A STUDY OF BLOOD-PRESSURE OF THE BABIES BORN OF NON-TOXAEMIC AND TOXAEMIC MOTHERS IN THE NEONATAL PERIOD

by

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It is curious to note that so far very little systematic study has been made to see whether with the increase in maternal blood-pressure in pre-eclamptic toxaemia there is any incidence of raised pressure in the babies born of such mothers. This study was made with the intention to find correlation, if any, between maternal and foetal blood pressure in normal and toxaemic pregnancies.

Blood pressure readings in the new-born babies are difficult to record and standardise accurately. It is necessary to have the infant at rest; auscultation of the brachial artery is not practicable by the ordinary method, and palpation of the radial pulse is often difficult. The width of the cuff used introduces a further variable factor.

A review of literature shows various attempts that have been made to estimate average blood pressure of the neonatal babies. Rucker and Connell (1924) used an Oscillometer for determination of blood pressure. They did not state the width of the cuff they used. Woodbury et al (1938) measured the blood pressure at birth with a canula in the umbilical artery. They found that the readings corresponded with those obtained by palpation at the wrist when a 2.5 cm. cuff was used. Day (1939) investigated the effect of cuff-width in children and adults. He found that by widening the cuff the blood pressure reading might be lowered until a certain point was reached, after which the reading remained constant. He concluded that the wider the cuff the more reliable was the result. Smith (1945), quoting Woodbury et al, states that a 2.5 cm. cuff must be used.

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Method and Material

In the present investigation a 2.5 cm. cuff was used and the systolic pressure only was read by palpation of the radial artery at the wrist. A cuff of such a small width is not ordinarily available, and had to be specially designed for the purpose, by trial. Estimation of the diastolic pressure of the new-born babies was not possible by palpation. Auscultatory method was tried but was of no help in determining both systolic and diastolic pressure. Difficulty was often encountered in feeling the radial pulse, but not impossible. All readings were made with the infant quiet, but very few during sleep. In twenty-five babies of the control

group, and a similar number in the pre-eclamptic toxaemia of different grades, daily readings of systolic pressure were made for the first eight days of neonatal life. The mother's blood pressure was also checked at the same time.

Analysis of Results

In the present investigation, the average systolic pressure on the first day was 51.40 ± 2.528 mm. of Hg. in the toxaemic group, and 50.12 ± 1.842 mm. of Hg. in the control group.

On the eighth day it was 81.08 ± 1.107 mm. of Hg. in the former group, and 79.68 ± 1.087 mm. of Hg. in the latter group. In both the groups, the blood pressure had a tendency to rise during the first eight days but the rise was not a steady one. Several infants in the control group showed initial fall in blood pressure, but same findings were observed in the toxaemic group also.

The distribution of readings of blood pressure at the beginning and the end of the period of 8 days is almost identical in both the groups. The results of statistical analysis of the systolic blood pressure of the control and toxaemic babies are given in Tables 1 to 4.

TABLE 1
Systolic Blood-Pressure of Babies Born of Normal Mothers

	Mean	mm. of Hg. standard error
1st day reading	50.12	1.842
8th day reading	76.68	1.087
Difference between means	29.56	
't'	26.925	
(highly significant)		

TABLE 2
Systolic Blood-Pressure of Babies Born of Toxaemic Mothers

	Mean	mm. of Hg. standard error
1st day reading	51.40	1.528
8th day reading	81.08	1.197
Difference between means	29.68	
't'	26.93	
(highly significant)		

TABLE 3
Systolic Blood-Pressure of Normal and Toxaemic Babies—First Day

	Mean	mm. of Hg. standard error
Normal baby	50.12	1.842
Toxaemic baby	51.40	1.528
Difference between means	1.28	
't'	0.737	
(insignificant)		

TABLE 4
Eighth Day Systolic Blood Pressure of Normal and Toxaemic Babies

	Mean	mm. of Hg. standard error
Normal baby	79.68	1.197
Toxaemic baby	81.08	1.087
Difference between means	1.40	
't'	0.842	
(insignificant)		

Discussion

The findings of the systolic blood pressure in new-born babies on the first day were practically the same in both toxaemic and control groups. The average eighth day readings were also almost the same in the two groups.

Browne and Dodds (1936) in three typical and representative cases

of pre-eclamptic toxaemic and hypertensive diseases with pregnancy reported that there was no rise of blood pressure in the new-born babies born to toxaemic mothers.

It might be supposed that if the cause of hypertension in pre-eclamptic toxaemia is due to hormonal imbalance or some circulating toxin in the mother's blood, these agents would diffuse through the placenta to the foetal circulation and that the infant would then suffer from the effect of raised blood pressure at birth. In the present investigation this assumption is not statistically tenable.

It is, therefore, concluded that whatever may be the cause of hypertension in pre-eclamptic toxaemia, it is not a substance that is capable of passing across the placenta into the foetal circulation thereby raising the blood pressure of the new-born babies.

References

1. Browne F. J. & Dodds G. H.: Lancet; 1, 1059, 1936.
2. Day R.: Jour. Pediat.; 14, 573, 1939.
3. Rucker M. P. & Connel J. W.: Amer. Jour. Dis. Childhood; 27, 6, 1924.
4. Smith C. A.: The Physiology of the New-born Infants; Springfield, Charles C. Thomas.
5. Woodbury R. A., Rainbow M. & Hamilton W.: Amer. Jour. Physiol.; 122, 472, 1938.