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Anaemia in Twin Pregnancy

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A total of 123 twin pregnancies were studied, 68 by records analysis only, and 55 by serial haematological assessment in detail. The incidence of low haemoglobin levels is found to be greater than in singleton pregnancy; evidence of iron and folic acid deficiency is common in sternal marrow aspirates but not in peripheral blood films. Routine haematinic prophylaxis in twin pregnancy is not advocated.

Key words: Anaemia, Iron deficiency, Folic acid deficiency, Twin pregnancy

INTRODUCTION

Standard obstetric texts agree that anaemia due to iron or folic acid deficiency is more common in twin than in singleton pregnancy, and that routine iron and folic prophylaxis is therefore necessary. We have not been able to find any published evidence that anaemia is more common, or that haematinic prophylaxis is beneficial. Research on this subject is difficult in most parts of Britain since routine iron and folic acid prophylaxis is already being given to most pregnant women. However, such supplements are not usually given to pregnant women in Aberdeen, because research studies have cast doubt upon the value of such treatment with iron [8] or folic acid [2]. Preliminary studies in Aberdeen [5] had suggested that the serum folate and the total serum folate fall more in twin than in singleton pregnancy, but numbers were small and it was, therefore, decided to look at the haematology of twin pregnancy more closely, in this mainly untreated population.

METHODS

The records were scrutinised of all 123 twin pregnancies identified in the Grampian Health Board Area from February 1975 until May 1977 inclusive, during which period there were about 12,000 births. Sixty-eight cases (26 primiparae and 42 multiparae) had records analysis only, mainly because they lived in rural areas or were diagnosed late. A cohort of 55 women (26 primiparae and 29 multiparae), who lived in Aberdeen and were booked for confinement in Aberdeen Maternity

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Hospital, were interviewed at the antenatal clinic as soon as the diagnosis of twin pregnancy was made, and agreed to take part in an intensive serial study, in which the following measurements were made at 20–23 weeks' gestation, 24–27 weeks, 28–31 weeks, 32–35 weeks, 36–37 weeks, and 38–40 weeks:

Erythrocyte sedimentation rate (ESR) was measured by the Westergren method.

Peripheral blood profile was obtained by a Coulter counter (model S), within four hours of venepuncture. Blood films prepared in the laboratory were fixed and stained automatically by a Haematek slide stainer.

Serum B_{12} levels were assayed microbiologically with Lactobacillus leichmanii (NCIB 8118) by the method of Spray [9].

The *serum folate* and *red cell folate* were also assayed microbiologically with Lactobacillus casei (NCIB 8D10) by the methods of Waters and Mollin [10] and Hoffbrand et al [6], respectively.

Plasma volume was calculated by the method of Hytten and Paintin [7].

Total serum folate was calculated by multiplying the plasma volume (ml) by the serum folate concentration (ng/ml).

Sternal marrow aspirations, performed between 32 and 34 weeks' gestation in 27 women who agreed to this, were reported by one of us (RJLD). Megaloblastic haemopoiesis was graded as absent or present (grades 1–4), and stainable iron was assessed.

None of the 55 women in the intensive study were given folic acid, although some were given iron after iron deficiency was diagnosed. Some of the 68 women with records analysis had been given iron and folic acid only after anaemia was diagnosed.

RESULTS

Detailed results, from the intensive serial study, of mean levels of ESR, PCV, MCHC, MCV, WCC, RCC, serum B_{12}, serum folate, red cell folate, plasma volume, and total serum folate, are to be published elsewhere.

Haemoglobin Levels (Hb)

In the intensive serial study it was found that the mean Hb level did not fall with gestation (Table 1) after 20 weeks. In the overall study, the number of twin pregnancies in which the Hb level fell below 10 g/dl at 30 and 36 weeks' gestation, is compared in Table 2 to the number in singleton pregnancies untreated by folic acid described by Hall [2]. At 30 weeks' gestation more of the twin pregnancies had a Hb < 10 g/dl, but at 36 weeks there was no significant difference.

In all the twin pregnancies it was found that the Hb was < 10 g/dl at any time in 24%, < 9 g/dl in 9%, and < 8 g/dl in only 3%.

TABLE 1. Mean Haemoglobin in Twin Pregnancy by Gestation

Gestation (weeks)	N	Mean Hb (g/dl)	SD
20–23	13	10.4	1.1
24–27	15	10.1	1.7
28–31	29	10.4	1.4
32–34	26	10.9	1.2
36–37	16	10.5	3.1
38–40	13	11.8	1.1

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TABLE 2. Proportion of Singleton and Twin Pregnancies With Haemoglobin Less Than 10 g/dl

	At 30 weeks' gestation			At 36 weeks' gestation		
	N	< 10 g		N	< 10 g	
Singletons	1,910	308	(16.1%)	1,599	247	(15.4%)
Twins	73	15	(20.5%)	60	10	(16.7%)

TABLE 3. Macrocytosis in Singleton and Twin Pregnancy

	Definite macrocytosis			Equivocal macrocytosis	
	N	n	%	n	%
Singletons	2,024	38	1.9	106	5.2
Twins	123	3	2.4	5	4.1

TABLE 4. Profiles of Twin Pregnancies With Megaloblastic Haemopoiesis

Patient	Marrow grade	Macrocytosis in peripheral blood film	Hb	Red cell folate
Mrs. E.	1	–	Low[a]	–
Mrs. I.M.	1	Normal	Normal	Low
Mrs. B.	1	Normal	Normal	Low
Mrs. K.	2	–	Normal	Low
Mrs. L.M.	2	Marginal	Normal	Normal
Mrs. A.	3	Normal	Low	Low
Mrs. C.	3	Definite	Normal	Low
Mrs. F	3–4	Definite	Normal	Low

[a]"Low" results are less than one standard deviation below the mean at that gestation.

Iron Deficiency

Of all twin pregnancies, 18 (15%) had definite evidence of hypochromia on peripheral blood film scrutiny, whereas eight (7%) had equivocal changes. Of the 27 women in the intensive study who had sternal marrow aspiration, 11 (40%) showed absent or reduced iron storage.

Folic Acid Deficiency

Table 3 shows that the percentage of all twin pregnancies with macrocytosis and/or neutrophil nuclear hypersegmentation in the peripheral blood film is not significantly greater than in singleton pregnancies untreated by folic acid [2].

Sternal marrow aspiration showed megaloblastic haemopoiesis in eight (29.6%) of 27 twin pregnancies in the intensive study. This is higher than the level (13%) recorded in a study of singleton pregnancies [1] where folic acid was not prescribed. Profiles of the eight patients with megaloblastic haemopoiesis are shown in Table 4.

It should be noted that, at the time of sternal marrow examination, only a minority of the women with megaloblastic haemopoiesis had significant anaemia, two had definite macrocytosis, four had neutrophil nuclear hypersegmentation, and only one had a raised mean cell volume. However, most showed deficient folate stores as defined by a low red cell folate.

DISCUSSION

A low Hb level was found in a greater proportion of twin than singleton pregnancies, but this is likely to be due mainly to the greater plasma volume expansion in multiple pregnancy and thus is of doubtful clinical significance. Only 15% showed presumptive evidence of iron deficiency on peripheral blood film examination, although 40% showed deficient iron stores in the sternal marrow. Whereas only 2.4% had macrocytosis in the peripheral blood film (similar to the incidence in untreated singleton pregnancy), almost 30% showed megaloblastic haemopoiesis on marrow examination.

Despite the evidence of iron and/or folic acid deficiency in the sternal marrow of twin pregnancies at 32–34 weeks' gestation, the incidence of clinically significant anaemia was low, which may be explained by the transient and self-limiting nature of the deficiencies. We do not practise routine iron or folic acid prophylaxis in twin pregnancy, preferring to give specific treatment only if iron or folic acid deficiency is accompanied by significant anaemia. Any adverse effect of folic acid deficiency on pregnancy complications other than anaemia, and any benefits of prophylaxis remain to be established [3, 4].

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