

BLOOD PRESSURE IN PREGNANCY

by

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SUMMARY

In 350 cases of normal pregnancy blood pressure was recorded throughout pregnancy and analysed. The average pre-pregnancy blood pressure was 116.58/76.28 mm. of Hg. (Pulse pressure 40.30 mm. of Hg.). Average intrapartum blood pressure started to fall from 8th week of pregnancy and maximum fall was at 20th week of pregnancy. Maximum fall of systolic pressure was 11.53 and that of diastolic pressure was 11.87 mm of Hg. Blood pressure gradually rose in third trimester till term. Analysis of blood pressure according to variation showed that in only 43.43% of the cases there were actual mid pregnancy fall and then rise. And in 37.7% there were only rise in pressure; in 6.85% there were no change at all. Age had no influence on the course of blood pressure during pregnancy.

Introduction

Pregnancy induces a profound change in maternal haemodynamics and thereby influences a change in blood pressure. Hare and Karn (1929) were among the first to study blood pressure and noted that during midpregnancy there was a tendency to fall of blood pressure compared with the pressure at the beginning of pregnancy. Andors (1945) did not find significant change in blood pressure, but the diastolic pressure was lower during the first 6.5 months and rose about 7 mm of Hg. in the last week. Diekmann (1952) also found decreased blood pressure during pregnancy with rise in the last trimester averaging 6 to 7 mm of Hg. in both systolic and diastolic reading. Even in previously hypertensive women Reid

and Teel (1939) found normal pressure during midpregnancy to rise again in the third trimester. Gant *et al* (1980) stated that during pregnancy with the decrease in peripheral resistance of despite a compensatory increase in cardiac output and blood volume, there is a resulting decrease in systemic blood pressure. Kellar (1955) also expressed the same view.

"Normal" blood pressure varies from person to person, so is the dividing line between normotensive and hypertension, Henry (1936) found a general average pressure of 120/67 mm of Hg. for all reading made during pregnancy with a "normal" figure of 120/80 mm of Hg. Brown (1947) put the "normal" blood pressure as 'over 120/80 mm of Hg.' and emphasized the importance of the first reading and the reading must be obtained before 20th week of pregnancy.

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Materials and Methods

Total number of case studied was 350. Only cases with normal pregnancy were studied and each patient had at least 5 readings of blood pressure spreading over the three trimesters of pregnancy. Blood pressure was recorded with sphygomanometer.

Out of 350 cases, 128 were primigravida and 222 were multigravida. Age of the women ranged from 16 to 35 years, average being 23.58 years.

In analysis (a) average systolic, diastolic and pulse pressure of the whole group were computed at different weeks of pregnancy and (b) at different trimesters and were compared with the average pre-pregnancy blood pressure, (c) average systolic and diastolic pressure of the whole group at different weeks of pregnancy were computed for different age group, (d) any deviation of systolic and diastolic pressure from pre-pregnant level were found out.

Results

The average pre-pregnancy blood pressure was 116.58 mm. of Hg. systolic and 76.28 mm of Hg. diastolic (pulse pressure 40.30 mm of Hg.).

Comparing the pre-pregnancy blood pressure with intrapregnancy pressure it was observed that there was a gradual fall of both systolic and diastolic blood pressure from 8 weeks onwards, the nadir of which was attained at 20 weeks of pregnancy. And since then there was steady rise upto 40 weeks. Maximum fall at 20th week in comparison with pre-pregnancy level was 11.5 mm. of Hg. systolic and 11.87 mm of Hg. diastolic and maximum rise at term was 5.88 mm. of Hg. systolic and 2.58 mm. of Hg. diastolic pressure. The lowest average pressure was 107.05 mm of Hg. systolic and 64.41 mm of Hg. diastolic and highest average pressure was 122.46 mm. of Hg systolic and 78.86 mm of Hg. diastolic. Diastolic pressure ranged irregularly in the first trimester but rise from 20th week onwards was small but consistent upto term.

TABLE I
Average Blood Pressure During Different Weeks of Pregnancy

	Blood Pressure		
	Systolic	Diastolic	Pulse Pressure
Pre-pregnancy	116.58	76.28	40.30
Weeks of pregnancy			
6 weeks	116.17	74.89	41.28
8 weeks	113.17	74.26	38.91
10 weeks	115.38	74.69	40.69
12 weeks	115.64	75.64	40.00
16 weeks	110.48	72.35	38.13
20 weeks	107.05	64.41	42.64
24 weeks	115.14	74.56	40.58
28 week	118.38	75.05	43.33
32 weeks	119.29	75.63	43.66
36 weeks	120.75	77.81	42.94
40 weeks	122.46	78.86	43.60
Post partum	118.29	76.71	41.58

Trimester wise blood pressure showed slight fall of both systolic (1.47) and diastolic pressure (2.02) in second trimester and rise in third trimester (systolic—4.24 mm. of Hg. and diastolic 1.07 mm. of Hg).

Influence of Age: No influence of age on the pattern of blood pressure during pregnancy was observed in this study.

Variation of blood pressure: Though average intrapartum blood pressure showed gradual fall in midpregnancy and then rise in the third trimester. Many cases showed no change or gradual rise of systolic or diastolic pressure or both without midpregnancy fall.

No change: Out of total 350 cases, 24

TABLE II
Blood Pressure in Different Trimesters of Pregnancy

Duration of pregnancy	Systolic Pr.	Diastolic Pr.	Pulse Pr.
Pre-pregnancy	116.58	76.28	40.30
1st trimester	116.36	75.40	40.96
2nd trimester	115.11	74.26	40.85
3rd trimester	120.79	77.35	43.44

TABLE III
Blood Pressure in Different Weeks of Pregnancy in Different Age Group

Duration of Pregnancy	15 to 19 Yrs.		20 to 25 Yrs.		26 to 30 Yrs.		31 and above	
	Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic
Pre-pregnancy	115	72.5	117.6	78.4	115.6	75	113.42	72.85
6 weeks	116.42	75.71	117	77.33	115.71	74.28	113.33	73.33
8 weeks	117	76	116.86	75.33	116.66	75.55	117.5	75
12 weeks	114.61	73	117.4	75.5	117.33	73	115	77.5
16 weeks	116.46	75.38	117.03	74.81	118	76.23	113.33	73.3
20 weeks	115.25	74.37	118.23	75.2	116.71	72.42	120	77.5
24 weeks	115.05	73.9	113.9	72.55	114	72.5	116	76
28 weeks	113.68	72.42	116	72.9	115.5	76	118.8	73.8
32 weeks	114.58	73.16	117.79	75.01	117.56	75.09	118	77
36 weeks	116.37	75.31	117.18	75.98	116	75.13	113.63	71.81
40 weeks	118.72	74	120.08	78.87	119.62	78.62	116.66	76.66
Post partum	114	70	113.3	73	114.28	76.57	120	80

TABLE IV
Variation of Blood Pressure in Pregnancy

Age Group in Yrs.	No. of cases	No change %	Only rise of B.P. %	Initial fall then rise %	Only fall of B.P. %
15-19	70	8 (11.42)	20 (28.57)	34 (48.57)	8 (11.42)
20-25	186	10 (5.37)	76 (40.86)	82 (44.08)	18 (9.67)
26-30	74	4 (5.40)	28 (37.83)	30 (40.53)	12 (16.21)
31 and above	20	2 (10)	8 (40)	6 (30)	4 (28.57)
	350	24 (6.85)	132 (37.7)	152 (43.43)	42 (12)

(6.85%) had no change in blood pressure during pregnancy.

Only Rise of Blood Pressure

Only rise of systolic pressure or diastolic pressure or both was found in 132 cases (37.7%). In this group 40.86% were from the age group of 20 to 25 years. Midpregnancy rise was in 60 cases and late pregnancy rise was in 72 cases. Average rise of systolic pressure from pre-pregnancy level was 10 mm of Hg. and that of diastolic pressure was 6 mm. of Hg.

Midpregnancy fall and rise

In this group there were 152 cases (43.43%). Maximum number of cases were in the age group from 15 to 19 years. In 57.9% of cases fall of blood pressure was maximum at 20 to 24 weeks of gestation. Average fall of systolic pressure from pre-pregnancy level was 8 mm of Hg. and that of diastolic pressure was 7 mm of Hg., maximum fall of systolic pressure was 20 mm of Hg. and diastolic pressure was 12 mm of Hg.

In 104 (68.42%) cases blood pressure was elevated at 36 to 40 weeks. In 65 (42.7%) cases both systolic and diastolic pressure were elevated at term above the pre-pregnancy level. In those cases average rise of systolic pressure was 13.4 mm. of Hg. and that of diastolic pressure was 12.2 mm. of Hg.

Only fall of blood pressure

In 42 cases (12%) there were only fall of systolic pressure or diastolic or both. In this group also maximum fall was noted in 20 to 24 weeks, but in few cases continues to fall upto 38th week. Average fall of systolic pressure from pre-preg-

nancy level was 10.9 mm and that of diastolic pressure was 11.8 mm.. of Hg.

Discussion

It is seen from the study of 350 cases that there is 'midpregnancy' drop in average blood pressure and it is the standard clinical teaching. But the typical picture of midpregnancy fall was found in 43.43% of cases only. On the other hand, in 37.7% of cases there was rise of blood pressure.

The average pre-pregnancy systolic blood pressure was 116.58 mm. of Hg. and average diastolic pressure was 76.28 mm. of Hg. This pressure was higher than 114.6/72.6 mm. of Hg. found by Andros (1915) and lower in both systolic and diastolic than the "normal" 120/78 mm of Hg. used by Henry (1936). The average blood pressure started to drop from 8 weeks onwards and maximum was at 20th week. Then there was gradual rise till term. Maximum fall of systolic pressure was 11.53 mm. of Hg. and that of diastolic pressure was 11.87 mm. of Hg. than the pre-pregnant level. But the present criterion for diagnosis of hypertension does not take account of the normal course of blood pressure during pregnancy (Chesley, 1978). And kellar also (1955) emphasized that an abnormal pressure must clearly berelated to the patient's initial pressure and to the stage of pregnancy being considered. Moreover, from review of literature and from the findings of this study it seems that the arbitrary level of blood pressure of 140/90 mm of Hg. as a border line is higher one.

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