%) among ANC

Overall HIV positivity among ANC was 0.27%. The positivity ranged from 0.7% in Bagalkot district to 0.0 % in Kodagu district.

District wise HIV positivity (%) among primigravida

Out of 238 HIV positive pregnant women, 95 (40%) were primigravida. Among ANC detected HIV positive, exclusively primigravida were found to be HIV positive in Bangalore Rural, Hassan and Shimoga districts. In Kodagu, Udupi and Yadgir districts none of the primigravida's was found HIV positive.

Age group of primigravida

Out of 95 primigravida found HIV positive, 53% of primigravida were in the age group of 20-24 years, 26% of primigravida were above the age of 24 years.

Occupation of primigravida

Majority (72%) of primigravida were housewife and 24% of primigravida were laborers (Figure 4).

HIV testing of spouse / partner of HIV positive primigravida

In Karnataka HIV testing among spouse / partner of the primigravida was 73.7%. Among those tested, 87.1% of the spouse partner was found HIV positive. None of the spouse / partners of the HIV positive primigravida from Gulbarga and Chikmangalur districts took HIV testing.

Occupation of spouse of primigravida

Out of 95 primigravida found HIV positive, 64% of the primigravida spouses were labourers, followed by 24 % were farmers, 2% were in service sector and 7% were in others occupation.

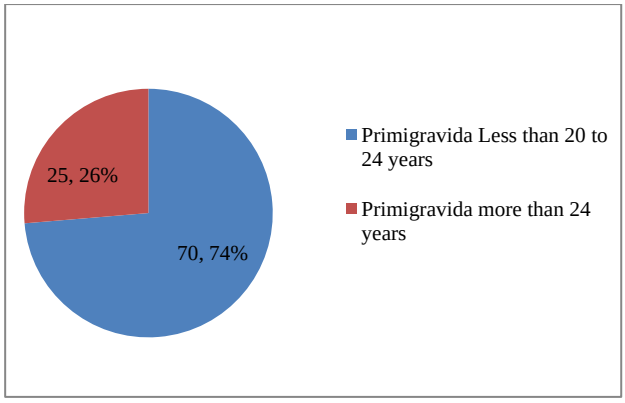

Figure 3: Age breakup of HIV positive Primigravida in Karnataka.

Blocks wise HIV positivity

The high prevalent blocks of Karnataka were Jamakhandi, Mudhol, Gokak, Hospet and Muddebihal.

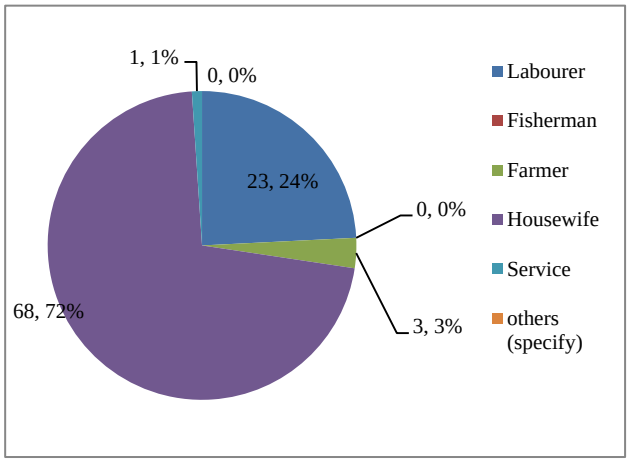

Figure 4: Occupation of HIV positive Primigravida-Karnataka.

DISCUSSION

In summary, out of 30 districts of Karnataka, at least one primigravida was found HIV positive in 27 districts during the period of one month. This indicates the very low level of new HIV infections in the general populations in most of the districts of Karnataka. The 3 districts namely Udupi, Kodagu and Yadgir districts none of the primigravida was found HIV positive. There were wide variations in the number of HIV positive primigravida in the districts across the state. The highest HIV positivity was among the primigravida of Bagalkot (1.6%) district and followed by Gadag district.

Most of the studies done across the world have used HIV sentinel surveillance data among 15 to 25 years age group women to estimate HIV incidence. We used routine ICTC data for one month in our study.

According to a report by UNICEF, in 2012 an estimated 40% of pregnant women in low- and middle-income countries received HIV testing, which represented an increase from 30% in 2010 and 8% in 2005.[9] However, in our study the uptake of HIV testing was very high 89.2% more than 2 times of the globally reported coverage of HIV testing among pregnant women during the same time.

A study done in Pune, India by Gupte and et al between 2002 and 2005, among 26,654 (84.9%) pregnant women, of which 8,597 were primigravida in the age group of 18-27 years. Have reported decline in HIV infection risk over 3 years, among primigravida. Estimated HIV incidence decreased from 2.4/100 PY (95% CI 1.7-3.3) in 2002/03 to 0.53/100 PY (95% CI 0.3-0.9) in 2005.[10] In our study, only one-point data has been analysed and we can't comment on trend of HIV infection among this group in Karnataka.

Similarly, HIV prevalence among young pregnant women (aged 15–24 years) attending ANCs between 2000–2007 in Uganda and between 2000–2005 in Kenya were used as a proxy for HIV incidence trends in the general population. Sites that were consistently included in national surveillance over time were included in the analysis. Results indicated a significant decline in HIV prevalence between 2000 and 2005 overall and for both urban and rural areas in Kenya. In Uganda, incidence remained stable at approximately 0.7% from 2000–07.[11]

Similar findings were observed in Zambia, where HIV prevalence among young women aged 15–24 years has decreased substantially in both urban (median 27.4% to 15.5%) and rural (median 11.4% to 6.4%) HIV Sentinel sites during the period 1994–2000.[12]

In our study most of the primigravida were married and their spouse/ partner were also infected with HIV. Indicating, acquiring infections after marriage. Findings of our study is in contract to the findings reported in South Africa. The risk factor analysis of these cohorts of women from various HIV prevention trials suggest that being under the age of 25 years, having had one sexually transmitted infection (STI) in the past and being unmarried were significantly associated with high risk of HIV seroconversion.[13,14]

In our study, majority of the primigravida were housewife and 25% were labourer and majority of them reported their spouse to be labourer, indicating these women from low socio-economic strata. Thus, the findings are very concord with findings in other low-income countries. Thus, poverty is another driving force of HIV transmission in women.[15,16] Evidence from Sub Saharan Africa, Asia and Latin America demonstrates that greater national-level income inequality is associated with higher HIV prevalence rates.[17] Low economic status has been associated with earlier sexual experience, lower condom uses at last sex act, having multiple sex partners,

increased chances that the first sex act is non-consensual, and a greater likelihood of having had transactional sex or physically forced sex.[18]

HIV infections among primigravida and high sero-prevalence among their spouse partner, also indicate that behaviour of the partner before marriage determines the HIV prevalence among women in India, in general population. Findings of our study is similar to that of studies in Africa demonstrated a correlation between having sex at an early age and the HIV incidence.[19,20]

Some countries have demonstrated delay in sexual debut can delay in acquiring HIV infections.[21] In Uganda it is thought that the delay of sexual debut might have been one of the crucial behaviour changes which led to a decline in HIV infection in Uganda.[22] However, in our study, the married women had no choice to delay the sexual debut and unprotected sex with the infected spouse / partner were the main reason for acquiring the infection at young age. Thus, the findings of our study are in contrast to the findings of African countries were two aspects of behaviour, time sexually active, before marriage and remarriage patterns, emerge as strongly associated with infection, and point to the complex dynamic interplay between partnership behaviours and HIV risk.

In short, the women least likely to be infected were those who married soon after first sex and who stayed married although the benefit of marriage may be confined to the early years as indicated by the lower odds of infection experienced by women married for less than one year compared to those who had been married for longer. Thus, the behaviour of the partner is a critical determinant of HIV risk in a marriage.[23]

Young married primigravida are at higher risk of HIV infection. Findings of our study are very similar to that reported in Sub Saharan Africa. The evidence shows that women in Sub Saharan Africa are at higher risk of HIV infection compared to their male counterparts. Through gender power dynamics, women are embedded in relationships which increase their risk even more.[24]

Population-based survey designs are the gold standard in the provision of valid HIV estimates. However, they are time consuming and needs heavy investment in terms of time and money. In India, ANC-based sentinel surveillance has been and continues to be an instrumental data source for estimating HIV prevalence and incidence trends over time. However, these estimates are done at state level. It is difficult for the district and state level managers to utilize the state estimates at district and sub-district level. Thus, simple differential analysis (age, occupation and geographical area the primigravida belongs to) of the existing data of ICIC on regular basis can help monitor, the HIV incidence at state, district and sub- district level.

CONCLUSION

Out of 95 primigravida detected HIV positive, 74% of primigravida were in the age group of 20 to 24 years, indicating new infections of HIV in the general population. There is striking difference in HIV positivity of primigravida among the districts probably indicates the difference in effectiveness of prevention interventions in these districts and within blocks. There is need to spread preventive messages among labourer's, farmers and low socio-economic population in the general population to prevent the new infections in the community.

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