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Original Research Article

Prevalence and factors associated with syphilis among pregnant women attending antenatal care, Khartoum State, Sudan

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ABSTRACT

Background: The aim of this study was to determine the seroprevalence, predisposing factors of syphilis among the pregnant women attending antenatal care service, Khartoum state 2009.
Methods: Descriptive cross- sectional study conducted among a simple random sample of 700 pregnant women attending antenatal care (ANC) services in Khartoum State health facilities. The data were collected by a questionnaire and blood samples investigation by using the Rapid Plasma Reagent Test (RPR). Descriptive method as well as inferential statistics were used for data analysis.
Results: Most of the respondents were housewives (90.7%). (92%) of them were married for the first time, 81.1% had formal education. 39% know nothing about syphilis. Only 13.5 % knew the right causative agent, but some of them had information about the ways of protection. 38% of them had knowledge about unsafe or unprotected sex. 26% mentioned that having sex with one partner is very important for their safety. The most common sources of their information were friends followed by TV, radio and health personal. The overall Syphilis sero-prevalence was (3%). (63.6%) of the respondents knew about the possibility of transmission from the infected pregnant mother to her child. only (44.6%) of them heard about condoms, of them only (47.3%) had seen condoms and (50.8 %) knew from where to get it. 33.3% had used the condoms. (3%) of the participating pregnant ladies stated that they had sex outside the marriage and (73%) of them had it during marriage.
Conclusions: The main recommendations were to augment syphilis diagnosis and treatment in antenatal care service and sexually transmitted disease programs, and to conduct effective health education programs to raise the awareness about the disease, its prevention and control to the good of the pregnant ladies and to the community at large.

Keywords: Condom, Khartoum, Seroprevalence, Syphilis

INTRODUCTION

Syphilis remains a significant cause of preventable prenatal death in developing countries, with many women remaining untested and hence untreated. Syphilis is found worldwide an estimated 12 million cases occurred every year. An estimated 50% of these pregnancies will end in fetal or prenatal death, low birth weight babies or babies born with congenital syphilis. In United States, syphilis is the third most common sexually transmitted disease.[1]

One of the most serious complications of the syphilis with pregnancy is the congenital syphilis, occurs when babies contract syphilis from their mother either through the placenta or when passing through the vagina at birth.

The early signs of congenital syphilis generally appear from three to eight weeks after a baby is born. Even though these symptoms develop soon after birth, most cases go unnoticed until late congenital symptoms appear in childhood or adolescence.[2]

According to the Centers for Disease Control and Prevention (CDC), untreated syphilis during pregnancy results in stillbirth or death of the infant in 40% of the cases. The CDC also reports that women who acquired syphilis and were untreated in the four years preceding pregnancy passed it on to their baby in 70% of the cases Infants of pregnant women adequately treated with penicillin during pregnancy have a minimal risk of developing congenital syphilis.[3]

A study conducted in 1999 in Sudan to determine the sero-prevalence of syphilis amongst pregnant women attending different antenatal clinics in the Tri-capital Khartoum, Sudan. This was accomplished through comparisons between the performances of different types of syphilis diagnostic tests. The study reported that the prevalence of syphilis among pregnant women in Sudan is 9%.[4]

Another study conducted in Khartoum state in 1999 to establish the prevalence of syphilis and other STIs among pregnant women, to identify any risk factors and to suggest management. The prevalence of syphilis among the study population was established 2%.[5] Khartoum state is known to be one of the highest prevalence states in transmission of STIs, estimate number of reported female cases in 2008 were (41309 cases). There were no data available about the syphilis cases or prevalence.[6]

Although many previous studies of syphilis were done in Khartoum State, most of these studies handled the disease as only one of the sexually transmitted diseases. To our knowledge, no specific study was done concerning syphilis among pregnant women. Therefore, the purpose of this study was to determine the prevalence of syphilis, predisposing factors and outcome among pregnant women attending antenatal services in Khartoum state health facilities. The findings will be used to help implementing intervention programs (syphilis screening during pregnancy), guide policy formulation and as an advocacy tool for raising public awareness.

METHODS

This is a descriptive cross-sectional facility-based study conducted in Khartoum state the capital of Sudan (political and commercial center), and it is one of the 25 states of Sudan. It is of 20140 km square and situated in the center of Sudan the state has been divided in to 7 localities and 19 administrative units, Population now is 6649564 amounting to an average annual growth rate of 3.670. The women in childbearing age are 1649092 and pregnant ladies are 224090 In Khartoum state there are 591 health facilities (health centers and hospitals) providing ANC service.

Study population, inclusion and exclusion criteria

All pregnant women resident in the state for the last one year, attending ANC service in Khartoum state. Inclusion criteria was determined as all pregnant women, resident in the state for the last one year and accepting to participate in the study, while the exclusion criteria were; Visiting pregnant women, or these who moved to the state in less than one year; non pregnant women who attend ANC; women who were severely ill.

Sample size and design

Sample size was determined using cross-sectional survey formula, depending on Z=the value of normal curve corresponding to the level of confidence of 95% which is 1.96, desired margin of error = 5% and probability of disease = 0.09, the resulting sample size was 700 women. Pregnant ladies in ANC were selected using the stratified systematic random sampling technique.

The whole state was divided into seven strata; this stratification was based on the classification of the localities including all rural and urban settings. Governmental health centers, nongovernmental health centers and hospitals were included in the sample. The selection of health facilities was proportional to population size of the locality. Eligible women attending ANC will be taken until reaching the sample size. According to daily ANC attendance not less than 10 pregnant women per day attend the service. The frame includes 62 governmental health center, 135 nongovernmental health centers and 26 hospitals.

Data collection

Quantitative data was collected using face to face questionnaire and blood sampling for laboratory investigation.

Questionnaire

Data was collected using standard questionnaire. A preceded, structured questioner with close and open ended questions was used, through face to face interview with the target groups. The questionnaire was adapted from a Family Health International (FHI) standard Behavior Surveillance Survey (BSS) questionnaire. The questionnaire consisted of five sections (socio demographic data, knowledge about syphilis, sexual behaviors and practices towards syphilis, knowledge behaviors and Practices about condoms, knowledge behaviors and Practices about STIs and health care-seeking Behavior, information and communication channels).

Laboratory investigations

Under aseptic conditions using gloves, tourniquet 2-3 ml s of venous blood was drowning into blood collection containers with anti-coagulant; the samples were collected and brought to the state laboratory. The serum first tested with a rapid syphilis test (RPR). And the

positive ones were confirmed with Treponema pallidum particle agglutination assay (TPPA).

Piloting and field survey

A training work-shop on how to select the respondents, as well as completing the questionnaire was carried out and the data collectors were trained in order to ensure the validity of information, voluntary participation, confidentiality and securing the consent of the participants. The field teams also included field supervisors, who were responsible for regular supervisory visits and conducting daily check on questionnaires. A pilot survey took place before the actual collection started, and it was an opportunity to check on the training of data collectors and supervisors and to amend the questionnaire.

Data management and analysis

The questionnaires were reviewed for completeness and consistency; open ended questions were coded. The data were double entered by two different persons. The data cleaned and analyzed using SPSS (version 11.5). Descriptive statistics, cross tabulation and Pearson chi square to test for statistical associations were conducted. A p-value <0.05 was considered statistically significant. Data presented in the forms of graphs and tables.

Informed written consent from all respondents was obtained. Interviewers were trained to explain to eligible subjects the purpose of the survey and to ensure confidentiality and privacy so as to get verbal and written consent from them. Names and identification marks were written on respondents' questionnaires. Interviewers were informed to respect the rights of those who chose not to participate in the stud and thank them for their time. The research proposal was approved from the ethical clearance committee in Khartoum State Ministry of Health. Furthermore, any lady who was detected to suffering from the disease was treated.

RESULTS

Following socioeconomic findings were derived from answers of the investigated ladies; Table 1 displays the distribution of the age groups. The mean age of the target group was 27 years, the maximum was 56years and the minimum was 14 years the pregnant ladies were divided into 8 age groups ranking from youngest to elder, the distribution was shown in table, 58.7 % of them were in the age group 20-29 years old. Regarding the religion of the investigated ladies the most of them were Muslims as shown in the same table.

The educational level of the pregnant ladies were distributed as in (Table 1), where 80% of them had a primary education as minimum, the illiterate ones were 118 (16.9%) of the investigated.

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Table 1: Background characteristics of the studied population.

Characteristics	Frequency	Percent
Age groups		
<20	73	10.4
20-24	213	30.4
25-29	198	28.3
30-34	128	18.3
35-39	80	11.5
40-44	5	0.7
45-49	3	0.4
Religion		
Muslims	646	92.3
Christians	53	7.5
Others	1	0.2
Educational level		
Illiterate	118	16.9
Khalwa	14	2
Primary	280	40
Intermediate	21	3
Secondary	176	25.1
University	87	12.4
Postgraduate	4	0.6
Total	700	100

Figure 1 presents the results of seropositive Syphilis test among study participants. According to the graph and out of 700 sample 21 (3.0%) were positive for Syphilis, with 95% confidence intervals (2.0-4.5).

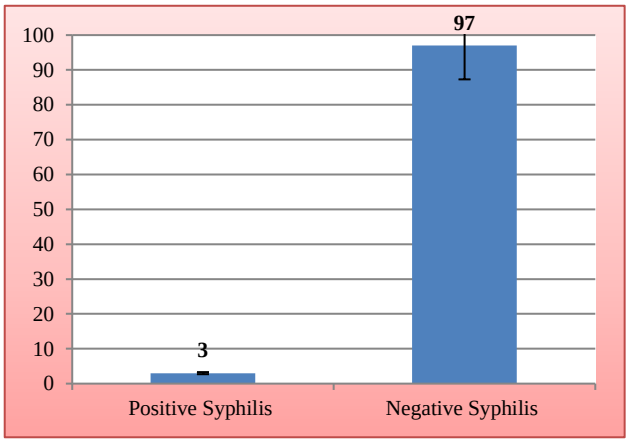

Figure 1: Prevalence of syphilis among study participants.

Concerning condoms use, 41% pregnant women reported condom use condoms, the main reasons of using the condoms were for the protection from the STIs and as family planning method, others used due to partner desire (Figure 2).

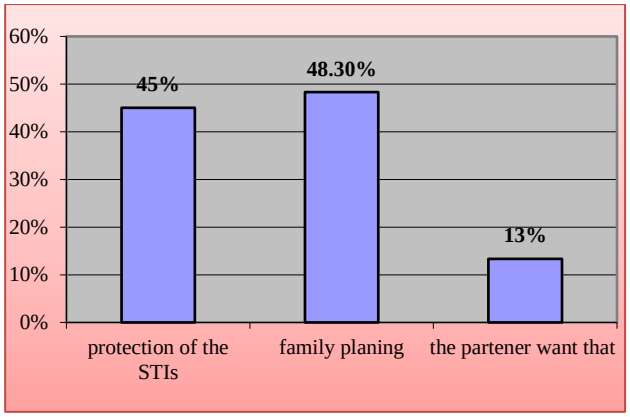

Figure 2: Distribution of the respondents by the causes of condom use.

Table 2 illustrates the distribution of ladies according to their knowledge about Syphilis. The table further showed that 39% knew nothing about it.

Table 2: Distribution of the respondents by their knowledge about Syphilis.

Percent	Frequency	Characteristics
Knowledge about Syphilis		
Yes	427	61
No	273	39
Source of knowledge about syphilis		
HIV program	14	2
Books	119	17
Friends	210	30
Public meetings	105	15
TV	133	19
Radio	119	17
Knowledge about causative agent causative agent		
Bacterial	93	13
Viral	119	17
Don't know	487	70
Knowledge about ways of protection ways of protection		
Unsafe sex	265	37.9
One partner	181	25.8
Cutting instruments	31	4.4
Good nutrition	25	3.5
Condoms	23	3.3
Blood transfusion	20	2.8
Touching infected person	13	1.9
Insects	11	1.6
Others	130	18.6
Mother to child transmission		
True	273	63.6
False	45	10.5
Don't know	111	25.9
Total	700	100

The most common way the target group had the information about disease was friends, followed by the TV and radio, other sources were the family, school, hospital, doctors and already diseased ladies. When we assessed the accuracy of the information that they had we found only 13.5% of the ladies who said they knew about the disease knew the right causative agent.

Table 3: Association between sexual risky behavior of the ladies and some selected factors.

Characteristic	Practicing sex outside marriage			P. value
	Yes, now	Yes, in the past	Yes, before marriage	
Educational level				
Illiterate	40.0%	60.0%	0.0%	
Primary	0.0%	72.7%	27.3%	0.15
secondary	33.3%	33.3%	33.3%	
university	0.0%	33.3%	66.7%	
Age groups				
<20	0.0%	100.0%	0.0%	
20-24	0.0%	3.3%	1.4%	
25-29	1.0%	0.5%	1.0%	0.25
30-34	0.0%	1.6%	0.8%	
35-39	1.3%	1.3%	0.0%	
40+	0.0	0.0	0.0	
Syphilis level of knowledge				
Poor	0%	28.6%	25%	0.04
Moderate	100%	71.4	75%	
Good	0%	0%	0%	
Symptoms (genital ulcer)				
Yes	0.0%	15.4%	33.3%	0.01
No	100%	84.6%	66.7%	
Total	14%	59%	27%	100%

Table 3 assesses the association between sexual risky behavior and some selected variables. Women age group distribution showed that the elder pregnant ladies (age group 40 and above) were never practice sex outside the marriage, the others reported that they practiced it in the past while two age groups (29-25 and 35-39) reported that they have such practices now. When we look to the relation between educational level and practicing risky sex behavior, we found that; most of the ladies who were practicing sex outside the marriage were illiterate, 40% of this group who had such practices are still doing it. The ones who were practicing that in the past time while they were married the majority were with primary education and those who had a university education, most of them had such practice before marriage.

DISCUSSION

This study attempted to estimate the prevalence of syphilis among pregnant women attending antenatal care services in Khartoum state. During ANC sessions a standardized questionnaire was administered to collect socio-demographic and behavioral characteristics of pregnant women. Syphilis serology was performed using

rapid plasma reagent (RPR) slide test and Treponema pallidum haemagglutination assay (TPHA). All subjects dually reactive to RPR slide test and TPHA were considered as having active syphilis. Overall 700 pregnant women were screened. Syphilis seroprevalence was (3%), this was high prevalence when we compared it with the previous studies in Khartoum 1999 the prevalence was (2%), in Yei town South Sudan 2002-2003the prevalence was (1%), Rumbek town 4.2%.[7,8]

The mean age of the women was 27 years (range 14-56), similar to the results of another studies in Mozambique and North West Ethiopia to determine the prevalence of syphilis in women attending antenatal care the mean age was 25 years old.[9]

All the investigated ladies were married and (92%) of them were Moslems, while in the study done in Ethiopia the majority were orthodox Christians (97.4%) and (92.6%) were married but in study done in china the Syphilis was significantly associated with unmarried status, less education, multiple sex partners.[9]

When we assessed the pregnant ladies' knowledge about the disease, of them (39%) knew nothing about it and the most common method from which they got the information about the disease was friends followed by the TV and radio. Other sources were the family, the school and health personal. But when we assessed the accuracy of the information, among the ladies who said they knew about the disease only (13.5 %) knew the right causative agent.

Although they didn't know about the causative agent but the majority had good information about the methods of protection. (38%) of them talked about unsafe or unprotected sex as a big risk behavior and (26%) mentioned that having sex with one partner is very important. In Ethiopian study there was significant association between a past history of sexually transmitted diseases and the positive cases, the similar results were in China were Syphilis was significantly associated with previous sexually transmitted infections.[9,10]

The misconception about the mode of transmission of the infection was not that big it ranged between (3.9%) for good nutrition and (0.9%) for using public toilets. The good point was that most of them were talking about the possibility of the transmission from the infected pregnant mother to her child. One of the most important factors in the transition of the disease is the risk sexual practices. In our study only (3%) of ladies answered that they had sex relations outside the marriage, (14%) of them continued to practice it now, (59%) practiced it in the past during the marriage and (27%) were practicing before the marriage. This behavior is similar to studies conducted in Sub-Saharan Africa.[11]

One of the potential limitations of this study is that it was based on a cross-sectional survey design, the direction of relationships and causal relationships cannot be determined. In addition to that, the use of a self-administered questionnaire on sensitive issues may produce subjective measurements which are less reliable than objective methods. Despite these limitations, the study updated our knowledge about the seroprevalence, predisposing factors of syphilis among the pregnant women attending antenatal care service in Sudan and emphasized the role of health education in improving sexual health among the study population.

CONCLUSION

The sero-prevalence of syphilis was found to be (3%) among pregnant ladies attending antenatal care service in Khartoum state 2009. The lack of knowledge about the disease, its mode of transmission, way of protection, the misconceptions about the disease and the low health care seeking behavior were the factors behind this high prevalence. The source of knowledge were friends, followed by TV, then Radio and other less important sources e.g. school, health workers and public talks. All cases picked in the antenatal care services were offered specialist care. No complications of the neither disease nor child illness were observed during the study.

Recommendations

The study recommends augment antenatal services by increasing access and implementing a strong program to deal with STIs and syphilis in particular; offer free and routine examination for syphilis in antenatal care and provide treatment and finally plan and implement an effective health education program to target females at child bearing age and the community regarding syphilis as disease, mode of spread, preventive measures and enhance treatment seeking behavior.

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