Hematological values in pregnancy in Orang Asli (Aboriginal) women

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THE CONCEPT OF "physiological anemia in pregnancy" stems from the fact that in pregnancy, a greater increase in plasma volume as compared to increase in red cell volume leads to hemodilution. Therefore there is seen a gradual and progressive fall in hemoglobin values as pregnancy advances; this fall is preventable by providing hematinic supplements to the pregnant mother. *Kwa and Ko*[1] in Singapore, studying 1,000 antenatal mothers, found a fall in the mean hemoglobin level from the 9th week to the 36th week of gestation, with a rise after that till term. A similar trend was observed with the hematocrit (PCV) and mean corpuscular hemoglobin concentration (MCHC). Other authors have found similar trends[4,5].

A knowledge of these hematological values and trends in a rural population would prove useful towards management of pregnant mothers and planning of maternal health services. A study was carried out in the Orang Asli (aboriginal) Hospital, Gombak, Selangor, to study the hemoglobin level, PCV and MCHC values in pregnancy in Orang Asli women, basically a rural population; and the influence of gravidity and location of settlements upon these values.

Materials and Methods

The Orang Asli Hospital, Gombak, being the only hospital for Orang Aslis (Aborigines) in Malaysia accepts patients from all over West Malaysia. The obstetric unit, being in its early stages, sees mainly normal pregnant mothers, brought in to accustom the Orang Asli women to hospital care and delivery.

A total of 278 pregnant mothers, seen at their first antenatal visit from 18.6.71 to 2.6.72, were included in the survey. Venous blood was drawn from each patient for determination of hemoglobin,

Table I. Mean Values and Standard Deviations for Hemoglobin, PCV and MCHC in Pregnancy in Orang Asli women with relation to Gestational Period.

Gestation in weeks	No. of patients	Mean HB Gm%	S.D.	Mean PCV%	S.D.	Mean MCHC%	S.D.
0—	—	—	—	—	—	—	—
4—	1	11.3	—	35.0	—	32.0	—
8—	1	11.2	—	34.0	—	33.0	—
12—	1	13.2	—	41.0	—	32.0	—
16—	4	11.2	1.99	33.0	3.24	33.7	1.09
20—	18	11.4	1.36	34.6	3.81	33.0	1.54
24—	27	10.6	2.05	32.6	5.44	32.2	1.83
28—	55	10.9	1.81	33.4	5.40	32.1	1.89
32—	77	10.5	1.99	32.7	4.68	31.8	2.25
36—40	94	11.3	1.68	35.0	4.74	32.1	1.64
Overall	278	10.9	5.97	33.8	5.02	32.1	2.26

PCV and MCHC values. The hemoglobin was determined by the cyanhemoglobin method, using the spectrophotometer, and the PCV by the microcapillary technique.

Broadly, Orang Aslis can be divided into two groups, the deep jungle population and the "outside" population consisting of the jungle fringe settlements and those near towns or villages. This was done for Table III.

Results

Table I shows the relationship of mean values for hemoglobin, PCV and MCHC to gestational periods. There is a suggestion that after the 20th week, the hemoglobin falls till the 36th week after which there is a rise till term. There is, however, no similar trend in PCV and MCHC values.

The overall values for hemoglobin, PCV and MCHC are fairly low, being 10.9 Gm%, 33.8% and 32.1% respectively; with ranges of values from 4.1 to 17.7 Gm%, 14.0 to 56.0% and 25.0 to 36.0% respectively.

In *Table II*, there is suggestion of a fall in hemoglobin values with increasing parity, the mean for primigravida being 11.5 Gm% compared as to 10.7 Gm% for para 5 and above. Corresponding values for PCV are 35.2% and 33.0%, and for MCHC 32.4% and 32.1%. In the survey, 162 mothers (58.3%) were para 1 to 4, and 116 mothers (41.7%) were para 5 and above.

Table III shows that the mean values for hemoglobin, PCV and MCHC are correspondingly lower in the "outside" population, these values being 10.8 Gm%, 33.5% and 32.1% respectively. The respective values for the deep jungle population were 11.8 Gm%, 35.6% and 32.3%.

In the survey, 71 out of 278 pregnant mothers had hemoglobin values less than 10.0 Gm%, the level at which anemia in pregnancy is taken to be present[3]. The prevalence of anemia in pregnancy in Orang Asli women seen at their first antenatal visit is thus 25.5%. Only one of these 71 patients was from the deep jungle population.

Discussion

Kwa and Ko[1] found a gradual and progressive fall in the hemoglobin, PCV and MCHC values as pregnancy advances. The author is unable to establish similar trends in the present study. This could be related perhaps to the relatively small number of pregnant mothers in the study. However, there is a suggestion of a fall in hemoglobin

Table II. Mean Values and Standard Deviations for Hemoglobin, PCV and MCHC in Pregnancy in Orang Asli women with relation to Gravidity.

Gravidity	No. of patients	Mean HB Gm%	S.D.	Mean PCV%	S.D.	Mean MCHC%	S.D.
1	55	11.5	1.66	35.2	4.78	32.4	1.57
2	45	10.9	1.71	33.7	4.53	32.2	1.00
3	34	10.8	2.48	33.5	6.76	31.5	2.07
4	28	10.9	1.59	32.9	3.81	32.4	1.60
5 and above	116	10.7	1.86	33.0	4.78	32.1	1.65

Table III. Mean Values and Standard Deviations for Hemoglobin, PCV and MCHC in Pregnancy in Orang Asli women with relation to location of settlements.

Location of settlements	No. of patients	Mean Gm%	S.D.	Mean PCV%	S.D.	Mean MCHC%	S.D.
Deep Jungle	37	11.8	1.50	35.6	4.37	32.3	1.82
'Outside' Jungle	241	10.8	1.85	33.5	5.10	32.1	1.92

values from the 20th to 36th week of gestation.

Mean values of hemoglobin, PCV and MCHC in the overall figures are considerably low, being 10.9 Gm%. 32.8% and 32.1% respectively. This would respectively suggest a mild degree of iron-deficiency anemia in the average pregnant Orang Asli woman. In this context then, the practice of giving supplementary oral iron to pregnant mothers is well justified.

Increasing parity is known to be related to anemia in pregnancy. The Orang Asli woman is no exception. This relationship is suggested in Table II. In the Orang Asli women, babies are born close to one another within the same family, leaving little time for any pre-anemic or anemic state to correct itself before the next pregnancy. The body stores of iron are therefore depleted without any adequate replacement.

Differences in hematological values between deep jungle and "outside" jungle populations could be related to problems of migration out of the jungle to the fringes and to settlements near villages or towns. Migration creates a change of living habits and change in purchasing values. The usual hunting and fishing for food or cultivation of the land for food gives way to having to work for a living, to earn money to buy food. Being in the lower socio-economic group, the Orang Aslis can afford to spend very little money on food and this leads to insufficient nutrition, especially of proteins and minerals. There is thus a tendency towards under-nutrition and anemia, especially so in the pregnant mother. Migration therefore creates its own problems[2].

It is convenient to attribute such problems to migration but further investigations will have to be done to establish such a relationship. If this relationship was true, then something can be said for leaving the Orang Aslis in the deep jungle rather than to re-settle them outside the jungle, as is being done to exploit available natural resources.

Summary

From the present study of 278 pregnant Orang Asli women seen at their first antenatal visit, the following points can be raised:

(i) The general trend of falling hemoglobin. PCV and MCHC values with advancing pregnancy is not clearly established in the Orang Asli.

(ii) The mean values for hemoglobin, PCV and MCHC are 10.9 Gm%, 33.8% and 32.1% respectively.

(iii) Increasing parity is no doubt a factor in development of iron-deficiency anemia in pregnancy,

(iv) The differences in hematological values in pregnancy between deep jungle and "outside" jungle populations could be related to problems of migration.

(v) The prevalence of anemia in pregnancy in Orang Asli women is 25.5%.

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References

1. Kwa, S.B., and Ko, M., (1968), Sing. M.J., *Hemoglobin Values in Pregnancy*, 9:27-30.
2. Dr. J.M. Bolton, Personal Communication.
3. *Lancet* leading article. (1963), *Pregnancy and Anemia*, 1:309.
4. Macfarlane, J., (1964), Med. J. Aust., *Hemoglobin values during Pregnancy*, 2:502-3.
5. Paintin, (1962), J. Obst & Gynec. Brit. Comm., *Significance of Total Red Cell Volume in Pregnancy* 69:719.