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MATERNAL AND FETAL OUTCOME OF PYREXIA IN PREGNANCY BEYOND 28 WEEKS OF GESTATION-A PROSPECTIVE COHORT STUDY

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ABSTRACT

Background: Pyrexia in pregnancy is a very common clinical entity worldwide. Fever during pregnancy causes significant maternal and fetal complications. Any acute or chronic infectious diseases may be aggravated during the period of pregnancy. Altered or compromised functions of immune system may predispose to several infections.

Objectives: Fever in pregnancy is a common clinical problem which increases risk of morbidity of the mother and fetus. We studied the variable medical complications of pregnant women suffering from fever and the possible fetal complications.

Materials and Methods: In this research 183 pregnant women with fever were studied prospectively. Necessary investigations to detect the underlying cause were performed. Patients with fever due to septic abortions and blood transfusions were excluded. Maternal complications and adverse perinatal outcomes in terms of preterm delivery, perinatal death, low birth weight (LBW) and low Apgar score at 5 minutes after birth were recorded. Frequency of occurrence of maternal complications was compared according to their age, parity and period of gestation.

Results: Maternal complications are more common in the study group when compared to the control group **and the p value is 0.000.**Neonatal sepsis and low apgar score at birth are more specific and sensitive fetal outcome and their **p value is 0.000** which is statistically more significant. There were 2 perinatal deaths in the study group.

Conclusion: A wide range of maternal and fetal complications can occur due to pyrexia in pregnancy from various causes. These complications can be preventable if the patient present to the hospital at an early time. The maternal and fetal complications can be avoidable if the cause for the fever is diagnosed and treated accordingly.They should be treated with antipyretics and antibiotics according to their etiology to prevent the adverse maternal and fetal mortality and morbidity. Hence standard methods for infection control in homes, communities and health care settings should be emphasized.

KEYWORDS : Low birth weight, Pregnancy, Pregnancy complications, Pregnancy outcome, Pyrexia

INTRODUCTION:

Pyrexia in pregnancy is a very common clinical entity worldwide. Fever during pregnancy causes significant maternal and fetal complications. Any acute or chronic infectious diseases may be aggravated during the period of pregnancy. Altered or comprom ised functions of immune system may predispose to several infections. Restrictions of antibiotics due to teratogenicity preclude the infection control. Anatomical and physiological changes occurs during pregnancy may predispose certain infections, for example, the urinary tract infections.

Some infections are affecting the mother and also may be transmitted to the fetus in utero. The effect of fever during pregnancy depends on the level of temperature rise, duration and the stage of fetal development. Some febrile diseases will lead to more severe and life threatening course in pregnancy and transplacental transmission leading to adverse fetal outcome. Pyrexia during pre implantation, embryonic and fetal development period, may result in miscarriage, growth restriction, preterm labor and still birth.

Protein synthesis was interfered by hyperthermia via heat-shock proteins, S-phase cell death is induced and delay in mitotic activity M phase. Vascular disruption and placental infarction also can happen. Ultimately it will lead to lethal malformations and fetal death. Furthermore, uterine contractility will be increased by pyrexia can lead to expulsion of the fetus at a non-viable stage of gestation. The hyperthermia induced feto-maternal outcome will differ according to the gestational time of exposure.

Fetus being an integral part of the fetomaternal unit and pregnancy involving numerous physiological changes and adaptations, pyrexia during the pregnancy affects both the mother and her fetus adversely. Normally during intrauterine life, the temperature of fetus is maintained by utero-placental circulation and heat-exchange at the amniotic fluid interface. Pyrexia effect on pregna ncy depends on the extent of the rise in the temperature.

Because of maternal pyrexia, various inflammatory mediators as evidenced by umbilical cord blood cytokines is documented in the absence of neonatal sepsis (5).The underlying Maternal cytokine polymorphism is strongly associated with both intra partum fever & cerebral palsy at term.(6,7)

Some infectious diseases are more severe in pregnancy (e.g. Plasmodium falciparum, Listeria monocytogenes, hepatitis E virus (HEV), herpes simplex virus and influenza).

Increased brain temperature increases oxygen consumption and also lowering the threshold for hypoxic injury. Hypoxic brain injury is increased by hyperthermia in term neonates (8, 9).

The study was undertaken with the specific objective to assess the maternal and fetal complications due to pyrexia in pregnancy and also to find the different etiology of pyrexia in pregnancy.

AIMS AND OBJECTIVES OF THE STUDY

1. To find the maternal complications and fetal outcome of pyrexia in pregnancy beyond 28 weeks of gestation
2. To find the etiology and prevalence of pyrexia in pregnancy beyond 28 weeks of gestation

TYPE OF STUDY

Prospective Cohort study

PERIOD OF STUDY

JANUARY 2017-JULY 2017

PLACE OF STUDY

Antenatal OPD, Antenatal Ward, Labour ward, Dept of Obstetrics & Gynaecology
Govt Tiruvarur Medical College &Hospital, Tiruvarur.

INCLUSION CRITERIA

CASES

1) Pregnant women with fever for more than 2 days (temperature >38*C orally)
2) Gestational age 28-40wks(sure of gestational age by LMP or USG in 1st and early 2nd trimester)

CONTROL

- Healthy pregnant women of gestational age of 28-40wks

EXCLUSION CRITERIA

1) Pyrexia due to blood transfusion
2) Connective tissue disorder
3) Renal disorder
4) Severe Anemia
5) Cardiovascular disease

SAMPLE SIZE

Cohort (exposed to fever) - 90
Control (not exposed to fever) -90

MATERIALS AND METHODS

1) All the patients attending the antenatal opd and admitted in antenatal and labour ward with fever who satisfy the eligibility criteria will be included till the sample size is reached and compared to equal number of healthy pregnant women without fever beyond 28 weeks of gestation.
2) After getting consent from the patient ten ml of venous blood will be withdrawn for peripheral smear, blood culture and sensitivity, dengue Ig G and Ig M,total count,differential count, platelet count and haemoglobin.

Results:

Table:1
MATERNAL COMPLICATIONS GROUP

			GROUP		
			COHORT	CONTROL	Total
MATERNAL COMPLICATIONS GROUP	NO	Count	32	81	113
		% within GROUP	35.6%	90.0%	62.8%
	YES	Count	58	9	67
		% within GROUP	64.4%	10.0%	37.2%
	Total	Count	90	90	180
		% within GROUP	100.0%	100.0%	100.0%

Maternal complications-chi square value is 57.084 and the p value is 0.000 which is statistically more significant. Maternal complications due to fever are more in cohort when compared to control group.

Table:2
LOW BIRTH WEIGHT

			GROUP		
			COIHORT	CONTROL	Total
LBW	NO	Count	58	67	125
		% within GROUP	64.4%	74.4%	69.4%
	YES	Count	32	23	55
		% within GROUP	35.6%	25.6%	30.6%
	Total	Count	90	90	180
		% within GROUP	100.0%	100.0%	100.0%

Chi square value is 2.121 and p value is 0.145 which is statistically not significant. The birth weight of the baby is due to gestational age at birth.

Table:3
PRETERM LABOUR

21.1% in the study group and 12.2% in the control group had preterm labour.The chi square value is 2.560 and the p value is 0.110. Relative risk is 1.7273 and 95% confidence interval is 3.4186. Preterm labour is more in the study group compared to the control group.

			GROUP		
			COHORT	CONTROL	Total
PRETERM	PRETERM	Count	19	11	30
		% within GROUP	21.1%	12.2%	16.7%
	TERM	Count	71	79	150
		% within GROUP	78.9%	87.8%	83.3%
	Total	Count	90	90	180
		% within GROUP	100.0%	100.0%	100.0%

Table:4
NEONATAL SEPSIS

			GROUP		
			COHORT	CONTROL	Total
NEONATAL SEPSIS	NO	Count	63	82	145
		% within GROUP	70.0%	91.1%	80.6%
	YES	Count	27	8	35
		% within GROUP	30.0%	8.9%	19.4%
	Total	Count	90	90	180
		% within GROUP	100.0%	100.0%	100.0%

For neonatal sepsis the chi square value is 12.804 **and p value is 0.000** which is statistically significant. Neonatal sepsis was more common in cohort when compared to controls. It is more common in patients exposed to fever.

Table:5
INTRA UTERINE GROWTH RETARDATION

			GROUP		
			COHORT	CONTROL	Total
GROWTH RETARDATION	NO	Count	74	72	146
		% within GROUP	82.2%	80.0%	81.1%
	YES	Count	16	18	34
		% within GROUP	17.8%	20.0%	18.9%
	Total	Count	90	90	180
		% within GROUP	100.0%	100.0%	100.0%

As regards intrauterine growth retardation the chi square value is 0.145 and the p value is 0.743 which is statistically not significant.

Table:6
APGAR <7/10 * GROUP

			GROUP		
			COIHORT	CONTROL	Total
APGAR <7/10	NO	Count	72	87	159
		% within GROUP	80.0%	96.7%	88.3%
	YES	Count	18	3	21
		% within GROUP	20.0%	3.3%	11.7%
	Total	Count	90	90	180
		% within GROUP	100.0%	100.0%	100.0%

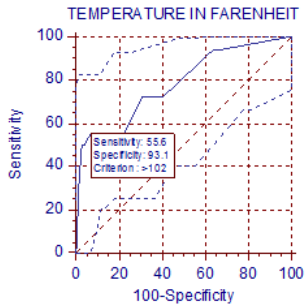
A regards APGAR the chi square value is 12.129 **and p value is 0.000** which is statistically very significant. Low APGAR score are more common in patients who had fever during labor and they need neonatal resuscitation.

ROC :Receiving Operating Characteristic curve:

It is used to find out the optimum cut off value of fever (fahrenheit) values with respect to complications,

Diagram:1

APGAR LESS THAN 7/10



ROC curve

Variable	TEMPERATURE_IN_FARENHEIT TEMPERATURE IN FARENHEIT
Classification variable	APGAR__7_10 APGAR <7/10

Sample size		90
Positive group :	APGAR <7/10 = 1	18
Negative group :	APGAR <7/10 = 0	72

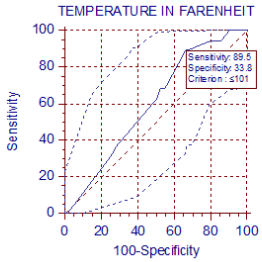
Disease prevalence (%)	unknown

Area under the ROC curve (AUC)

Area under the ROC curve (AUC)	0.785108
Standard Error[a]	0.0649
95% Confidence interval[b]	0.685944 to 0.864734
z statistic	4.395
Significance level P (Area=0.5)	<0.0001

For APGAR < 7/10, sensitivity is 55.6 and specificity is 93.1. The area under the curve is 0.785 and the significance level is <0.0001 which is statistically significant.

Diagram: 2
PRETERM LABOUR



ROC curve

Variable	TEMPERATURE_IN_FARENHEIT TEMPERATURE IN FARENHEIT
Classification variable	PRETERM

Sample size		90
Positive group :	PRETERM = 1	19
Negative group :	PRETERM = 0	71

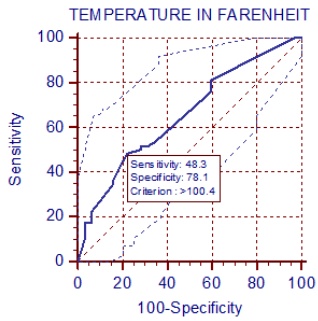
Disease prevalence (%)	Unknown

Area under the ROC curve (AUC)

Area under the ROC curve (AUC)	0.600074
Standard Error[a]	0.0664
95% Confidence interval[b]	0.491416 to 0.701955
z statistic	1.508
Significance level P (Area=0.5)	0.1317

For preterm labor, sensitivity is 89.5 and specificity is 33.8. Are under the curve is 0.785 and the significance p value is 0.1317.

Diagram:3
MATERNAL COMPLICATIONS



ROC curve

Variable	TEMPERATURE_IN_FARENHEIT TEMPERATURE IN FARENHEIT
Classification variable	MATERNAL_COMPLICATIONS_GROUP MATERNAL COMPLICATIONS GROUP

Sample size		90
Positive group :	MATERNAL COMPLICATIONS GROUP = 1	58
Negative group :	MATERNAL COMPLICATIONS GROUP = 0	32

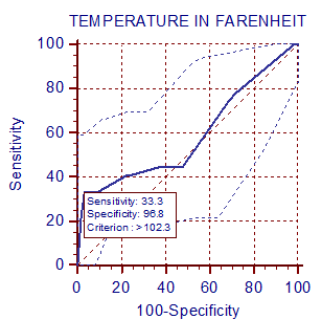
Disease prevalence (%)	unknown

Area under the ROC curve (AUC)

Area under the ROC curve (AUC)	0.655711
Standard Error[a]	0.0592
95% Confidence interval[b]	0.548120 to 0.752736
z statistic	2.630
Significance level P (Area=0.5)	0.0086

Sensitivity is 48.3 and specificity is 78.1 .The area under the curve is 0.655 and the significance p vaue is 0.008.Maternal complications are more in cohort when compared to control group.

Diagram:4
NEONATAL SEPSIS



ROC curve

Variable	TEMPERATURE_IN_FARENHEIT TEMPERATURE IN FARENHEIT
Classification variable	NEONATAL_SEPSIS NEONATAL SEPSIS

Sample size		90
Positive group :	NEONATAL SEPSIS = 1	27
Negative group :	NEONATAL SEPSIS = 0	63
Disease prevalence (%)	unknown	

Area under the ROC curve (AUC)

Area under the ROC curve (AUC)	0.586420
Standard Error[a]	0.0715
95% Confidence interval[b]	0.477704 to 0.689284
z statistic	1.208
Significance level P (Area=0.5)	0.0071

Sensitivity is 33.3%and specificity is 96.8.Area under the curve is 0.586 and the significance p value is 0.007 which is statistically more significant. Neonatal sepsis was more common in persons exposed to fever.

CONCLUSION

A wide range of maternal and fetal complications can occur due to pyrexia in pregnancy from various causes. These complications can be preventable if the patient present to the hospital at an early time. The maternal and fetal complications can be avoidable if the cause for the fever is diagnosed and treated accordingly.

They should be treated with antipyretics and antibiotics according to their etiology to prevent the adverse maternal and fetal mortality and morbidity. Hence standard methods for infection control in homes, communities and health care settings should be emphasized.

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