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Risk Factors of Spontaneous Second Trimester Abortion- A Case Control Study

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Abstract
Pregnancy is a period of wonderful time of anticipation but when it ends in spontaneous second trimester abortion, it can be an intensely sad and frightening experience to the expectant parents.
Objective[s]:*1.Early identification of high risk pregnancy patients.*
2. To determine the risk factors associated with spontaneous second trimester abortion.
Materials and Methods: *This is a case control study conducted in Sree Avittom Thirunal Hospital Trivandrum over a period of 1year.study group with all cases of spontaneous second trimester abortion admitted in hospital and control with registered antenatal patients who have completed 24 weeks of pregnancy..During the study period 156 cases in study group compared with 156 control group.*
Results: *In the present study women with positive past medical history had 2.5 times increased risk of second trimester abortion. Women with previous pregnancy loss had 3 times increased risk and history of cervical incompetence had 7 times increased risk when compared to control group.*
Conclusion: *This study suggest that women with spontaneous second trimester abortion should be informed of their pregnancy expectations and outcome. Improved Obstetrics care can provide successful pregnancy for the great majority of these high risk women. Appropriate interventions can prevent some of antepartum complications.*
Keywords: *Risk Factor, Second Trimester Abortion.*

Introduction

Spontaneous second trimester abortion is the loss of intrauterine pregnancy between 13 and 24 weeks of gestation [RCOG]. According to WHO, miscarriage is the expulsion of fetus or embryo weighing less than 500gm or gestation limit less than 22 weeks of pregnancy.

According to Clifford et al[1] the term miscarriage is used for all losses occurring upto 24 weeks of gestation.]

10 to 20 % of all clinical pregnancies ends in miscarriage, of which 15-20% occur in second trimester[2].

Evaluation of spontaneous second trimester abortion

Various socio-demographic as well as obstetrics factors are associated with late miscarriage. Causes can be

1. **Infections**
   Bacterial vaginosis, asymptomatic bactiurea, chlamydia infection, rubella, group B streptococci, parvo virus, toxoplasmosis, and mycoplasma homis
2. **Uterine anatomic abnormalities**
   - Cervical incompetence

- Mullarian fusion defects Bicornuate uterus, septate uterus
- Uterine synechiae
- Uterine fibroid

3. **Abnormal placentation**
   Low lying placenta
4. **Chlorioamniotic separations**
5. **Immunological abnormalities**
   APLA syndrome
6. **Maternal medical illness**
   DM, Hypertension, Renal disease, Bronchial Asthma, Cardiovascular diseases.
7. **Environmental factor**
   Age, parity, social economics and educational status
8. **Unknown etiology**

Diagnosis

History and physical examination is important in diagnosis. The process of expulsion is similar to a mini labour. The fetus is expelled first followed by expulsion of placenta after varying interval. The fetus with the placenta and the membranes should be carefully examined.

Evaluation

To test for every possible cause of abortion is not cost effective. Therefore using clinical and pathological finding to guide the investigation after delivery is important,

Chromosomal analysis should be considered in cases of recurrent pregnancy loss, culture of specimen from placenta and fetus are indicated if intra uterine infection is suspected. Other tests includes complete blood count, diabetes testing including HbA1c,VDRL,Thyroid function test, Expensive test like lupus anticoagulant and anti-cardio lipin antibody testing, ANA, Screening for infections like CMV Rubella, Toxoplasmosis if indicated.

Management of future pregnancy

1. Preconception counselling is most important,
2. Early antenatal registration and regular care
3. Early detection of obstetric complication and timely intervention

Materials and Methods

This was a case control study conducted in Sree Avittom Thirunal Hospital, Trivandrum over a period of one year. Study group include those patient admitted in SAT Hospital during the period with spontaneous abortion in second trimester. Control group include those women who registered in antenatal op and has completed 24 weeks of pregnancy

Inclusion criteria

All patients with spontaneous second trimester admitted in SAT

Exclusion criteria

- Patients with second trimester induced abortion
- Patients with early pregnancy loss up to 12 weeks
- Patients with features of threatened abortion

Methodology

- The patients satisfying the data were identified from the antenatal op and from ward
- A detail history taken regarding socio demographic factors, previous history of abortion, treatment for infertility, antenatal care and presence of medical complication like hypertension, diabetes. Routine investigation report and ultra sound findings were recorded.
- The data were entered into master chart and statistically analysed using chi square test keeping the p value of <0.05 as significant. All statistical calculations were done using computer package.

Observations and Results

During the study period 156 cases with second trimester spontaneous abortion were taken as study group. 156 cases with pregnancy more than 24 weeks as control group.

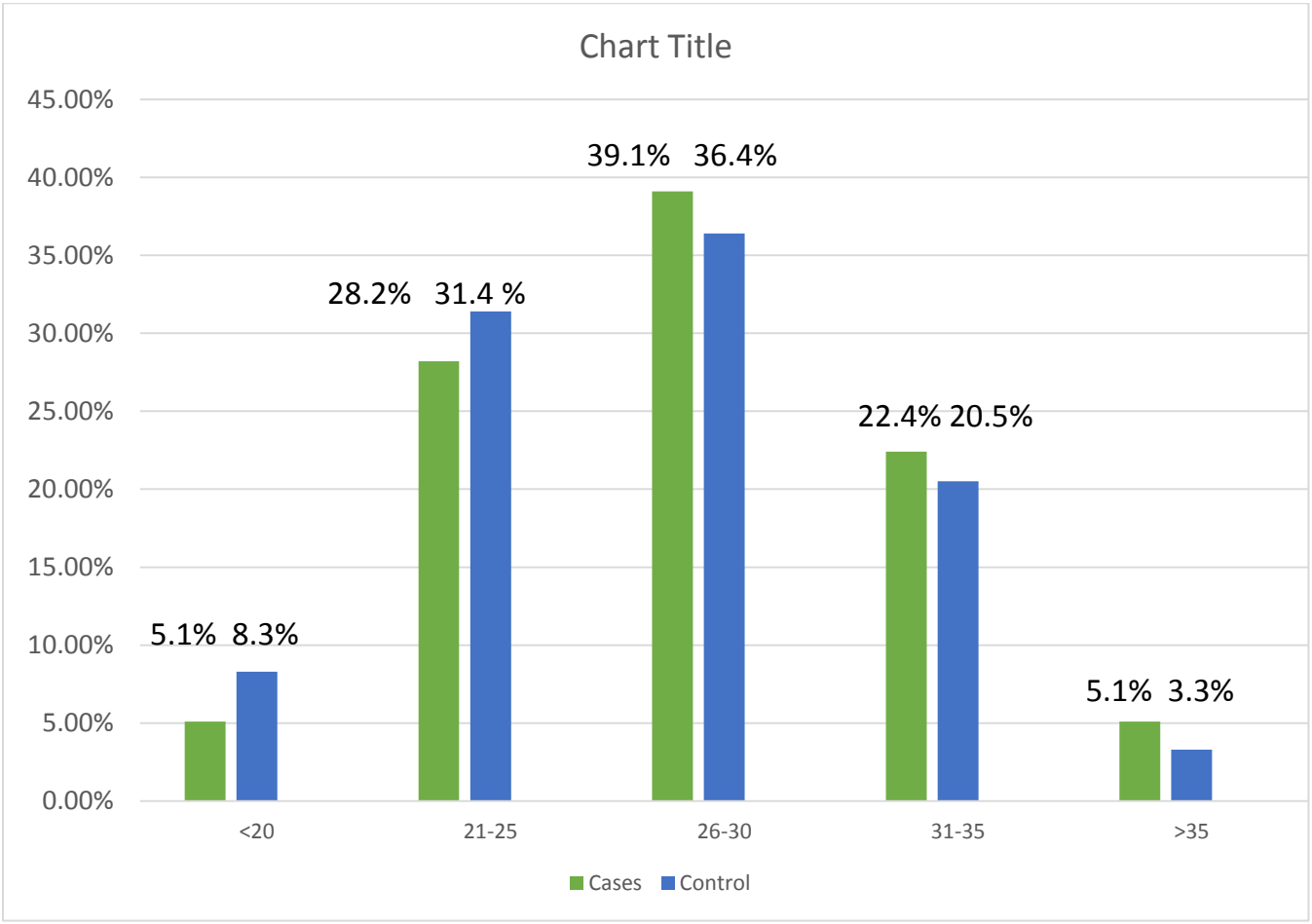
1. Socio demographic factors

Table 1: Distribution according to the age of the patient

Age	Cases		Control	
<20	8	5.1%	13	8.3%
21-25	44	28.2 %	49	31.4%
26-30	61	39.1%	57	36.4%
31-35	35	22.4 %	32	20.5%
>35	8	5.1 %	5	3.3%
Total	156	100%	156	100%

$X^2=0.605$ $p=0.431$

Women in the case group were more in the higher age group and the difference was not statistically significant. it may be due to the small sample size.



Table–2: Distribution according to the socio-economic status

	Cases		*Control*	
Low	128	82.05%	119	76.2%
Middle	26	16.6%	35	22.4%
High	2	1.3%	2	1.3%
Total	156	100%	156	100%

$X^2=1.656$ p=0.457

Low socio-economic group were more on the study group but the observed difference was not statically significant, due to the small sample size.

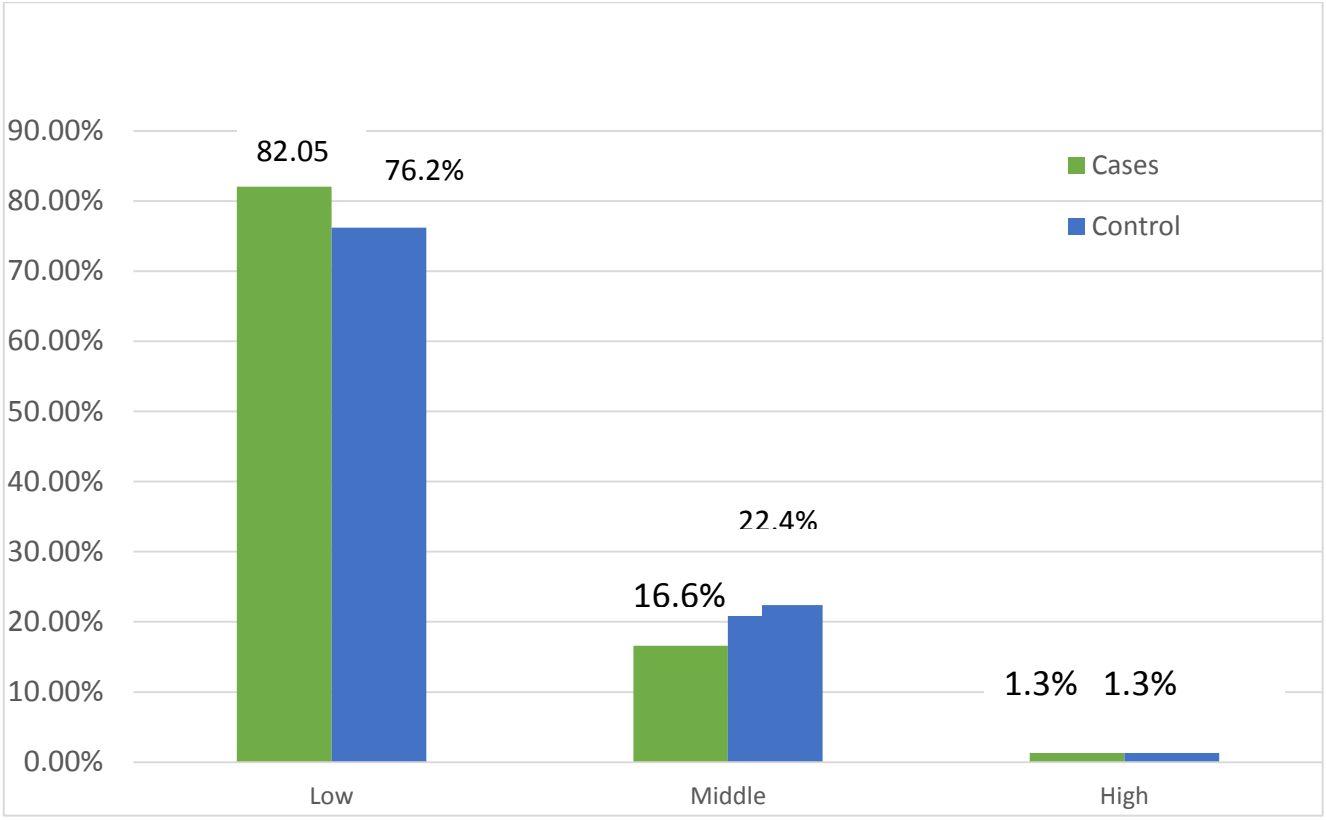
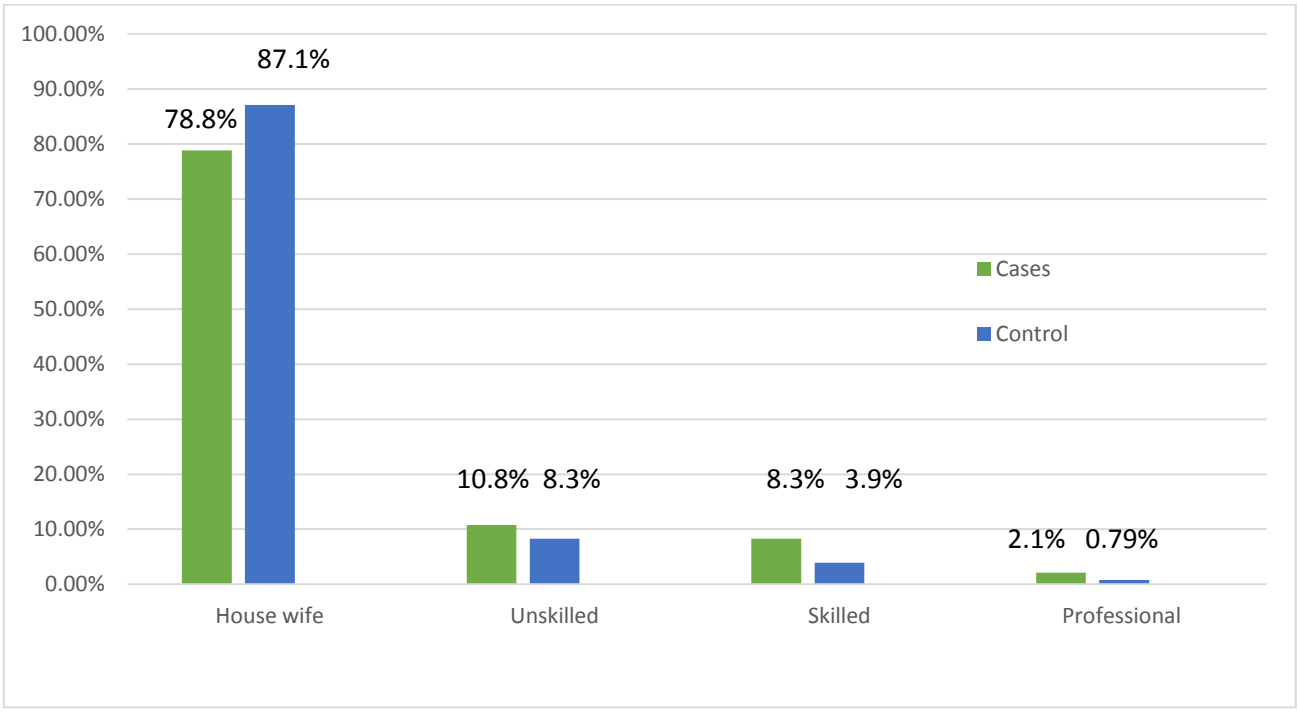


Table 3: Distribution according to occupational status

	Cases		Control	
House Wife	123	78.8%	136	87.1%
Unskilled	17	10.8%	13	8.3%
Skilled	13	8.3%	6	3.9%
Professional	3	2.1%	1	0.79%

$x^2 = 4.765$ $p = 0.190$

The observed difference was not statically significant but the skilled and the unskilled workers were more on the study group. Increased abortion in them may be due to the strenuous job without rest.



2. Past History

Table-4: Distribution according to past medical history

	Cases		*Control*	
Positive history	***72***	***51.9%***	***39***	***27.5%***
Negative history	***84***	***49.1%***	***117***	***72.5%***
Total	***156***	***100%***	***156***	***100%***

X^2=15.229 ***p=0.007***
OR=2.571 ***CI=1.591-4.156***

It is really remarkable to note that out of 156 cases included in in the study group 51.9% had positive past medical history. At the same time the control group only 27.5% had positive past medical history. The observed result was statistically significant and shows 2.5 times increased risk.

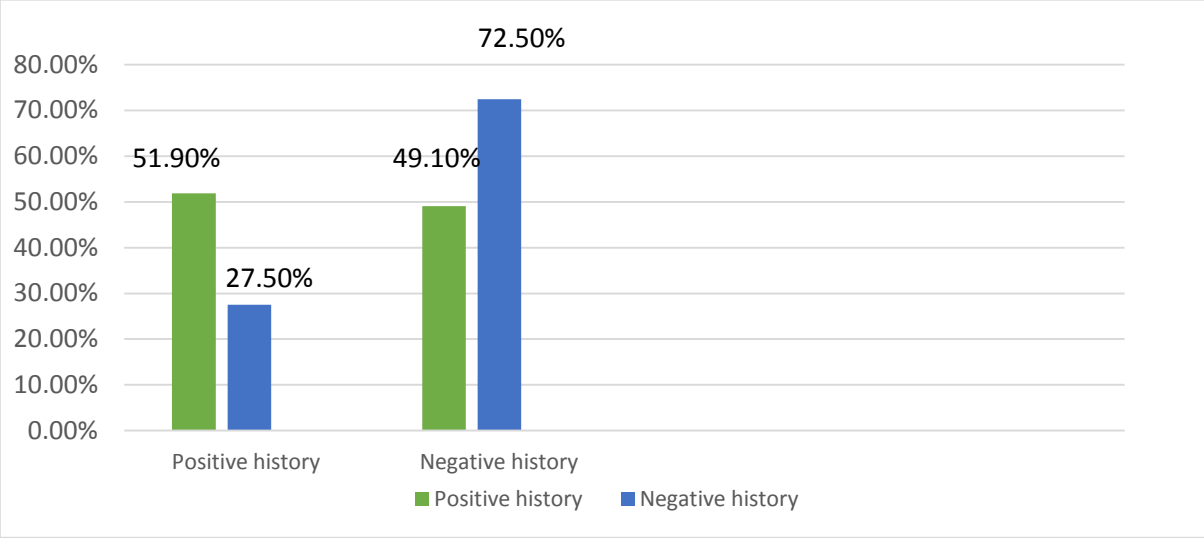


Table-5: Distribution according to previous obstetric complications

	cases		control	
Present	76	48.7%	43	27.6%
Absent	79	51.3%	113	72.5%

X^2=15.169 p=0.000
OR=2.528 CI=1.577-4.052

Out of 156 cases 48.7% had previous obstetric complications and in the control group 27% had previous obstetric complication. The difference was statistically significant and showed 2.5 times increased risk.

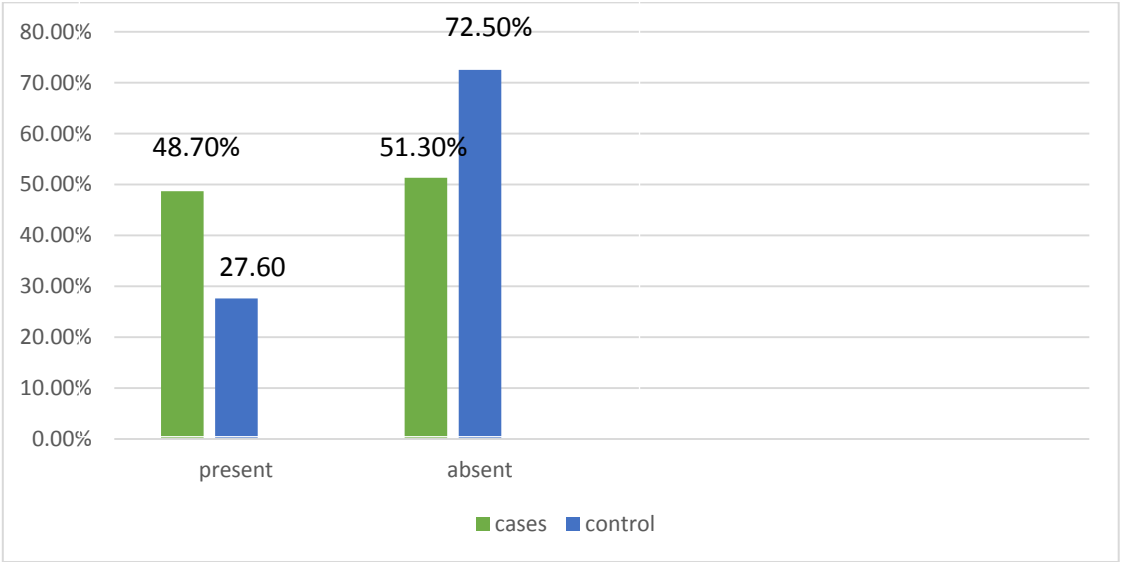


Table 6

	Cases		Control	
Abortion	24	15.4%	9	5.8%
Previous C.S	9	5.8%	11	7.05%
Preterm labour	11	7.1%	9	5.8%
IUGR	9	5.8%	5	5.6%
Twins	2	1.3%	1	0.6%
Placenta Previa	4	2.6%	2	1.3%
Abruption	9	5.8%	5	4.6%
PROM	5	4.6%	2	1.3%
Fibroid complicating pregnancy	4	2.6%	1	0.6%
No history	79	50.6%	113	72.4%

X^2 =11.978 p =0.152

Table 7 Distribution according to family history

	cases		Control	
Positive history	38	24.4%	28	17.9%
Negative history	118	75.6%	128	82.05%

X^2 =0.289 p =0-591
OR =1.56 CI =1.958

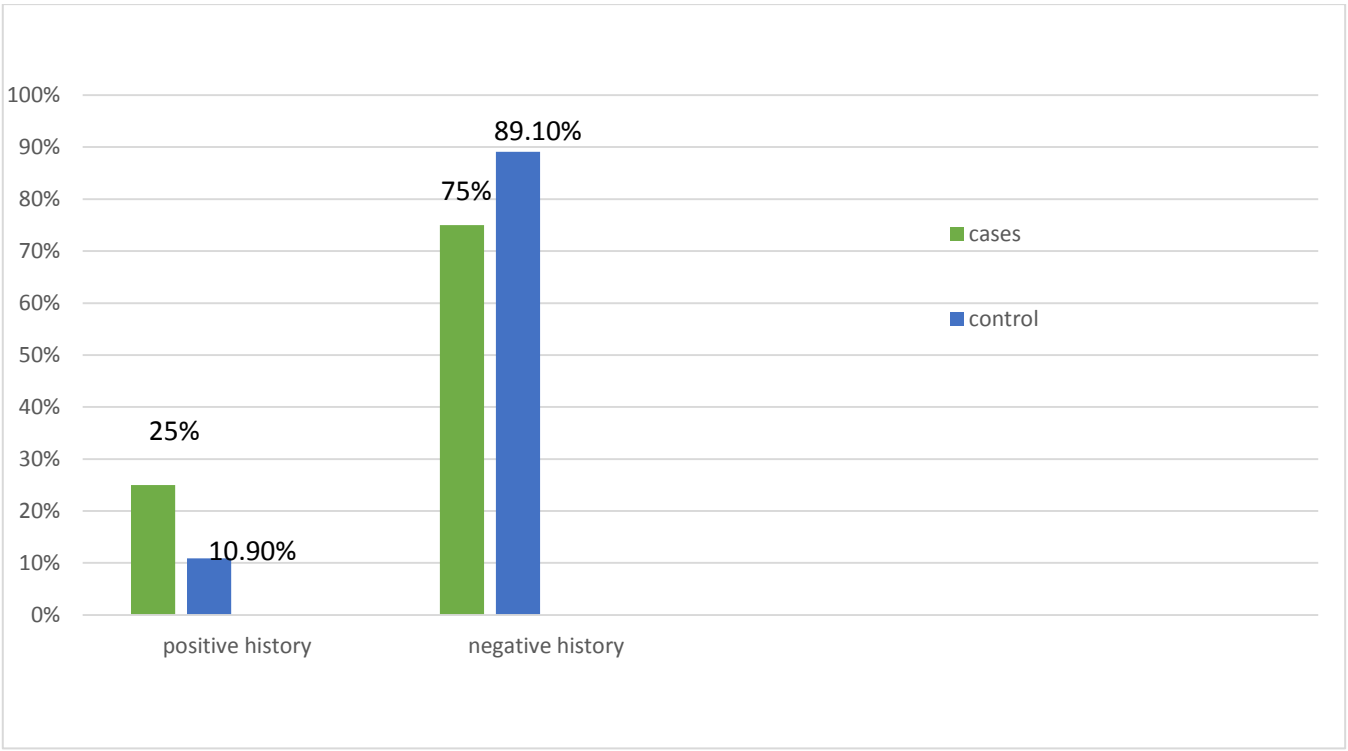
Positive history was more in the study group but was not statistically significant

Table 8 Distribution according to previous pregnancy loss

	cases		control	
Positive history	39	25%	17	10.9%
Negative history	117	75%	139	89.1%

X^2 =10.533 p =0.001
OR =2.75 CI =1,466-5.006

Out of the 156 cases. The observed difference was statistically significant and showed 2.7 times increased risk.



	Cases		Control	
Spont abortion	16	10.3%	6	3.8%
Missed abortion	6	3.8%	3	1.9%
Rec abortion	2	1.3%	-	-
Ectopic	2	1.3%	1	0.6%
IUD	5	3.1%	2	1.3%
Still birth	2	1.3%	1	0.6%
NND	6	3.8%	4	2.6%
No H/o	117	75%	139	89%

X^2 =8.262 p = 0.004

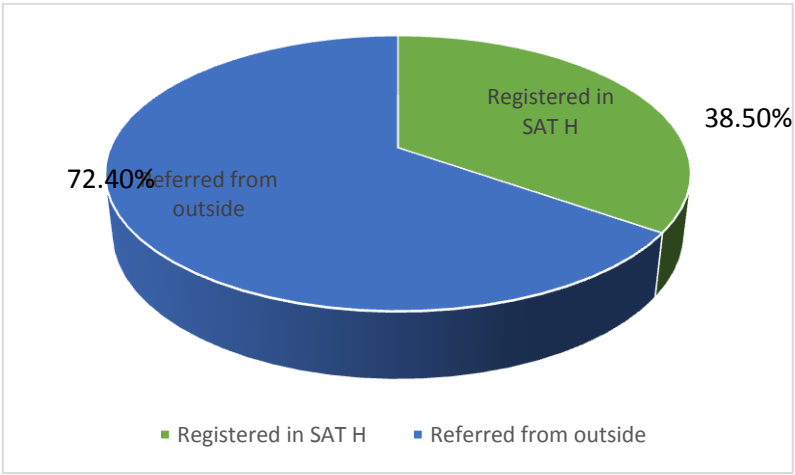
3. Present Pregnancy Details

Table-9: Distribution according to the registration status

	Cases		Control	
Registered in SAT H	60	38.5%	113	72.4%
Referred from outside	96	61.5%	43	27.6%

X^2= 36.44 p = 0.000
OR = 0.236 CI = 0.383

Referred cases were more in the study group and the result was statistically significant. It is because SAT H is a tertiary care centre.



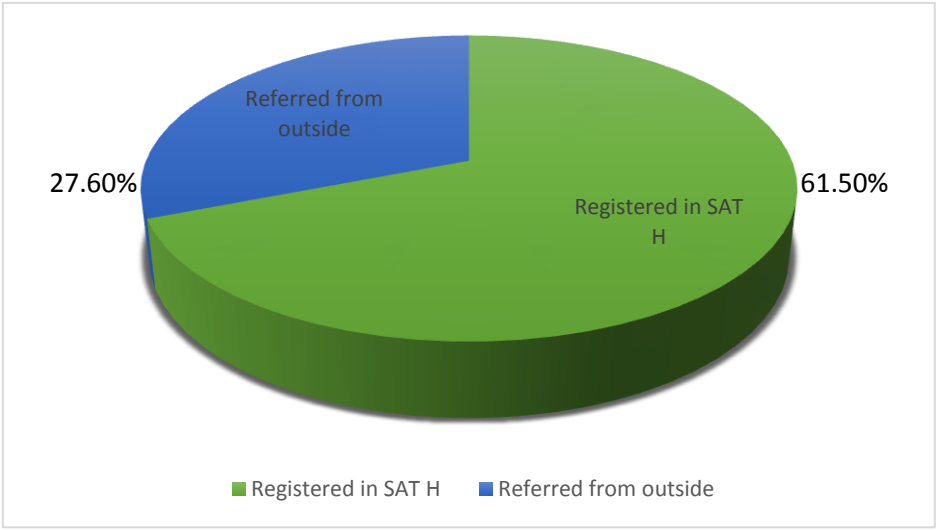


Table-10: Distribution according to first trimester visit

	Cases		Control	
Present	81	51.9%	119	76.2%
Absent	75	48.1%	37	23.8%

X^2= 20.113 p = 0.0004
OR = 0.336 CI = 0.207 – 0.045

The observed difference was statistically significant

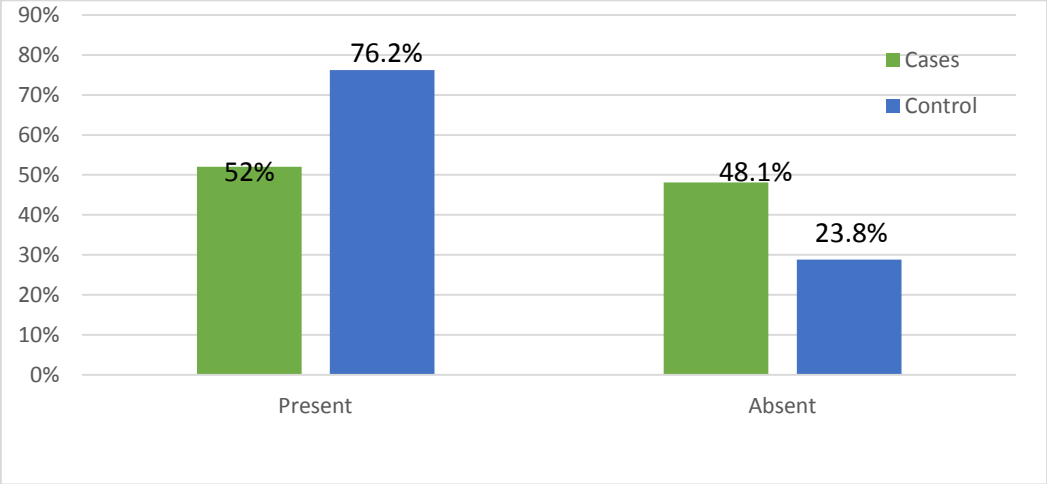


Table-11: Distribution according to the number of visit

	Cases		Control	
No visit	22	14.1%	5	3.2%
1 visit	40	25.6%	25	16%
2 visit	71	45.5%	69	44.2%
3&>	23	14.7%	57	36.5%

X^2= 28.968 p = 0.000

Antenatal visits were less on the case group and was statistically significant.

Table-12: Distribution according to the treatment for infertility

	Cases		Control	
Yes	17	10%	3	1.9%
No	139	89%	-	98%

X^2 =10.471 p = 0.001

10% of women in the case group had infertility treatment and 1.9% of in the case group had infertility treatment. The observed difference was statistically significant.

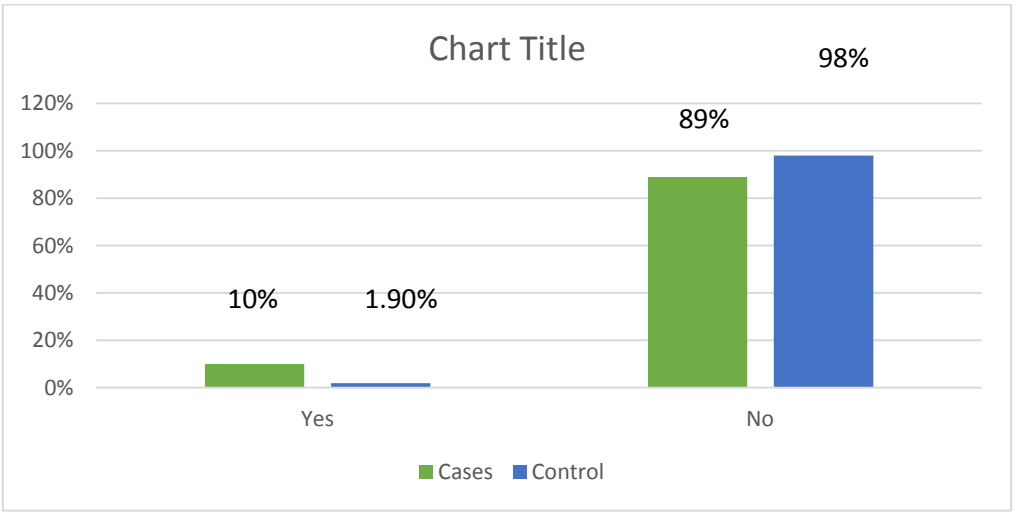


Table-13: Gravida

	Cases		Control	
G_1	61	39.1%	77	49.4%
G_2	76	48.7%	63	40.4%
G_3	17	10.9%	16	9.6%
G_4 &more	2	1.3%	1	0..6%

X^2= 3.431 p= 0.330

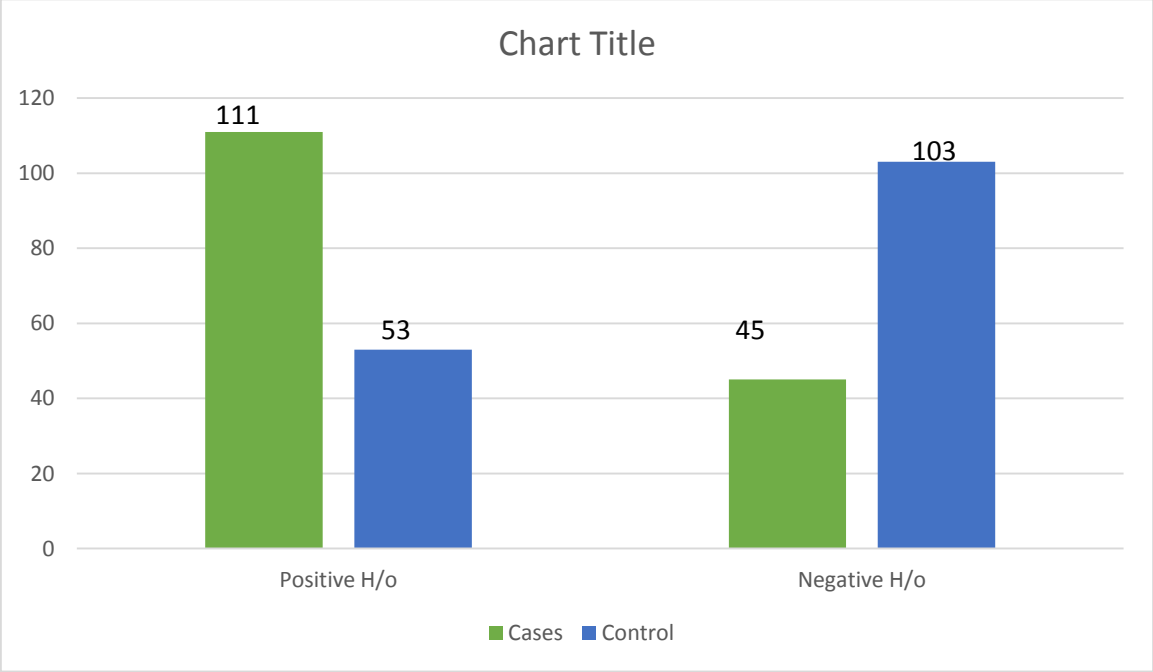
In the case group as gravidity increases abortion chance also increase. But the observed difference was not statistically significant due to the small sample size.

Table-14: Distribution according to antenatal complications

	Cases	Control
Positive history	111	53
Negative history	45	103

X^2= 47.94 p=0.000
OR= 5.275 CI=3.247 – 8.565

Out of 156 cases 111 cases showed antenatal complications compared to 53 cases in control group, which showed antenatal complications and the observed difference was statistically significant.



	Cases		Control	
PIH	7	4.5%	8	5.1%
Low lying placenta	19	12.1%	6	3.8%
Twins	6	3.8 %	2	1.3%
DM	14	8.9%	7	4.5%
Fibroid	7	4.5%	2	1.3%
Cervical incompetence	7	4.5%	1	0.6%
APLA	4	2.4%	0	-
Vaginal discharge	6	3.8%	4	2.6%
Recurrent UTI	18	11.53%	7	4.5%
Hyperemesis	10	6.1%	8	5.1%
Hypertension complicating pregnancy	12	7.4%	5	5.1%
Spotting in first trimester	4	2.4%	2	1.2%

X^2 =0.6% p= 0.000

Table-15: Distribution according to ultrasound findings

	Cases		Control		X^2&p	OR&CI
Low lying placenta	19	12.2%	6	3.8%	$X^2 = 7.349$	OR=3.467
Cervical incompetence	7	4.5%	1	0.6%	P=0.007	CI=43.45-8.951
Missed abortion	7	4.5%	0	-	$X^2 = 4.618$	OR=7.282
Retro placental clot	4	2.6%	7	4.4%	P = 0.032	CI=0.885-59.97
Oligamnios	9	5.6%	2	1.3%		
Fibroid	7	4.4%	2	1.3%		
Twins	6	5.6%	137	87.8%		
Normal-USS	53	34%	-	-		
No-USS	44	28.2%				

Low lying placenta and cervical incompetence showed statistically significant difference.

Discussion

In the present study as age advances chance of abortion increased but was not statistically significant. It is due to small sample size. According to Warburton and Frazer the risk of spontaneous abortion increases with maternal and paternal age[3].Studies by Rasussen[4] et al in which maternal age, multiparity and low level education increases the risk for abortion. Past medical history was statistically significant in my study, study by Mills[3] and associates reported the poor glycemic control resulted in marked increase in abortion rate. Several studies support this. Sibai[3] and colleagues reported that placental abruption is 1.5 percent with chronic hypertension. In the present study positive history of previous obstetric complications were present in study group which was statistically significant. According to Clifford et al positive previous obstetric history is important predictor of future pregnancy outcome. Frias A[5] and colleagues in their study noted that women with previous abortion had poor outcome in subsequent pregnancy. Study by Rasmussen[4] et al showed multiparity is a risk factor for unexplained fetal loss. Several studies[6, 7] reported association of fibroid and abortion, but in my study it was not statistically significant. In the present study low lying placenta is one of the cause for APH and spontaneous abortion which is consistent with study by Tremevan RZ[8].In the present study there was 10.9 % cases with history of infertility treatment and 1.9% of control. This study is statistically significant. This may be due to associated factors like age of patient, congenital uterine anomalies, cervical incompetence and fibroid, in the present study 4 cases of women with APLA syndrome. According to ACOG prevalence of APLA in general population is 5% and present with second trimester pregnancy loss. Similar study done by AlonsoA[9] .According to Newman RB[10] multiple pregnancies increase in the last two decades due to assisted reproduction techniques and constitutes 15% of preterm births. According to Weiss et al[11] first trimester bleeding is an independent risk factors of an adverse obstetric outcome. According to McNaughten[3] and colleagues 13% of women with cervical incompetence had second trimester abortion. On bivariate analysis referred late from outside, poor antenatal follow up, history of recurrent UTI, diabetes, previous abortion, infertility, cervical incompetence and low lying placenta were found be significant risk factors for abortion. Improved antenatal care and appropriate intervention can prevent some of these risk factors.

Summary

Prevalence of spontaneous second trimester abortion was 18%.majority were referred cases .late referral and irregular follow up were the significant risk factors found. Women with positive past medical history had 2.5 times increased risk. Diabetes complicating pregnancy had 3.8 times increased risk. Women with previous pregnancy loss had 3 times increased risk. Women with history of infertility had 6 times risk and cervical incompetence had 7 times risk, but maternal age gravida and parity socio economic status were not found to be statistically significant.

Conclusion

This study suggest that spontaneous second trimester abortion can be avoided by appropriate counselling and proper evaluation and do timely interventions.

Improved obstetric care can provide successful pregnancy for the great majority of these high risk women.

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