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Original Research Article

A study on risk factors of abortion in a tertiary care hospital in Thrissur District, Kerala

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ABSTRACT

Background: Abortion is the spontaneous termination of pregnancy before 22 weeks or if the foetus weighs less than 500 gm. Spontaneous abortions may occur as a result of genetic factors, infectious agents, uterine abnormalities and other maternal factors. The present study was undertaken to study risk factors of abortion in a tertiary care hospital in Thrissur district.

Methods: A hospital based case control study was done during a five month period. The sample size was calculated using the formulae $[(Z\alpha + Z\beta)^2 \times 2 \times PQ]/d^2$. Total 40 mothers admitted with abortion were taken as cases and 40 mothers admitted with conditions other than abortion of the same trimester were taken as controls. Data was collected with the help of an interviewer administered semi structured questionnaire.

Results: Out of total 80 mothers, 46.2% of them belongs to 21-25 age group and more than half, 66.2% of the mothers were primi gravida. There was a statistically significant association between mother's occupation and occurrence of abortion. The abortion rates were higher among overweight mothers, but this difference was not statistically significant. Among obstetric determinants, previous history of abortion, primi gravida mothers, and history of travel had higher risk for abortion with odds ratio 3.5, 2.8, and 2.72 respectively.

Conclusions: Previous history of abortion and history of travel contributes to higher risk of abortion. Interventions could be targeted more on women with prevalent risk factors to increase health profits.

Keywords: Abortion, Case control study, Risk factors

INTRODUCTION

Abortion is the spontaneous termination of pregnancy before 22 weeks or if the foetus weighs less than 500 gm (WHO). About 10-20% of all clinically recognized pregnancies end up in abortion. There are maternal and foetal factors responsible for abortion. More than 80% of spontaneous abortions occur within the first 12 weeks of gestation. The maternal factors mainly include infections like rubella, herpes simplex, cytomegalovirus infections and systemic diseases like diabetes mellitus, hypothyroidism. It also includes congenital malformations of the uterus, cervical impotence and

autoimmune disorders. The signs and symptoms of abortion are amenorrhoea, abdominal pain, bleeding per vaginum, dilatation of cervix due to uterine contractions, expulsion of a part of or the entire ovum. Spontaneous abortion is a new issue in terms of its social and economic impact. Today majority of women decide to conceive in their thirties or forties, since they are carrier oriented during the age of maximum fecundity. After the age of 30-35 years, potential fertility declines and the rate of spontaneous abortion increases.¹ Stress, pollutants, smoking etc. also increase the incidence of abortion. Some maternal infections during the early gestational age can result in foetal loss or malformations. The foetus is

infected predominantly by viral but also by bacterial and protozoal pathogens. The most consistently reported risk factors for abortion are high maternal age and previous history of spontaneous abortion.² The prevalence of abortion is increasing in Kerala. The incidence of spontaneous abortion in both rural and urban areas of Kerala stands at 15.6%, higher than the other states. Kerala, however is also a state where incidence of induced abortion advised by medical persons is high.³

The category of spontaneous abortion includes threatened, inevitable, complete and missed abortions. In threatened abortion, the patient presents with amenorrhoea followed by vaginal bleeding, which is usually painless, but may be accompanied by mild abdominal cramps or back ache. In inevitable abortion, the process of abortion has progressed to an extent that expulsion of the products of conception is inevitable. There will be a history of amenorrhoea followed by vaginal bleeding which maybe profuse and associated with pain. In complete abortion the products of conception would have been completely expelled out. In missed abortion, there is intra uterine death of the embryo or non-viable foetus which is then passively retained in the uterus.⁴

The present research was aimed at assessing the various maternal risk factors of abortion in a tertiary healthcare hospital. This study is relevant in the present scenario of increasing rate of abortions. On account of limited number of studies done on maternal risk factors of abortion in Kerala, this study can highlight the most prevalent risk factors of abortion in pregnant mothers and appropriate measures to be taken to increase health benefits.

METHODS

A hospital based case control study was done in Amala Institute of Medical Sciences, Thrissur, Kerala. The study was done taking pregnant mothers admitted with abortion as cases and pregnant mothers of the same trimester admitted for conditions other than abortion as controls. The study period was from August 2019 to December 2019. The sample size was calculated taking difference in proportion of TORCH infection among pregnant mothers with abortion and without abortion from previous study done from Malabar region of Kerala.⁵ Proportion of TORCH infection among mothers with abortion as- 50.7% and proportion of TORCH infection among mothers without abortion as 20%, using the formulae $[(Z\alpha + Z\beta)^2 \times 2 \times PQ] / d^2$, taking $p_1 = 50.7\%$, $p_2 = 20\%$, $P = (p_1 + p_2) / 2 = 35.35$, $Q = 100 - P$, $d = (p_1 - p_2) = 30.7$, $35834.712 / 942.49 = 38$. Total sample size was 80. The consecutive sampling technique was used and all mothers who had given consent and admitted in the obstetrics ward with and without abortion were included. Those pregnant mothers with co-morbidities like heart disease, malignancy, auto immune diseases, renal diseases and liver diseases were excluded. Data was

collected using a semi structured interviewer administrated questionnaire. The questionnaire was developed by subject experts and pilot study was done using 10% of sample size to validate it. The questionnaire contained demographic and maternal risk factors of abortion.

The data collected was entered in MS excel and appropriate statistical methods like mean, proportion, chi square and odds ratio were used for analysis. The statistical analysis was done using SPSS version 23 software.

RESULTS

A total of 80 pregnant mothers were included in the study, out of which 40 were admitted for abortion and remaining 40 were admitted for conditions other than abortion. The mean age of study population was 25.88 ± 3.43 with minimum age of 21 and maximum age of 38. 46.2% of mothers belong to 21-25 years of age group. In this study, majority (51.2%) had completed their degree education, 12.5% had post graduate degree and 16.2% studied up to high school. Out of the 80 people surveyed, 38 (47.5%) of them were homemakers, 14 (17.5%) were students and 17 (21.2%) worked as professionals.

Among the pregnant mothers surveyed, majority of mothers were primigravida (66.2%) while 33.8% were multi gravida. 55% of them had a previous history of abortion. Moreover, there were 31.2% of them with positive family history of abortion. Majority of the participants (83.8%) did not use any contraceptives prior. Out of 80 mothers, 19 of them (23.8%) had a history of travel outside the residing district during first trimester. The pre- pregnant BMI was assessed and it was found that out of total 80 mothers, 38 (47.5%) were found to be obese, 20 (25%) were found to be overweight, another 20 (25%) were found to have normal weight and 2 (2.5%) were found to be underweight during the pre-pregnancy period. Figure 1 shows distribution of study population based on pre-pregnant BMI.

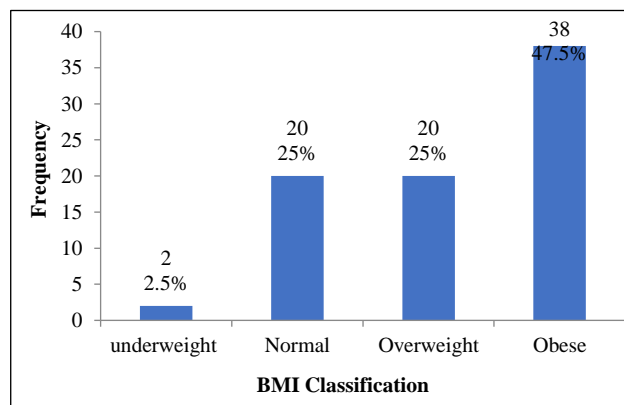


Figure 1: Distribution of study population based on pre-pregnant BMI.

The socio-demographic determinants of mothers with abortion were compared with mothers without abortion. It was found that among the 37 mothers in the age group of 21-25 years, 18 (48.6%) had abortion and among the 34 mothers in the age group of 26-30, 18 (52.9%) had abortion. But this was not statistically significant (p value- 0.88). Out of 37 mothers belonging to the Hindu religion, 22 (59.4%) had undergone abortion, out of 29 mothers belonging to Christian religion, 10 (34.4%) had undergone abortion, and out of 13 Muslim mothers, 8 (61.5%) had undergone abortion. This did not have any statistical significance (p value- 0.11). The incidence of abortion was more in mothers in overweight and obese

categories but was not statistically significant. It was found that among the 19 mothers working as professionals, 13 (68.4%) had undergone abortion. This could potentially be due to work related stress associated with the job. This inference was statistically significant (p value- 0.04). Being a homemaker, the occurrence of abortion stands at 50 %. Out of the 14 mothers who were still students, 5 (35.7%) had undergone abortion and among the 11 mothers doing skilled work, 3 (27.7%) had undergone abortion. The comparison of socio demographic factors of mothers with and without abortion are given in Table 1.

Table 1: Comparison of socio-demographic factors among mothers with and without abortion.

Parameter	Classification	Cases Mothers with abortion N (%)	Controls Mothers without abortion N (%)	Total	Statistical Significance
Age in years	21-25	18 (48.6)	19 (51.4)	37	Fischer's exact value -0.25 P value -0.88
	26-30	18 (52.9)	16 (47.1)	34	
	>30	4 (44.4)	5 (55.6)	9	
Religion	Hindu	22 (59.4)	15 (40.6)	37	Chi- square value- 4.43 P value- 0.11
	Christian	10 (34.4)	19 (65.6)	29	
	Muslim	8 (57.1)	6 (42.8)	14	
Occupational status	Home maker	19 (50)	19 (50)	38	Chi-square value- 8.18 P value- 0.04
	Student	5 (35.7)	9 (64.3)	14	
	Skilled worker	3 (27.7)	8 (72.7)	11	
	Professional	13 (68.4)	4 (21.6)	19	
SES	Upper middle	9 (50)	9 (50)	18	Fischer's Exact Value- 4.31 P value- 0.11
	Middle class	31 (52.5)	28 (47.4)	59	
	Lower Middle	0	3 (100)	3	
Pre-pregnant BMI	Under weight	1 (50)	1 (50)	2	Fischer's exact value- 2.77 P value- 0.42
	Normal	10 (50)	10 (50)	20	
	Over weight	13 (65)	7 (25)	20	
	Obese	16 (42.1)	22 (57.9)	38	

Table 2: Comparison of obstetric risk factors among mothers with and without abortion.

Parameter	Classification	Cases Mothers with abortion N (%)	Controls Mothers without abortion N (%)	Total	Statistical significance	Odds ratio (confidence interval)
Gravidity	Primi gravida	31 (58.4)	22 (41.6)	53	Chi-square value- 4.52 P value- 0.03	2.82 (1.06-7.42)
	Multigravida	9 (33.3)	18 (66.7)	27		
Previous h/o of abortion	Yes	28 (63.6)	16 (36.4)	44	Chi-square value- 7.27 P value- 0.007	3.5 (1.38-8.83)
	No	12 (33.3)	24 (66.7)	36		
Family h/o of abortion	Yes	12 (48)	13 (52)	25	Chi-square value- 0.05 P value- 0.809	0.79 (0.31-2.03)
	No	28 (50.9)	27 (49.1)	55		
Use of contraception	Yes	6 (46.1)	7 (53.9)	13	Chi-square value- 0.09 P value- 0.76	0.83 (0.25-2.73)
	No	34 (50.7)	33 (49.3)	67		
H/o of travel	Yes	13 (68.4)	6 (31.6)	19	Chi-square value- 3.38 P value- 0.06	2.72 (0.91-8.12)
	No	27 (44.2)	34 (55.8)	61		

Out of 53 primigravida mothers surveyed, 31(58.4%) had undergone abortion, and out of the 27 multi gravida mothers only 9 (33.3%) had undergone abortion. This was found to be statistically significant (p value- 0.03). There was 2.82 times more risk for a primigravida mother to attain abortion as compared to that of a multi gravida mother (odds ratio- 2.82). There was also statistically significant association between previous history of abortion and current abortion (p value- 0.007), as 28 out of the 44 mothers with previous history of abortion had presently undergone abortion. There was 3.5 times more risk of abortion for a mother with previous history of abortion. In addition, there was 2.72 times more risk of abortion in mothers with positive history of travel but was not statistically significant. There was also no statistically significant association with family history of abortion or prior use of contraceptives. The comparison of obstetrics risk factors are given in Table 2.

DISCUSSION

The results of present study was compared with a study by Osborn et al which showed that majority of mothers with abortion were in the category of 25-29 years of age and also showed a trend of increasing risk of abortion with advancing age.⁶ Our study also shows maximum number of abortions in mothers in the age group of 26-30. But a similar trend of increasing risk of abortion with age is not statistically significant. The study also showed that the risk of abortion increased with increase in gravidity score. In contrast, our study reveals that a primigravida mother is at greater risk (58.4%) than a multi gravida mother. A study done on Work related physical exertion and spontaneous abortion, by Banerjee et al showed that the risk of abortion is greater in women who are professional workers than homemakers.⁷ Our study also shows there is an increased risk of abortion in being a professional worker. Similar result was also obtained in a study by Lee et al.⁸ Another study done by Mukherjee et al observed a higher incidence of abortion when there is a previous history of abortion.⁹ Our study also shows that mothers with previous history of abortion have an increased risk of subsequent abortion. A study by Coste et al also has similar observation.¹⁰ The present study also shows an increased incidence of abortion in those mothers who travelled frequently but there is no statistical significance. However, there is no mention of travel history in any other studies. A study done by Helgstrand et al highlighted the association of pre pregnant BMI and abortion, showing an increased risk of abortion for underweight and overweight mothers.¹¹ Our study shows an increased incidence of abortion for overweight mothers but not of any statistical significance. The present study could not find any association of abortion with family history of abortion, educational status of mother or history of contraceptive usage. The most significant risk factors are found to be gravidity index, previous history of abortion and occupational status of mother.

Limitations to the study were that there were limited publications on risk factors of abortion, done as a hospital based study from India.

CONCLUSION

From the study, the risk factors of abortion in pregnant mothers admitted with abortion were assessed and compared with that of pregnant mothers admitted for conditions other than abortion. More than half of the mothers admitted with abortion were primi gravida. Previous history of abortion and history of travel can contribute to abortion. In addition, incidence of abortion was found to be more in professional workers than homemakers. The rate of abortion is higher among overweight and obese mothers but it was not found to be statistically significant.

The potential risk factors of abortion should be analysed and made aware to the pregnant mothers. Advice should be given to pregnant mothers regarding importance of frequent antenatal check-ups. Future studies will have to be done to obtain more accurate results about association of history of travel in pregnancy and abortion and also association of maternal obesity and abortion.

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