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Original Research Article.

Knowledge and Awareness towards Mother to Child Infections among Married Women in Riyadh, Saudi Arabia

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ABSTRACT

Background: Infections occurring in antenatal period or during birth constitute an important public health problem leading to short-term or long-term child morbidity and mortality. A great majority of these infections are amenable to prevention through proper education, counseling and guidance.

Aim: We aimed to assess the knowledge of and awareness towards maternal infection that are transmissible from mother to child, among Saudi married women.

Materials & Methods: Present study was taken up as a descriptive cross sectional design among a representative sample of (N=477) married, Saudi women, conducted in Riyadh city. The data was collected through a self-administered, pre-tested, structured and closed ended questionnaire. The questionnaire had 5 sections focusing on 5 major pathogens that are incriminated as mother to child infection transmission, their routes and preventive methods.

Results: Among the study respondents highest knowledge was noted towards about HIV (71%), followed by Hepatitis B (62%), Toxoplasma gondii (54%), Hepatitis C virus (53.8%) and Rubella (53%). The pathogens that were lesser known among study participants included cytomegalovirus, parvo-virus B19, and chlamydia. The commonly known preventive methods found were, keeping away from cats for preventing Toxoplasmosis (71%), vaccination for preventing Rubella (71%).

Conclusion: We found varied knowledge and awareness towards the diseases transmissible from mother to child with disproportionate levels of awareness between individual diseases.

Key Word: Awareness, Mother to Child Transmission, Saudi Arabia, Cross Sectional Study.

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INTRODUCTION

Infections occurring in antenatal period or during birth constitute an important public health problem leading to short-term or long-term child morbidity and mortality.[1] The acronym TORCH was introduced around three decades ago to group the pathogens with ability to transmit from mother to child and manifesting during post-natal period with similar clinical features such as ocular damage, skin rash, hepatosplenomegaly, jaundice, anemia and many other features.[1,2] The acronym refers to a set of pathogens (T for Toxoplasmosis gondii, O for other infections, R for Rubella, C for Cytomegalovirus and H for Herpes simplex virus HSV1/HSV2). Other infections in TORCH include a growing number of pathogens such as (Syphilis, Varicella, human immunodeficiency virus (HIV), Parvovirus B19, Hepatitis (B, C, D, and E) and Enteroviruses. Subsequent newer agents were added as part of other infections including Q fever, Coxsackievirus, Lymphocytic Choriomeningitis virus, Tuberculosis, Malaria, Brucellosis[3,4], Chlamydia[5], Human T-lymphotropic virus[6], Group B Streptococcus[7], Listeria[8], Candida[9], Lyme disease[10], Gonorrhea[11], Ureaplasma urealyticum[12] and Human Papillomavirus.[13] The placenta functions as a natural barrier to prevent the crossing of pathogens from maternal to fetal blood, however, some micro-organism have the ability to cross it and causing complications or

even fetal death.[14,15] Fortunately the fetus develops passive immunity to various antigens through passing of maternal IgG to the fetus.[2,16]

Primary infection and reactivation of TORCH can occur during pregnancy. Maternal illness due to TORCH infections is mild in most cases, on the other hand it may cause fetal abortion, fetal death, sever congenital neonatal anomalies, intrauterine growth retardation (IUGR), symptomatic or asymptomatic infection with childhood or adulthood morbidity.[17] Globally, incidence of congenital infection in infancy is around 0.5%-2.5%.[1] Various studies have described the prevalence of these infections across Saudi Arabia.[18-21]

Although vaccination before conception is the most effective measure to prevent TORCH infections, no current vaccination is available against certain pathogens such as Toxoplasma gondii, Cytomegalovirus and Parvovirus B19 pathogens. Thus, in effort to reduce the incidence of TORCH infections, it is important to raise awareness and knowledge about preventive methods among childbearing women.[22] Internationally, studies have been conducted in order to assess the awareness about these infections[23-28], however, these focused on awareness regarding HIV infection. Almost all of them reported lack of awareness and knowledge about HIV as one of TORCH infections. In Saudi Arabia, no previous studies have been conducted to assess the awareness and knowledge of women about TORCH infections, which prompted the uptake of present study. We aimed to estimate the knowledge and awareness 13 TORCH infections among married Saudi women in Riyadh, Saudi Arabia. The study also aimed to assess knowledge of transmission modes and methods of prevention against Toxoplasma gondii, Rubella, Cytomegalovirus, Herpes simplex virus 1-2 and Parvovirus B19. These pathogens have been specifically chosen considering the serious impact of these pathogen on infant's mortality and morbidity.[29,30]

MATERIALS & METHODS

Present study was taken up as a community based cross sectional design, conducted among married Saudi women, living in Riyadh.

Sample Size Calculation

As no previous studies were available on the knowledge/awareness towards TORCH infections, we considered the proportion prevalence to be 50%, with 95% confidence level and 5% precision, the minimum sample size required was estimated to be 385. Taking 10% non-response rate, the final sample calculated to be 477.

Sampling Technique and Data Collection

A purposive sampling technique was followed to collect the quantitative data through an online survey (via survey-monkey). A link leading to the online questionnaire was generated and distributed through emails and social media. The online questionnaire included an electronic consent.

Data Collection tool

A pre-tested, closed ended, structured questionnaire, in Arabic language, was used to collect the data which was drafted based on the literature review and expert opinions. The questionnaire contained sections including socio-demographic information, awareness of 13 diseases included in TORCH group, awareness of transmission routes and prevention methods towards (Toxoplasmosis, Parvovirus B19, Rubella, Cytomegalovirus, Herpes simplex 1-2). The knowledge/awareness responses were yes, no and don't know.

Data management

Data entry and analysis done by using the SPSS computer statistical software package (IBM statistic version 21.0). Descriptive statistics is presented as frequency and percentages. For finding out the association between factors, the responses "no" and "don't know" were combined together and were compared with positive ("yes") responses. Chi square was used to find out the association between factors, for categorical variables. Statistical significance was considered to be $p<0.05$.

Ethical Consideration

The participants were assured about the confidentiality of the responses. Moreover, they were provided with the health education material regarding prevention of these infections. The study was conducted after obtaining formal ethical approval from the research ethics committee in King Khalid University Hospital (project number E-15-1544).

Table 1: Knowledge/awareness among study participants about diseases that can infect fetus during pregnancy or at labor (n=477)

Disease	Yes		No		Don't know	
	n	%	n	%	n	%
Toxoplasmosis	258	54.09%	54	11.32%	165	34.59%
Rubella	253	53.04%	78	16.35%	146	30.61%
Chlamydia	112	23.48%	40	8.39%	325	68.13%
Herpes Simplex	178	37.32%	76	15.93%	223	46.75%
Syphilis	218	45.70%	65	13.63%	194	40.67%
Hepatitis B	296	62.05%	76	15.93%	105	22.01%
Varicella	190	39.83%	180	37.74%	107	22.43%
Cytomegalovirus	69	14.47%	38	7.97%	370	77.57%
Hepatitis C	257	53.88%	64	13.42%	156	32.70%
Parvovirus B19	92	19.29%	40	8.39%	345	72.33%
HIV /AIDS	339	71.07%	57	11.95%	81	16.98%
Measles	225	47.17%	118	24.74%	134	28.09%
Human T cell Leukemia virus 1	108	22.64%	59	12.37%	310	64.99%

Table 2: Knowledge/awareness among study participants about modes of transmission of certain diseases having mother to child transmission (n=477)

Disease	Modes of transmission	Knowledge/Awareness response					
		Yes		No		Don't know	
		n	%	n	%	n	%
Toxoplasmosis	Handling Cats' feces	241	51.61%	65	13.92%	161	34.48%
	Eating undercooked meat	150	33.11%	148	32.67%	155	34.22%
	Breast Milk	182	40.63%	104	23.21%	162	36.16%
	Birth Canal	133	30.09%	127	28.73%	182	41.18%
Parvovirus B19	Exposure to air respiratory droplets	219	47.10%	44	9.46%	202	43.44%
	Breast Milk	155	34.83%	77	17.30%	213	47.87%
	Birth Canal	100	22.99%	87	17.93%	257	59.8%
Rubella	Exposure to air respiratory droplets	208	45.22%	97	21.9%	155	33.70%
	Breast Milk	172	38.39%	114	25.45%	162	36.16%
	Birth Canal	130	29.41%	108	24.43%	104	46.15%
Cytomegalovirus	Handling infected urine and saliva	156	33.94%	43	9.35%	261	56.74%
	Mother exposed to infected semen	183	40.22%	38	8.35%	234	51.43%
	Breast Milk	105	23.39%	71	15.81%	273	60.80%
	Birth Canal	94	21.32%	59	13.38%	288	65.31%
Herpes simplex	Mother exposed to infected semen	246	53.36%	45	9.76%	170	36.88%
	Mouth kissing	212	46.80%	89	19.65%	152	33.55%
	Breast milk	124	27.80%	117	26.23%	205	45.96%
	Birth Canal	162	35.68%	71	15.64%	221	48.68%

Table 3: Knowledge/awareness among study participants about methods of prevention of certain diseases having mother to child transmission

NAME OF DISEASE/METHODS OF PREVENTION	KNOWLEDGE/AWARENESS RESPONSE					
	Yes		No		Don't know	
	n	%	n	%	n	%
TOXOPLASMOSIS						
Cook meat to a safe temperature	266	55.77%	94	19.71%	117	24.35%
Wear gloves during any contact with sand	281	58.91%	103	21.59%	93	19.50%
Avoid trips to Europe during pregnancy	41	8.60%	287	60.17%	149	31.24%
Keep away from cats	341	71.49%	53	11.11%	83	17.40%
PARVOVIRUS B19						
Wear a mask	281	58.91%	26	5.45%	170	35.64%
Keep away from crowded places	291	61.01%	35	7.34%	151	31.66%
Keep away from people with fever or rash	284	59.54%	40	8.39%	153	32.08%
Wash hands and gargle	306	64.15%	27	5.66%	144	30.19%
RUBELLA						
Wear a mask	260	54.51%	82	17.19%	135	28.30%
Keep away from crowded places	307	63.73%	60	12.58%	113	23.69%
Keep away from people with fever or rash	326	68.34%	44	9.22%	107	22.43%
Wash hands and gargle	289	60.59%	63	13.21%	125	26.21%
Vaccination before pregnancy	339	71.07%	22	4.61%	116	24.32%
CYTOMEGALOVIRUS						
Wash hands after diaper changing	269	56.39%	31	6.50%	177	37.11%
Avoid kissing a child	152	31.87%	115	24.11%	210	44.03%
Do not share food, drinks, or eating utensils used by children	198	41.51%	75	15.72%	204	42.77%
Avoid taking care of children under 2 & half years old (if working in a day-care center)	141	29.56%	107	22.43%	229	48.01%
Use a condom during sexual intercourse	183	38.36%	54	11.32%	240	50.31%
HERPES SIMPLEX						
Wash hands and gargle	281	58.91%	60	12.58%	136	28.51%
Use a condom during sexual intercourse	279	58.49%	32	6.71%	166	34.80%
Avoid kissing mouth	292	61.22%	33	6.92%	152	31.87%

RESULTS

A total of 477 married Saudi women were included and analyzed. As for the socio-demographic data of our study respondents; the highest proportion (46.54%) was noted from (25 to 34) years age group, followed by 35-44 years age group (27.46%), 16 to 24 years (17.61%) and more than 45 years (8.39%). Around half of the study respondents (48.6%) had 1-3 children, about 30.4% had more than or equal to 4 children while about 20% were without any child. Highest proportion of participants (56.7%) were educated up-to graduation while about 45.5% were working women. About 54.5% of the study respondents had monthly income more than 10,000 Saudi Arabian Riyal (SAR).

Table 1 is showing the knowledge/awareness among study participants about diseases that can infect fetus during pregnancy or at labor. As shown in table, highest proportion (71%) of the study respondents were aware about HIV followed by Hepatitis B (62%), Toxoplasmosis (54%), Hepatitis C (53%) and Rubella (53%). The diseases which were less commonly known by the respondents included Cytomegalovirus (14%), Parvovirus B19 (19%), Human T cell Leukemia virus 1 (22%), Chlamydia (23%), Herpes Simplex (37%). The knowledge/awareness among study participants about modes of transmission of certain diseases having mother to child transmission is shown in table 2. The highest proportion (53%) were aware that herpes simplex can transmit through exposure to infected semen, followed by the awareness of transmission of toxoplasmosis through handling Cats' feces (51%). Almost similar proportion of respondents were aware about transmission of parvovirus B19 through exposure to air respiratory droplets (47%), transmission of herpes simplex through mouth kissing (46%) and rubella through exposure to air respiratory droplets (45%). Table 3 is showing the knowledge about the methods of prevention of some of these diseases. As shown in table, highest proportion were aware about prevention of toxoplasmosis through keeping away from cats (71%) and prevention of Rubella through vaccination (71%).

DISCUSSION

Present study has attempted to assess awareness and knowledge of 13 pathogens responsible of mother to child infections, among married females in Riyadh Saudi Arabia. Most of the females participated in our study were educated and employed. We found that human immunodeficiency virus (HIV) to be the highest known pathogen in our study, whereby about three fourth of participants were aware about it. The pathogens that were known to about slightly more than half of the participants included Hepatitis B, Toxoplasma gondii, Hepatitis C virus and Rubella. The pathogens that were lesser known among study participants included cytomegalovirus, parvo-virus B19, HTLV-1 and chlamydia. These findings are corroborated by similar study conducted in Japan in term of high awareness of HIV and lowest awareness towards cytomegalovirus.[23]

The percentage of awareness of Toxoplasma gondii is our study is similar (54% vs 58%) to that reported in Japan.[23] The common Arabic name of Toxoplasmosis is “disease of cats” which explains the high-level knowledge about any transmission routes related to cats. The knowledge of preventive methods of Toxoplasmosis might also be influenced by the Arabic name of Toxoplasmosis as 71.49% of participants reported “stay away from cats” as a preventive method against Toxoplasmosis compared to only 25% in previously quoted study. However, about one third of study participants had incorrect knowledge of transmission through breast milk and birth canal, which is much higher than that reported in the same study.[23]

Incidence of mother-to-child transmissible infection in Saudi Arabia is not well established except some sero-prevalence studies. For instance, a study conducted in Makkah has reported the prevalence of Toxoplasmosis IgG antibodies to be 35.6% and Rubella to be 93.3%, among a sample of Saudi women attending Maternity and Children’s Hospital.[24] About half of the respondents were aware that Rubella can be transmitted from to child, while about slightly less than three-fourth knew that it is preventable through vaccination. The awareness might be contributed to the lunch of the MMR campaign to eliminate Rubella infection in 1998.[25] Many of respondents had incorrect knowledge of transmission through breast milk and birth canal.

CONCLUSION

We found varied knowledge and awareness towards the diseases transmissible from mother to child with disproportionate levels of awareness between individual diseases. Efforts should be taken to raise awareness about the lesser-known disease such as cytomegalovirus, parvo-virus B19, HTLV-1 and chlamydia. These should be incorporated into the health education and counselling programs directed towards females seeking antenatal care.

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