

MATERNAL ANAEMIA AND THE FOETUS

by

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Severe anaemia constitutes a major risk to the gravid patient. It would seem reasonable to expect that the disease dangerous to mother would also threaten the life and well-being of the foetus. Indeed most clinical experience suggests a high perinatal loss with severe anaemia complicating pregnancy. Noteable among these are that of Upadhyay (1944) who found increased number of premature births amongst severely anaemic mothers. Dasgupta (1954) found a good degree of direct correlation between macrocytosis and premature labour. Numerous authors have commented on the relationship of social class to the neonatal death and stillbirth rate (Woolfe, 1947; Morris and Heady, 1959). They proved that wastage from all causes is lower in social class I and II than in III and IV. Krishna Menon (1965) noted high incidence of premature births in anaemia complicating pregnancy. Johnson (1967) noted increased stillbirth and premature births in severe anaemia of pregnancy, while Rowland (1933) and a number of other authors have brought forward the controversial view that anaemia does not affect the foetal development.

This analysis has been done in a fairly large series of patients to see the effect of anaemia on the foetal growth.

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Material and Method

The cases attending the Labour Room and Antenatal Clinic of Patna Medical College Hospital, have been analysed in this report. The total number of cases are 200; 150 cases with haemoglobin level below 10 gm. per 100 ml. were taken as anaemia in pregnancy; 100 cases had haemoglobin between 6 to 10 gm. per 100 ml. and 50 cases had haemoglobin below 6 gm. per 100 ml. The age ranged from 15-39 and parity ranged from first to 8th gravida. Graph I shows the incidence of

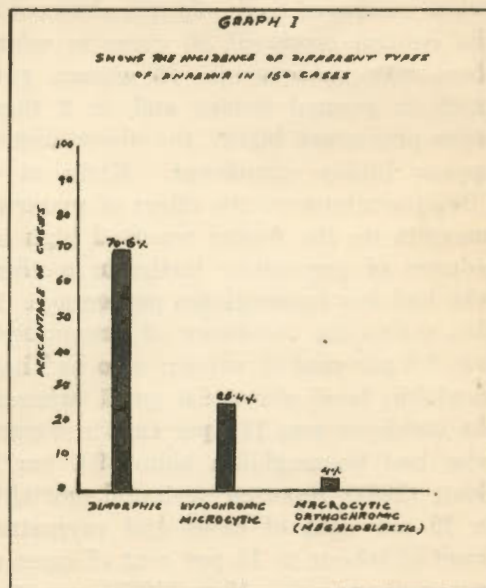


Fig. 1.

different types of anaemia in 150 cases; 70.6 per cent are dimorphic type while

25.4 per cent hypochromic microcytic and only 4 per cent are macrocytic orthochromic (Megaloblastic). Complete haemogram was done in each case to differentiate the type of anaemia. In some cases confirmation of the type of anaemia was made by corroboration from bone marrow biopsy.

Discussion

The results of the present study generally support the concept that anaemic state in the mother does affect the state of the foetus as far as its growth and development are concerned. Out of 150 pregnant mothers studied, 109 gave birth to a normal baby and in the rest there was evidence of early foetal loss, stillbirth, prematurity or congenital malformation. Six women had abortions, 27 gave birth to premature babies, in 7 there was stillbirth and in only one case there was congenital malformation (Table 1). When compared to the figures obtained in the control group of 50 cases in whom there was no anaemia, 48 women gave birth to normal babies and in 2 there were premature births, the above figures appear highly significant. Klein *et al* (1962) working on the effect of maternal anaemia on the foetus reported high incidence of premature births in mothers who had low haemoglobin percentage. In this series the incidence of prematurity was 7.6 per cent in women who had haemoglobin level above 9.6 gm.% whereas the incidence was 13.8 per cent in women who had haemoglobin below 9.6 gm.%. Scott (1961) reported perinatal mortality in 10 per cent of cases and premature onset of labour in 11 per cent of cases of maternal anaemia. Vyas (1969) reporting on the outcome of pregnancies in 101 cases of severe anaemia, observed that out of 42 deliveries in the hospital 2 had abortion, 3 stillbirth, 33 were premature

babies and only in 4 cases the babies were normal. In the present series 50 cases of severe anaemia were studied, out of which, in 8 per cent of cases there were abortions, 44 per cent gave birth to premature babies, 10 per cent stillbirths and 2 per cent of babies were born with congenital malformation (Table I).

Davis (1963) found a very high level of foetal mortality as well as maternal mortality in cases of severe anaemia. Donald (1969) also noted increased incidence of prematurity, stillbirth and neonatal death rate in cases of severe maternal anaemia. Upadhyay (1944) also found markedly frequent incidence of premature births in cases of pregnancy associated with severe anaemia.

Table II shows the outcome of pregnancy in different types of anaemia. There were 106 cases of dimorphic anaemia in the present series, out of which 71.69 per cent of women had normal babies after full length of gestation, the rest 28.3 per cent of women had one or other type of foetal abnormalities. This included abortions in 3.79 per cent of cases, prematurity in 19.83 per cent of cases, stillbirths in 3.77 per cent of cases and one baby (0.94 per cent) was born with congenital malformation. Dasgupta (1954) reporting on the effect of macrocytic anaemia on the foetus found 30 per cent of neonatal deaths in this group as compared to 20 per cent in cases of microcytic and normocytic anaemia. Callendar (1944) carried out similar study on 25 cases of macrocytic anaemia during pregnancy and found that 6 (24 per cent) had premature births, in one case (4 per cent) there was a stillbirth, in one (4 per cent) there was death of foetus in utero and in another case the baby died immediately after birth.

Analysis of 38 cases of microcytic hypochromic type of anaemia in the present

TABLE I
Shows outcome of pregnancies with relation to severity of anaemia

Type of anaemia	No. of cases		Abortion		Normal		Premature		Stillbirth		Congenital malformation	
	No. of cases.	per-centage.	No. of cases.	per-centage.	No. of cases.	per-centage.	No. of cases.	per-centage.	No. of cases.	per-centage.	No. of cases.	per-centage.
Mild and moderate anaemia	100		2	2	91	91	5	5	2	2	—	—
Severe anaemia	50		4	8	18	36	22	44	5	10	1	2
Total	150		6	..	109	..	27	..	7	..	1	..

This table shows that the maximum number of abortions, prematures and stillbirths was recorded in the severe anaemia with pregnancy, than mild and moderate type of anaemia with pregnancy.

TABLE II
Shows outcome of pregnancies with relation to types of anaemia

Types of anaemia.	No. of cases		Abortion		Normal		Premature		Stillbirth.		Congenital malformation.	
	No. of cases.	per-centage.	No. of cases.	per-centage.	No. of cases.	per-centage.	No. of cases.	Per-centage.	No. of cases.	Per-centage.	No. of cases.	Per-centage.
Microcytic hypochromic	38		1	2.6	31	81.55	5	13.15	1	2.6	—	—
Dimorphic	108		4	3.77	76	71.69	21	19.83	4	3.71	1	0.94
Microcytic orthochromic (Megaloblastic)	6		1	16.7	2	33.3	1	16.7	2	33.3	—	—
Total	150		6	—	109		27		7		1	

This table shows that the maximum incidence of abortions and stillbirths were found in the megaloblastic type of anaemia whereas the minimum in the microcytic hypochromic type of anaemia.

series reveals that 81.55 per cent of cases had normal delivery with the birth of healthy babies. When compared to the normal control of 96 per cent healthy babies this figure is still fairly significant. In the rest, 18.15 per cent of all, there was abortion in 2.6 per cent, prematurity in 13.15 per cent of all cases and stillbirth in 2.6 per cent of cases (Table II). Steingold (1962) reported that there is increased frequency of abortion and asphyxia neonatorum in the cases of hypochromic microcytic type of anaemia. From the results of the present series as well as from those of Steingold (1962) and a comparison of these results with the normal control it will be quite logical to conclude that even normal microcytic hypochromic anaemia in pregnancy in severe cases can have a disturbing effect on the foetal well-being.

In this series there were 6 cases of megaloblastic anaemia; one aborted (16.7%), 2 (33.3%) delivered normally at full term, 1 (16.7%) had a premature delivery and 2 (33.3%) had stillbirth.

A comparative study of these three types of anaemia in pregnancy shows significant and injurious effect of anaemia on the growing foetus.

In cases of megaloblastic anaemia, the disturbances in the foetal growth became very high. Next in frequency is dimorphic anaemia where also the incidence of foetal abnormality is significant. The majority of megaloblastic anaemia in pregnancy is due to folic acid deficiency. At present it has been established beyond doubt both in experimental animals and pregnant women that induced folic acid deficiency has a marked adverse effect on the foetus in the form of defective intra-uterine growth, prematurity, brain damage and mental retardation.

Therefore, it is quite logical to conclude from the above results that anaemia, par-

ticularly megaloblastic type of anaemia, should not be considered only a disease concerning the mother without any deleterious effect on the foetus. Prophylactic therapy for anaemia in pregnant women is essential both for the well being of the mother and the foetus.

Summary

One hundred and fifty cases of anaemia of pregnancy of varying grades were studied to find out the effect of anaemia on the growing foetus.

An analysis of outcome of pregnancy in different types of anaemia revealed that dimorphic variety had exerted injurious effects on the foetus in maximum number of cases.

In hypochromic microcytic type the effect on the foetus was abortion 1 (2.6%), premature delivery 5 (14.5%) and stillbirth 1 (2.6%).

In dimorphic type the effect on foetus was abortion 4 (2.6%), premature delivery 21 (19.83%), stillbirth 4 (3.77%) and congenital malformation 1 (0.94%).

In megaloblastic type the effect on the foetus was abortion 1 (16.7%), premature delivery 1 (16.7%) and stillbirth 2 (33.3%).

The effect of anaemia on the foetal morbidity and mortality was maximum in severe types of anaemia and less marked in mild and moderate degree of anaemia.

In the severe cases the percentage of overall effect on foetus was 32 (64%) and only 9 (9%) in the mild and moderate degree of anaemia.

The 32 (64%) in severe degree include abortions 4 (8%), premature births 22 (44%), stillbirths 5 (10%) and congenital malformation 1 (2%) of infants.

The 9 (9%) cases in mild and moderate degree of anaemia include 2 (2 per

cent) abortions, premature births 5 (5%) and stillbirths in 2 (2%) of cases.

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