

## Research Article

# ESTABLISHMENT OF SYSTOLIC TIME INTERVAL IN I<sup>ST</sup> TRIMESTER

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## ABSTRACT

Complications during pregnancy and delivery are major public health problems these days both in developing and developed countries. The changing pattern of life style in the modern age aggravates physical and mental stress and strain which leads to increase the incidence of heart diseases as well as morbidity and mortality. Many studies identify that the blood pressure and malnutrition are important risk factors for the cardiovascular diseases and mortality which are due to the deranged left ventricular performance. In present study systolic time interval in first trimester is observed and compared. Further studies are required to measure STI's parameter weekly in 2<sup>nd</sup> and 3<sup>rd</sup> trimester to find out the time for cardiac functions start deteriorating during pregnancy.

**Keywords:** QS<sub>2</sub>, STI- Systolic Time Interval, LVET – left Ventricular Ejection Time, PEP – Pre-ejection Period, PEP/LVET

## INTRODUCTION

Pregnancy is a physiological process which imposes a good deal of functional strain on the cardiovascular system. There occurs progressive increase in cardiac output throughout the pregnancy and comes to pre-pregnancy level in about two weeks after post-partum due to increased stroke out-put (Burwell *et al.*, 1938; Hamilton, 1951; Adam *et al.*, 1954).

The increase in blood volume is 30% and increase is both in plasma and erythrocytes and later may continue to increase till term. Blood pressure and heart rate there is no change in pregnancy. There is no significant change in heart rate and blood pressure during pregnancy.

The evaluation of left ventricular functions of the heart is important in healthy and diseased state of heart. The STI's particularly PEP and LVET are related to age, body weight and both in normal persons and patients of chronic heart diseases. It is notable equation for male and females differ slightly. PEP/LVET ratio may identify left ventricular dysfunctions when either of both PEP-I and LVET-I still within the normal range.

## MATERIALS AND METHODS

The present study consists of 50 normal women with age ranging from 20 to 40 years in which 25 were healthy pregnant women during first trimester of pregnancy in group A and 25 healthy non pregnant women in group B were taken from adjoining villages. It was made sure that the women were not suffering from any cardiovascular diseases. The women showing abnormal ECG or hypertension were not included in this study. Parameters used were QS<sub>2</sub> – Electromechanical systole, LVET – left ventricular ejection time, PEP – Pre-ejection period and PEP/LVET ratio were calculated by using polyrite machine.

## RESULTS AND DISCUSSION

### Results

**Table I: Comparison of heart rate between group B and group A (Mean ±SD)**

Group	No. of subjects	H.R. per Minute
Group B	25	82.62 ± 6.87
Group A	25	82.20 ± 7.79

## Research Article

It was observed that mean heart rate in group B was  $82.62 \pm 6.87$  and mean heart rate in group A was  $82.20 \pm 7.79$ . There was no significant changes observed that the mean and standard deviation of systolic blood pressure in group B was  $113.68 \pm 9.32$  and diastolic blood pressure was  $75.60 \pm 5.713$  in group A.

**Table II: Comparison of the mean and standard division of systolic blood pressure in control group B and group A (Mean  $\pm$ SD)**

Group	No. of subjects	Systolic blood pressure in mm of H.g	Diastolic blood pressure in mm of H.g
Group B	25	$113.68 \pm 9.32$	$76.38 \pm 6.78$
Group A	25	$109.60 \pm 8.236$	$75.60 \pm 5.713$

**Table III: Showing comparison of date of STI's among group A and group B (Mean  $\pm$ SD)**

Group	No. of subjects	QS <sub>2</sub>	LVET	PEP	Ratio PEP/LVET
Group B	25	Mean $360.44 \pm 25.747$	Mean $278.72 \pm 13.672$	Mean $85.56 \pm 6.197$	Mean $0.3075 \pm 0.0251$
Group A	25	Mean $388.08 \pm 16.54$	Mean $292.72 \pm 13.723$	Mean $95.52 \pm 5.776$	Mean $0.3269 \pm 0.0212$

QS<sub>2</sub> value was increased in group A as compared to group B. LVET value was increased in group A as compared to group B. PEP value was increased in group A as compared to group B. PEP/LVET ratio was decreased in group A as compared to group B.

## Discussion

It was been observed that the myocardial functions are abnormal even though there was no clinical signs and symptoms of the heart disease. The clinical signs and symptoms of the disease appear only when there is gross impairment of myocardium.

Good health is one of the most precious gifts of the nature to mankind. But there are many diseases which are continuously spoiling the charm of this gift. It has been observed that the myocardial functions are abnormal even though there are no clinical signs and symptoms of heart disease, clinically signs and symptoms of disease appear only when there is gross impairment of myocardium. So, the heart and its functions have always intrigued the human mind.

The present study has been undertaken to determine the normal values of STI's during normal pregnancy to provide baseline data necessary for further clinical application of method in the pregnant women of this part of country.

The mean value of QS<sub>2</sub> – I,  $525.64 \pm 23.205$  milliseconds in the present study is lower than the value observed by Weissler *et al.*, (1968), Abdullah *et al.*, (1977). The results of the present study are comparable with that of Srivastva *et al.*, (1979). The mean value of QS<sub>2</sub> –I in the present study is higher than the values observed by Manchanda *et al.*, (1974) and Sharma *et al.*, (1991).

The mean value of LVET –I, is  $412.96 \pm 19.144$  milliseconds in the present study is lower than the values observed by William *et al.*, (1970). The only comparable with that of Weissler *et al.*, (1968) and Abdullah *et al.*, (1977) and higher than the values observed by Manchanda *et al.*, (1974) and Srivastva *et al.*, (1979).

The mean value of PEP-I is  $118.6 \pm 6.1115$  milliseconds in the present study is lower than the value observed by Weissler *et al.*, (1968), William *et al.*, (1970), Abdullah *et al.*, (1977) and Srivastva *et al.*, (1979). This could be due to physical status and nutritional variations of subjects under study. The mean values of PEP-I in the present study is higher than the values observed by Ghose *et al.*, (1977). This could be due to regional variations.

The mean value of PEP/LVET ratio  $0.3269 \pm 0.0212$  in the present study is lower than the values observed by Weissler *et al.*, (1968). Only comparable with that the values observed by Abdullah *et al.*, (1977) and Srivastva *et al.*, (1979).

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Pregnancy is a physiological process which imposes a good deal of functional strain on the cardiovascular dynamics of the body. During normal pregnancy these changes have little effect on normal heart which calls upon its substantial reserve to meet the requirements of foetus. But the response of the diseased heart which otherwise appear normal clinically is not always adequate and can lead to decompensatory state of heart.

## **Conclusion**

Further studies are required to measure STI's parameters weekly between 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> trimester to find out the time at which period of pregnancy the cardiac functions are affected with complications.

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**Research Article**

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