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Research Article

**EVALUATION OF HIGH RISK OF ARRHYTHMIA IN  
PREGNANCIES OF ADVANCED AGE**<sup>1</sup>Dr Maryam Nisar, <sup>2</sup>Dr Maryam Abd u razzaq<sup>1</sup>Allama Iqbal Medical College, Lahore<sup>2</sup>WMO, BHU Bojhi kot, DHA Sargodha

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**Abstract:**

**Objective:** Cardiovascular mortalities normally occur in pregnancies of older age and most common 3<sup>rd</sup> reason behind this is arrhythmia. The purpose of this research work was to find out whether the enhanced arrhythmia risk increases with the pregnancies in elder age.

**Methodology:** In this research work, 280 pregnant females, of whom 98 females of advance age and 182 females under 35 years of age were the part of this research work. We evaluated the arrhythmia risk with the measurement of the duration of electrocardiographic P-wave, interval of QT, interval of T peak-to-end and ratio of Tp-e/QT.

**Results:** Although we found no disparities in the interval of Tp-e and ratio of Tp-e/QTc between the females of both groups, the highest QTc, lowest QTc and QTc dispersion values were much high in the pregnancies of advanced age as compared to the values in group of controls. Additionally, the pregnancies of older ages were present with high P dispersion. Correlation analysis showed that enhanced QTc dispersion and P were present having association with the maternal age. Analysis by multiple linear regression displayed that QTc dispersion was autonomously having association with the maternal age.

**Conclusion:** Repolarization factors increase in the pregnancies of advance age even all these parameters are in normal range, which should result into an examination whether this is a condition of pathology.

**KEYWORDS:** Pathology, Dispersion, Fertility, Arrhythmia, Electrocardiogram, Advanced Age.

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**INTRODUCTION:**

From last two decades, the reproductive attitude of females has changed because of improvement in social and economic standards, high education and complications linked with acquiring jobs. These are the reason of late pregnancy among females [1]. In various countries of the world which are developed, most of the child births are the outcome in advance age of pregnancy. In country of Canada, the amount of the live births to females from 30 to 39 years old has increased from 23.6% in 1982 to 45.9% in the year of 2015 [2]. The advanced maternal age showed an association with the reduced fertility and enhanced danger of still birth, live birth before term, low weight at the time of birth and adverse outcome of pregnancy [3-5]. Different research works have concluded that females with more than 35 years of age had adverse outcomes of pregnancy and they are thought to be as an age cut-off [1-5].

In one research work examining pregnancy until 1 year postpartum, 22.2% maternal mortalities were the outcome due to cardiovascular complications and females in these complications were of higher age [6]. Advanced age of females during pregnancy is accountable for the high rate of morbidity as well as mortality, obstetric issues, high rate of miscarriage, death of infants and stillbirths. No research work has evaluated the danger of arrhythmia, which is the main reason of the cardiovascular complications leading to maternal deaths. The main purpose of this research work was to find out the arrhythmia risk with the measurement of duration of electrocardiographic P-wave, interval of QT, interval of T peak-to-end and ratio of Tp-e/QT in females having more than 35 year of age.

**METHODOLOGY:**

The ethical committee of Jinnah Hospital, Lahore gave the approval to conduct this research work. All the pregnant females having advanced age of  $\geq 35$  years and less than 35 years as controls in their last three months of pregnancy period in accordance with the last menses cycle and

measurement of ultrasound who got admission in the Obstetric Department were the part of this research work. 280 females were the participants of this research work in which 98 females were present with advance age and 182 females were present with less than 35 year of age. All the females present with hypertension, multiple pregnancies, Diabetic Mellitus, preeclampsia, coronary diseases or any other complications were not the part of this research work. We recorded a twelve lead ECG for every female once in the 3<sup>rd</sup> trimester in supine position. There was requirement of recordings at suitable speed of 50 mm/s, with one mV/cm standardization. We used the magnifying glasses for the improvement in precision. Very initial deflection from isoelectric line was the onset of P wave. We measured the highest and lowest duration of P wave and their differences were the P dispersion. The measurement of interval of QT performed from the start of QRS complex to finish of T wave and its correctness carried out for the heart rate with the utilization of the Bazett formula,  

$$cQT = QT \sqrt{(R-R \text{ interval})}$$

We defined the interval of Tp-e as time interval from end to peak of T wave and the calculation of the ratio of Tp-e/QTc carried out from other measurements. SPSS V.23 was in use for the statistical analysis of the collected information. We tested the data for normality of distribution with the utilization of the Kolmogorov-Smirnov test. We present the categorical data in averages and percentages. We used the Student T-test for the comparison of the distributed data of two groups. We used the Chi-square method for the evaluation of the categorical data. We used the Pearson rank tests to show the association of the maternal age with the duration of QTc, interval of Tp-e and ratio of Tp-e/QTc. P value of less than 0.05 was the significant value.

**RESULTS:**

All the pregnant females were nulliparous and they were in their last three months of pregnancy period (from 28 to 40 weeks). The obstetric characteristics and traits of demography are present in Table-1.

**Table-I: Characteristics of the study population.**

Characteristics	Group-1 (>35 years)		Group-2 (<35 years)		P-value
	Mean	SD	Mean	SD	
Maternal age, years	38.5	2.57	23.5	4.16	<0.001
Gestational week	34.7	3.5	33.4	3.4	0.008
BMI, kg/m <sup>2</sup>	30.4	4.9	28.2	4.3	<0.001
Heart rate, bpm	90.7	14.8	89.9	15.5	0.680
Systolic BP, mmHg	117.4	9.6	112.4	10.2	<0.001
Diastolic BP, mmHg	70.8	8.6	64.6	8.6	<0.001

The females of the Group-1 were having advanced age. There was a naturally increased BMI in the females of Group-1. The characteristics of laboratory findings of the females of both groups at the time of their admission are available in Table-2.

**Table-II: Laboratory Tests Results Of The Study Population At Assessment**

Clinical Parameters	Group-1 (>35 years)		Group-2 (<35 years)		P-value
	Mean	SD	Mean	SD	
Hemoglobin (g/dl)	11.8	1.3	11.8	1.2	0.840
Platelet (x103) - /dL	242.6	59.4	229.1	65	0.080
WBC	11508	2422	12036	2135	0.100
BUN (mg/dl)	16.3	3.9	16.6	4.7	0.530
Creatinine (mg/dl)	0.48	0.08	0.46	0.07	0.060
Sodium (mg/L)	137.4	1.9	137.8	1.8	0.420
Potassium (mg/L)	4.1	0.3	4.1	0.2	0.930

We found no disparity in the interval of Tp-e and ratio of Tp-e/QTc between the females of both groups, the values of highest QTc, lowest QTc and QTc dispersion were much high in the females of Group-1 in comparison with the females of the control group (Table-3).

**Table-III: The Electrocardiographic Findings Of The Study Population**

ECG Findings	Group-1 (>35 years)		Group-2 (<35 years)		P-value
	Mean	SD	Mean	SD	
Maximum QTc interval (ms)	403.7	27.8	393.3	14.6	< 0.001
Minimum QTc interval (ms)	381.8	23.7	373.8	13.2	0.002
QTc dispersion (ms)	21.8	8.7	19.5	7.2	0.010
Tp-e interval (ms)	76.3	13	74.2	13	0.190
Tp-e/QTc ratio	0.18	0.03	0.18	0.03	0.860
P dispersion (ms)	19.5	7.5	17.8	7.2	0.050

Additionally, P dispersion was high in females having pregnancy in advanced age. There was strong correlation of the enhanced dispersion of QTc and P with the maternal age. Analysis conducted by multiple linear regression displayed that QTc dispersion was present with autonomously association with the age of females (Table-4).

**Table-IV: Results Of Multivariable Analysis Of Independent Predictors Of Qtc Dispersion.**

Variables	Standardized Coefficients	Unstandardized Coefficients (fi)	P-value
Maternal age	0.179	0.183	0.003
BMI	128.00	0.007	0.210

### DISCUSSION:

The most important outcomes of this research work are that ventricular and atrial repolarization factors were much high in females having pregnancies in advance age in comparison with the females present in control group. Additionally, we found that repolarization factors of ventricular and arterial enhanced with the increased age whereas only the maternal age was the marker of the QTc dispersion. Improvements in the social and economic life

styles have changed the attitudes of females about pregnancies. So, there is an increase in the health issues related with obstetrics. Briller examined the particular etiology of maternal mortalities where higher than 20% maternal mortalities have association with the cardiovascular disease like arrhythmia and greater than 25% of these mortalities were preventable [6]. One other research work interrogating the rate of occurrence of arrhythmias, the rate of occurrence of

arrhythmias enhanced, frequently ventricular ectopic activity in pregnancies at young healthy age, especially in those who were present with the palpitation complaints [7].

The hormones of reproduction play a vital role in the start and development of the arrhythmia like supraventricular tachycardia and got the long QT syndrome [8, 9, 10]. The most common clinical tool utilized for the prediction of the arrhythmogenic danger in the medical field is the electrocardiogram. Interval of QT and its improvement heart rate (QTc) [11], dispersion of QT interval and current authenticated markers for the progression of the malign cardiac arrhythmia and recommended as substitute for the stratification of risk of abrupt cardiac mortality in females with extreme clinical condition [13-14].

One research work assessing the danger of cardiac arrhythmia in the group of patients suffering from preeclampsia, highest QT, QTc dispersion, interval of Tp-e and ratio of Tp-e/QTc values were much high in this group as compared to the group of healthy controls pregnant females [15, 16]. One other research work investigating the alterations in ventricular and atrial repolarization predictors in the duration of pregnancy period discovered that Maximum interval of QTc, P dispersion, interval of Tp-e and ratio of Tp-e/QT were much high in the pregnancies of advanced age but they were still in normal range [17]. In a recent research work, Braschi concluded the rise in the ventricular repolarization predictors with the enhanced age [18]. In this current research work, the values of highest QTc, lowest QTc, and QTc dispersion were present to have advancement in older age pregnancies.

### CONCLUSION:

The findings of this research work conclude that repolarization factors were present with high values in the pregnancies of advance age. There should be establishment of the risk scoring for arrhythmia to decrease the high rate of morbidity as well as mortality in high age of more than 35 years with last three months of pregnancy in females.

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