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Knowledge and attitude of pregnant women regarding HIV transmission, prevention and associated factors in Karachi, Pakistan – A cross-sectional study

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ABSTRACT

Objectives: This study aimed to assess the misconceptions and attitude regarding HIV transmission and prevention among antenatal mothers, with regards to mother-to-child-transmission (MTCT) in three tertiary care hospitals of Karachi.

Methods: A cross-sectional study comprising 350 pregnant females was conducted at three tertiary care hospitals in Karachi for 4 months, in 2018. A structured questionnaire covering knowledge about MTCT, prevention of mother-to-child-transmission (PMTCT) and attitudes about HIV transmission was used and all collected data entered and analyzed via SPSS (Statistical Package for the Social Sciences) software version 25, owned by the IBM Company.

Principle Results: Of the 350 pregnant females participating, around 66.7% (N = 232) were urban residents, lying in their mid-twenties and over 86% (N = 303) were Muslims. Over 14.3% (N = 52) of the participants had full knowledge regarding MTCT of HIV, with only 6% of the respondents having full knowledge related to PMTCT of HIV. Significant associations were found between knowledge about MTCT and residence (p = 0.001), education level (p = 0.001) and expected response from the partner (p = 0.001). While only 17% (60 out of 350) women agreed to invite their partner for testing, 84% showed an interest in looking after an HIV infected family member and 49% believed that all pregnant females should be tested for HIV.

Conclusions: This study shows that majority of the pregnant women in Karachi are unaware of MTCT and PMTCT and they are reluctant towards routine HIV testing. Thus, we see the need for collective and focused efforts for educational programs and further research.

Introduction

The Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) is one of the most alarming public health challenges faced by the world today, with over 35.4 million deaths since the beginning of this pandemic [1]. Currently, 0.15 million people are living with HIV in Pakistan, where the main modes of transmission are: heterosexual contact (52.55%), blood transfusions (11.73%), injecting drugs (2.02%), male-to-male sexual contact (4.55%) and mother-to-child-transmission (MTCT 2.2%), with 26.9% of transmission cases remaining unidentified [2,3].

Many HIV cases in the country are not even reported, owing to the poor socioeconomic conditions, social denial and stigma regarding sexually transmitted diseases (STDs), low literacy rates and lack of awareness [4]. Considering the above-mentioned factors and the unavailability of a vaccine and curative drugs, prevention qualifies as the most effective strategy to deal with this epidemic [5]. Although the vast majority of HIV infected individuals belong to high risk groups of injection drug users, men who have sex with men and commercial sex workers, the virus has spread from isolated teams into the public - particularly to female spouses of infected men and their children, who are at equal risk through vertical transmission [6–10]. MTCT stands out as a mode of transmission as it represents over 90% of new HIV infections in children and can happen amid pregnancy, labor and breastfeeding [11]. The prevention of HIV transmission in the general population is greatly hindered since women are more likely to be

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subjected to sociocultural barriers and gender-based discrimination [12]. According to an estimate by The World Health Organization (WHO) in 2010, in low- and middle-income countries, only 35% of expecting mothers received HIV testing, and less than half of those infected accessed anti-retrovirals (ARVs) for prevention of MTCT (PMTCT) [13].

A considerable number of studies have been done concerning HIV/AIDS, but very few have been carried out regarding the knowledge of vertical transmission of HIV among women in Pakistan. It is imperative for a pregnant woman to be aware about the vertical transmission and prevention of HIV, as it can be transmitted to a child from a seemingly healthy and symptomless mother due to the clinical features of AIDS developing after a median of four to five years of infection with HIV [14]. In the same light, the objective of this study was to assess the misconceptions, beliefs and attitude regarding HIV transmission and prevention among antenatal mothers in three tertiary care hospitals of Karachi and explore the factors associated with their knowledge so as to evaluate how to improve the current scenario.

Methodology

Study design and subjects

A cross sectional study was conducted at three tertiary care hospitals in Karachi for a span of 4 months, in 2018. Pregnant women coming to the outpatient department (OB/GYNE) of the hospitals under consideration were invited to participate based on convenience sampling. Those who consented were considered eligible regardless of their gravid status and duration of pregnancy. Those who were seriously ill or in labor at the time of the study were excluded.

Sample size and sampling technique

The sample size was calculated via the software 'openepi.com,' assuming: 95% confidence interval (CI), 5% margin of error and 50% anticipated frequency. With the addition of 5% nonresponse rate, the total calculated sample size became 403.

During the study period, 403 pregnant women were approached using a convenience sampling method, to assess their eligibility for inclusion in this study. 350 consented, resulting in an overall response rate of 87%.

Data collection and analysis

Data collectors received uniform training and completeness of the questionnaire was checked. Data coding, cleaning, and verification to assure data quality. The structured questionnaire consisted of questions on: socio-demographic characteristics, knowledge about mother to child transmission (MTCT) of HIV, its prevention (PMTCT), attitude regarding HIV and partner's response on positive HIV test results. A pilot study was run on 40 participants and their feedback used to modify the questionnaire for improved comprehension.

The index for knowledge about mother to child transmission (MTCT) of HIV was built from the answers to three questions (MTCT during pregnancy, during delivery, and through breastfeeding); following which it was categorized as 'not full knowledge' (score < 3) and 'full knowledge' (score $= 3$).

The index for PMTCT was built from the answers to three questions (using antiretroviral therapy [ART] drugs, safe delivery, and only breastfeeding up to 6 months); then, the index was categorized as mentioned above.

Attitude regarding HIV was gauged via 3 questions, namely: the willingness to take care of an infected family member, willingness to invite partner for testing and stance on testing all pregnant women for HIV.

All collected data were entered and analyzed in SPSS version 25, statistical package software. We used descriptive statistics such as frequencies and proportions to represent the study population with its related variables. Bivariate analysis was done for all the variables related to knowledge about mother to child transmission (MTCT) of HIV; level of significance was $P < 0.05$.

Ethical consideration

Ethical approval, clearance and permission to conduct the study were obtained from the health facilities. Verbal informed consent was obtained from every participant. Confidentiality was ensured by instructing all data collectors about observing strict measures - both during and after data collection.

Results

Demographics

Out of the total 403 pregnant women expected to appear in the study, 350 participated fully, yielding a response rate of 87% (N = 403). Around two-thirds (N = 232) of the participants were urban residents, lying in their mid-twenties (mean age: 25.6 years) and over eighty-six percent (N = 303) were Muslims. More than half of the respondents (N = 207) had received primary education or less and were housewives (N = 181) with almost three-fourth of the women (N = 255) having their monthly income < 30,000 PKR (Table 1).

Knowledge of MTCT and its prevention

The results show that only over one-seventh (N = 52) of the participants had full knowledge regarding MTCT of HIV, with only 6% of the respondents having full knowledge related to PMTCT of HIV. Regarding transmission mode: 40.3%, 37.3% and 22.4% (where N = 350) of the women claimed to have known about MTCT of HIV during delivery, during pregnancy and through breastfeeding, respectively. A mere 38.9%, 27.4% and 33.7% (where N = 350) of the females knew that effective utilization of ART drugs, having safe delivery and exclusive breast feeding for 6 months, respectively, can help in the prevention of MTCT of HIV (Tables 2 and 3).

Predictors regarding knowledge about MTCT

It emerged that out of the 52 pregnant women that had full knowledge regarding MTCT of HIV, over 90% hailed from an urban residence and had received higher education. More than half of these 52 were jobholders, and 82% expected positive partner's reaction to positive HIV test result. Of the remaining sixth-sevenths (N = 298) having incomplete knowledge regarding MTCT: 50% of women lived in the urban areas, over 40% lived in the rural sector, more than three-fifths of the women (68.4%) had received less than primary level of education, more than half were house wives and over 90% expected negative partner's reaction to positive HIV test result (Table 4). As shown, we found significant associations between knowledge about MTCT and residence (p = 0.001), education level (p = 0.001) and expected response from the partner (p = 0.001).

Table 1
Baseline demographics of the included pregnant females (N = 350).

Variable	Number	Percentage
Urban residence	232	92.8
Mean age (years)	25.6 ± 7	
Religion Islam	303	86.6
Primary education or less	207	59.1
Housewife	181	51.7
Household income < 30000 (rupees)	255	72.9

Table 2
Knowledge on MTCT among pregnant women attending antenatal care services at three tertiary care hospitals in Karachi, 2018 (N = 350).

Variable	Number	Percentage
Full Knowledge on MTCT		
Yes	52	14.8
No	298	85.2
MTCT could occur		
During delivery	106	40.3
During pregnancy	98	37.3
During breast feeding	59	22.4

Abbreviations: MTCT, mother-to- child transmission.

Table 3
Knowledge on PMTCT among pregnant women attending antenatal care services at three tertiary care hospitals in Karachi, 2018 (N = 350).

Variable	Number	Percentage
Full Knowledge on PMTCT		
Yes	21	6
No	329	94
PMTCT can be done by		
ART drugs	37	38.9
Safe delivery	26	27.4
Breast feeding up to 6 months	32	33.7

Abbreviations: PMTCT, Prevention of mother-to-child transmission, ART drugs, Anti-retroviral drugs.

Table 4
Predictors regarding knowledge about MTCT.

Variable	Full Knowledge (52)	Not full knowledge (2 9 8)	P- Value
Residence			
Urban residence	50	172	0.001
Rural residence	2	126	
Education			
Primary education or less	3	204	0.001
Higher education	49	94	
Occupation			
Housewife	21	160	0.08
Not housewife	31	138	
Expected partner's reaction to positive HIV test result			
Positive	43	24	0.001
Negative	9	274	

Abbreviation: MTCT, mother-to-child transmission.

Attitude

Only 17% (60 out of 350) women agreed to invite their partner for testing. The most common reason for denial of invitation was possible anger by the partner, with 84% of the females showing interest to look after an HIV infected family member and 49% being of the opinion that all pregnant females should be tested for HIV.

Discussion

In exploring the knowledge of MTCT and PMTCT of HIV among pregnant women in Karachi, this study revealed several key findings. Firstly, our results highlighted that majority of the respondents (85.2%) did not have full knowledge of MTCT. When comparing our outcomes with those of more seasoned studies, this percentage was considerably higher than those from South Africa (61.7%), Tanzania (50%), Northwest Ethiopia (42.5%), Nigeria (25.5%), Ghana (12.3%) and Gondar (11.5%) [15]. Secondly, it was established that 94% of the women did not have full knowledge of PMTCT, hence portraying more women as being uninformed about PMTCT than MTCT. This proportion proved to be notably higher to the statistics obtained from other countries as well [15]. This huge disparity may be attributed to several reasons, with stigmatization of HIV in Karachi's society being the most significant one. Majority of the citizens relate sexual immorality with HIV which often leads to HIV positive individuals being labelled as "untouchables". Consequently, women are reluctant in actively discussing and researching about HIV and its modes of transmission. To add to that, the lack of governmental funds and resources as well as the low prevalent literacy rate, all make it even more difficult for willing health care personnel to conduct large-scale, health awareness programs which could provide individuals with adequate counselling about HIV.

Regarding the sociodemographic factors which affected the observed knowledge and attitude: amongst the women who had full knowledge, those from a rural residence (3.8%) were greatly outnumbered by those from urban residences (96.2%). Widespread use of technology (cell phones, television, internet), a higher literacy rate and greater number of antenatal clinics in urban areas might explain our outcomes as these make information regarding health awareness campaigns, free HIV tests and PMTCT more accessible to the urban residents. A similar study conducted in urban African-Americans yielded low prevalent knowledge regarding HIV (average = 43.5% correct answers), interestingly mentioning younger age, homo/bisexuality and experience of sexual abuse in the earlier years as factors associated with comparatively higher levels of knowledge about HIV transmission in their sample population [16].

Furthermore, there was also a positive association between women who had full knowledge and those with higher education. By natural deduction, women with primary education or lesser might experience difficulty in reading newspapers, articles and brochures on MTCT or in understanding scientific terms which leads to them having inadequate or no information about vertical transmission. This concept of increasing education facilitating understanding has been backed by a Chinese study (2012), that displayed high school students as having understood the contents of awareness increasing educational materials regarding HIV faster and in more depth than their middle school going counterparts, since the former had some relevant knowledge from their classes and relevant curricula [17]. However, in a study carried out in Nigeria, both literate and illiterate populations were equally aware about MTCT which is reflective of governmental efforts to make health education accessible to all individuals [18].

Another major finding of this study was that only 49% of the pregnant women agreed that all women should be tested for HIV. This was notably lower than the 98.5% figure from Eastern Uganda [19]. Majority of the women (83%) in this study also stated that they would not invite their partners for HIV testing, the most common reason being possible anger or resentment by the partner. Most partners are unwilling to be tested because they view HIV tests as an allegation of sexual depravity, as opposed to a diagnostic tool which helps ensure a healthy life. A pleasant contradiction to this norm was portrayed by a study from Brazil (2017), where 57% of the interviewed male partners had attended HIV voluntary counseling and testing (VCT), had a general understanding of the value of HIV PMTCT and described open and communicative relationships with their significant other [20]. Encouragingly, a randomized control trial conducted in Kenya successfully implemented a solution to the unwillingness for HIV testing on the part of male partners, by giving out oral-fluid-based HIV self-test kits to participating females for secondary distribution to them. An overwhelming 90.8% of those in the self-testing group returned with completed tests, compared to the 51.7% of those who accepted invites for clinic based testing, as a control [21].

In addition to that, majority of the respondents (82.7%) who had full knowledge also stated that they expected their partners to have a

positive reaction towards a positive HIV result. Once again, this figure is supported by the study of Northwest Ethiopia, in which 71.2% of the knowledgeable women had the same opinion [15]. This shows that if partners have a positive attitude, women are more confident to explore taboo subjects such as HIV and prioritize their health over societal opinions. Another probable reason for the results might be that women who are well informed about MTCT and its prevention are more efficient in explaining to their partners the potential health risks which their child might encounter if she is HIV positive; this may lead to the partner becoming more understanding.

Surprisingly, majority of the women (84%) agreed to take care of a HIV positive family member. For a society with such a strong prejudice against HIV positive individuals, this progressive attitude might aid in eliminating the stigmatization of HIV. The reason behind this outcome may be the prevalence of extended family system in Karachi which leads to women becoming biased when it comes to their family members. Such familial interdependence and support contributing to individual well-being was also reported in a similar study from China that evaluated the psychological distress amongst patients of HIV and their family members [22]. Another possible reason could be the lack of awareness regarding the psychological distress imposed by the fears and myths regarding HIV transmission and contracting opportunistic infections, in families actively caring for a patient of HIV, as exhibited by a study from the USA [23].

Treatment programs targeting HIV have been initiated across Pakistan in the past, like the one in 2006 which involved treatment centers being set up in four large cities with an aim was to treat 8000 HIV positive individuals [24]. There is a dire need of similar projects to create awareness among women about the prevention of vertical transmission of HIV. Furthermore, media platforms such as newspapers, magazines, posters, social media and television should be utilized for campaigning about sexually transmitted diseases. Taxation on antiretroviral drugs should be reduced and free HIV tests should be conducted in hospitals and antenatal clinics, especially in rural areas. Additionally, HIV testing of couples prior to their marriage should be encouraged which has been done in countries like Africa via introducing couples' voluntary HIV counselling and testing (CVCT) together, as a cost effective preventive strategy [25]. This has resulted in substantial increases in safe sex in sub-Saharan Africa, especially when at least one partner was found to be HIV infected [26]. The government also needs to gain the cooperation of religious leaders to destigmatize HIV as majority of the citizens are Muslims and religion is an integral part of their lives. An encouraging finding regarding this was from a Nigerian study, where 85.7% of the participating religious leaders had good knowledge about routes of transmission and modes of prevention of HIV and 76.5% had used their position to educate congregations about its dangers [27]. Most essentially, primary education should be provided to everyone so that everyone is able to read about HIV, at the least.

Moreover, our data illustrated that breastfeeding emerged as the least known mode of MTCT. Thus, women should be particularly informed of the WHO guidelines which state that an HIV positive mother not taking ARV treatment should favour replacement feeding such as formula milk, if her socioeconomic conditions allow for it [28]. Moreover, safe delivery was the mode of PMTCT identified by the least number of respondents. Caesarean sections are another stigma in Karachi's society as people equate them to reproductive disorder. It should be realised that for an HIV positive mother, C-section is safer as it reduces the chances of transmission of HIV to the infant [18]. Lastly, early infant diagnosis should be carried out at 4 or 6 weeks after birth and testing at 18 months and/or when breastfeeding ends to ensure that the infant is not HIV positive [28].

There were several limitations to this study. The data was collected from just 350 pregnant females from the largest city of the country, hence the obtained results may not be representative of the national knowledge status at large. Our participants were not asked whether they had been educated or informed about HIV and its transmission as well as MTCT or PMTCT prior to the data collection which limited our ability to analyze the impact of any implemented awareness programs in the city. However, as the first study to be conducted in Karachi on this subject, our article serves as a means to bridge the knowledge gap between Karachi and other regions alongside highlighting some very essential findings regarding the prevalent knowledge, attitude and their predictors, within the sample population.

Conclusions

In summary, this study shows that majority of the pregnant women in Karachi are unaware of MTCT and its prevention. Furthermore, their attitude towards routine HIV testing is not incredibly positive. Thus, we see the need for collective efforts of the government, the relevant non-profit organizations and health professionals to destigmatize HIV and counsel the general population about its vertical transmission, as part of educational programs concerning sexual and reproductive health at large. Finally, this study serves as a model for further studies to be conducted on the theme in the country and amongst different sample populations – so as to evaluate and keep a record of the status and changes that occur in this knowledge and attitude in future.

Declaration of Competing Interest

Author declares that there is no conflict of interest.

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