



PATTERN OF MEAN ARTERIAL PRESSURE DURING THE COURSE OF PREGNANCY

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ABSTRACT

Background and Objectives: The incidence of Pregnancy Induced Hypertension is in increasing trend nowadays due to sedentary lifestyle during pregnancy and also due to various other factors. The aim of this study is to measure the incidence of PIH in a semi urban population of Tirunelveli town and to know the correlation between failure of a mid-trimester dip in mean arterial pressure and development of PIH later in pregnancy by serial measurement of blood pressure starting from first trimester until delivery of the baby. Main objective is to find out whether failure of mid trimester fall in blood pressure can be used as a predictor for development of PIH. **Materials and Methods:** About 100 pregnant women in their early pregnancy i.e. 6 to 7 weeks pregnancy were selected from semi urban population of Tirunelveli town. These women were selected while attending Kandiapari Government Hospital which is located in Tirunelveli town. Serial measurement of blood pressure done using standard sphygmomanometer once in every two weeks until delivery and mean arterial pressure calculated. Pattern of mean arterial pressure noted in every visit, incidence of PIH noted and correlation between failure of dip in MAP in mid trimester and development of PIH analyzed. **Results:** Incidence of PIH was 5%. Dip in mean arterial pressure at mid trimester was not significant. There was an increasing trend of mean arterial pressure as duration of pregnancy advances. **Conclusion:** PIH is multifactorial. Failure of fall in mean arterial pressure in mid trimester alone cannot be used as a predictor of PIH.

KEYWORDS : Mean Arterial Pressure, PIH, Mid Trimester.

INTRODUCTION

Pregnancy induced hypertension or Preeclampsia is a form of high blood pressure during pregnancy which usually appears after 20 weeks of gestation. It occurs in about 7 to 10% of all pregnancies. It is defined as systolic pressure of >140 mmHg and diastolic pressure of >90 mm Hg. PIH is a major cause of maternal and fetal morbidity and mortality. The mechanism responsible for development of PIH was not fully elucidated. Even though PIH is multifactorial, studies during the past decade have provided a better understanding of the potential mechanisms responsible for the pathogenesis of PIH. The initiating event in PIH appears to be reduced utero placental perfusion as a result of abnormal cytotrophoblast invasion of spiral arterioles. Placental ischemia lead to dysfunction of maternal vascular endothelium that results in enhanced formation of endothelin and thromboxane, increased vascular sensitivity to angiotensin II and decreased formation of vasodilators such as nitric oxide and prostacyclin. So the tendency to develop PIH is decided during implantation itself even though PIH develops clinically after 20 weeks of gestation.

Mean arterial pressure (MAP) is the average arterial pressure throughout one cardiac cycle. A common method to estimate MAP is the following formula

$$\text{MAP} = \text{Diastolic Pressure} + \frac{1}{3} (\text{Pulse Pressure}).$$

The normal value is 95 mm Hg and the normal range is 80 to 100 mm Hg.

It has been described in late 1960s that there is a drop in blood pressure especially diastolic blood pressure in the second trimester at around 18 weeks. The so called secondary wave of trophoblastic invasion, which produces deep modifications of the spiral arteries, and makes them insensitive to vasoconstrictors. However recent studies show that there is no mid trimester drop but rather an increase as compared to the first trimester blood pressure. The present study aims at knowing the incidence of PIH, whether significant mid trimester drop in BP occur and if it occurs whether it can be used as a predictor for occurrence of PIH.

AIMS AND OBJECTIVES

- To find out the incidence of PIH in a semi urban population of Tirunelveli District
- To know the occurrence of significant fall in mean arterial pressure in mid trimester
- Whether mid trimester dip in MAP can be used as a predictor for development of PIH

MATERIALS AND METHODS

This is a prospective cohort study conducted in the antenatal department of Government Kandiapari Hospital, Tirunelveli District. Study period was 8 months.

Inclusion Criteria

Antenatal women both primi as well as multi at 6 weeks pregnancy attending GH, Kandiapari, Tirunelveli District.

Exclusion Criteria

- Known hypertensive complicating pregnancy
- Other medical disorders complicating pregnancy
- Ectopic, nonviable and multiple pregnancies

METHODOLOGY

Ethical committee clearance obtained at Tirunelveli Medical College. 100 pregnant women selected at Kandiapari GH antenatal department during their visit for early registration. i.e. at 6 weeks gestation. Viable singleton pregnancy confirmed by ultrasound scan. After getting informed and written consent from them, blood pressure measured by using standard sphygmomanometer and mean arterial pressure calculated. They were asked to come regularly once in 2 weeks. Their visits were motivated by concerned village health nurses. During every visit mean arterial pressure measurement recorded until their delivery and the results analyzed regarding the incidence of PIH, the trend of mean arterial pressure during the course of pregnancy, whether there is a falling trend of MAP in mid trimester. Mid trimester mean arterial pressure at 18 weeks was compared with 6 weeks and also with 14 weeks.

RESULTS

Out of 100 antenatal mothers one primi aborted spontaneously at 8 weeks, one multigravida delivered preterm at 32 weeks. All others delivered full term. 3 primi and 2 multigravida totally 5 developed PIH during the course of pregnancy. Even though there was a dip in mean arterial pressure at 18 weeks when compared to 6 weeks and 14 weeks it was not significant and also there was an increase in trend of mean arterial pressure as duration of pregnancy advances.

Table 1: Age and Parity wise distribution of antenatal mothers

Age Group	Primi	Multi	Total
18 – 20 yrs.	5	-	5
21 – 25 yrs.	31	8	39
26 – 30 yrs.	15	28	43
31 – 35 yrs.	4	9	13
36 – 40 yrs.	55	45	100

56.36% of prim gravida fell under 21 to 25 yrs. and 62.22 % of multigravida fell under 26 to 30 yrs. age group.

Table 2: Average Mean Arterial Pressure distribution during pregnancy

Duration of pregnancy in weeks	6	10	14	18	22	26	30	34	38
Average MAP in primi(mm Hg)	79.3	81.3	80	79	83.2	86.6	87.8	89.6	91.3

Average MAP in multi(mm Hg)	80	83.3	82.6	79.8	80.6	84.8	86.8	88.2	92.3
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Table 3: Comparison of Mean arterial pressure at 6 weeks and 18 weeks

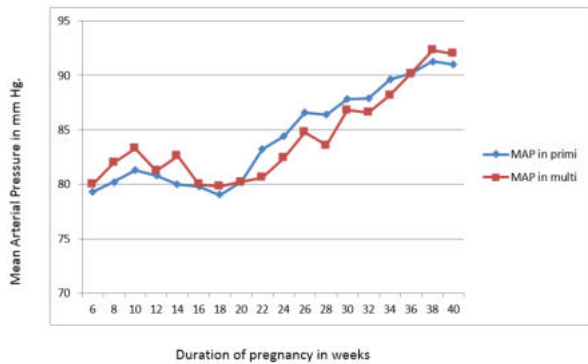
Parameter	At 6 wks.	At 18 wks.
Mean MAP	79.65	79.4
SD	2.83	3.12

P value 0.06. Not significant.

Table 4: Comparison of Mean Arterial Pressure at 14 weeks and 18 weeks

Parameter	At 14 weeks	At 18 weeks
Mean MAP	81.3	79.4
SD	3.62	3.12

P value 0.04. Not significant.



There is an increase in trend of mean arterial pressure during the course of pregnancy except for an insignificant dip at 18 weeks.

CONCLUSION

Pregnancy Induced Hypertension is multifactorial. Incidence in the present study is found to be 5%. There is an increasing trend of mean arterial pressure as duration of pregnancy advances. The fall in mean arterial pressure at mid trimester is insignificant. So it cannot be used as a predictor for development of PIH.

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