

therapy of 2.5 G. terramycin. The results suggest that the course and recurrence rate of herpes simplex is favourably influenced, and that in herpes zoster many cases run a shorter and far less painful course.

We feel this pilot study should be followed by more extensive trials.

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THE TREATMENT OF IRON-DEFICIENCY ANAEMIA OF PREGNANCY

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IT IS GENERALLY RECOGNIZED THAT the treatment of iron-deficiency anaemia of pregnancy presents special problems to the general practitioner and these notes are the result of a study made of the problem following an evaluation carried out with a new preparation of ferrous sulphate administered as a slow-release tablet. Assessment of the efficacy of such preparations during pregnancy is made difficult by the haemodilution which occurs, and estimates of haemoglobin concentration will only give a rough indication of the degree of anaemia. For this reason, MCHC readings were made in all cases, the accepted normals being 34.2 per cent between the 10th and 15th week of pregnancy, 32.9 per cent between the 26th and 35th week and 32.5 per cent between the 36th week and full term. On these criteria it will be seen from the tables that, though initially below normal, in the majority of cases, satisfactory haemoglobin concentrations were attained and were thereafter well maintained on oral iron therapy. The incidence of side-effects experienced with the preparation used, Ferro-Gradumet, at a dosage of one tablet daily, was low.

Pregnancy imposes a substantial burden on the female. In contrast to the iron requirements of about 336 mg. over an equivalent period when non-pregnant, the pregnant female must mobilize about 550 mg. of iron. These increased requirements are largely limited to the last six months

for, during the first trimester, the absence of menstruation more than makes up for the 5 mg. of iron assimilated by the foetus and for the slight increase in blood volume. In the second trimester, maternal blood volume increases, and this increase persists through most of the third trimester. It is probable that some increase in total red cell mass does occur and this has been estimated to be equivalent to 200 mg. of red cell iron for the purpose of calculation. In the second trimester, therefore, the iron requirements can be summarized as follows:

Iron for excretion	..	..	..	..	..	..	55 mg.
Increase in red cell mass	..	..	..	..	..	..	132 mg.
Foetal requirement	..	..	..	..	..	..	75 mg.
							<hr/> 262 mg. <hr/>

In the final trimester requirements are:

Iron for excretion	..	..	..	..	..	..	55 mg.
Increase in red cell mass	..	..	..	..	..	..	67 mg.
Foetal requirement	..	..	..	..	..	..	200 mg.
							<hr/> 322 mg. <hr/>

Losses at birth due to:

Bleeding at delivery and iron deposited in the placenta	..	125 mg.
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On the credit side, between 100 and 140 mg. is made available to the mother again as the red cell mass decreases to normal in the post-partum period. From these calculations it is evident that the total amount of iron invested in pregnancy is approximately 400 mg., three-quarters of which is taken up by the foetus. Following delivery an additional source of iron loss of perhaps 0.5 mg. daily may occur during lactation, although this may be counterbalanced by the fact that amenorrhoea is usual.

From the above figures the amounts of iron that must be absorbed daily on a trimester basis may be estimated at 0.6 mg. in the first trimester, 2.8 mg. in the second and 3.5 mg. in the third. Ingested iron is absorbed in the ferrous form largely by the duodenum. The absorbed iron passes through the mucosal cells into the blood stream where it is bound by a beta-1 globulin of the plasma. Normally about 90 per cent of this iron is incorporated into the haemoglobin and is found in the circulating red cell mass within two to three weeks; in iron-deficiency anaemia, absorbed iron may be almost quantitatively recovered from circulating erythrocytes. Since foetal requirements of iron are met regardless of the status of maternal iron stores, it is apparent that any degree of iron deficiency in mother and foetus will be reflected quantitatively in the maternal red cell mass. Since the plasma volume always increases during pregnancy, any limitation of red cell production leads to an exaggerated fall in haematocrit reading. Anaemia during early pregnancy indicates a pre-existing iron deficiency whereas its development during the latter half can be attributed to the needs of the foetus. The aim of treatment should therefore be to correct any existing iron deficiency and to build up the body store of iron in addition to supplying a supplement for the needs of the foetus. In practice this may be limited by the gastro-intestinal upset which many

TABLE I
SECOND TRIMESTER

Case No.	Age	Initial	2w	4w	6w	8w	10w	Remarks and side-effects
1	19	60 28.6	64 29.4	62 30	68 31	72 32	79 32.3	Nil
2	28	65 26.6	70 28	76 28.4	80 31.2	78 32	79 33	Nil
3	26	63 28.6	74 29.5	80 32	76 28.4	76 29.5	80 30.6	Nil
4	27	70 26.4	72 28.6	74 28	72 29.2	72 30	76 31	Nil
5	19	70 29.2	74 31	78 31.2	80 32.4	77 32	78 31.8	Nil
THIRD TRIMESTER								
6	17	65 29.2	68 30	70 31.2	68 31.6	74 32	78 32	Complained of some degree of nausea
7	27	65 29.2	65 29.8	70 30	76 30.8	76 31	80 32.6	Complained of some degree of nausea
8	27	70 29.2	72 30	74 30.2	78 32	84 32.6	82 33	No complaints
9	33	70 29.2	71 30	74 30.2	76 31.2	74 30	76 31	Complained of constipation
10	31	70 29.4	72 29.2	71 29	74 30	72 29.6	76 31.2	Complained of some degree of nausea
11	20	78 33	74 31.2	70 30	65 28.8	68 30.2	72 32.6	Parenteral iron in place of Ferro-Gradumet from 6th week onwards
12	25	82 32.6	80 32	80 32.2	76 30	72 29	68 28.8	Parenteral iron given from 6th week onwards

patients experience when taking iron preparations. These upsets are further aggravated during the early months of pregnancy by morning sickness, and a preparation which is both well absorbed and is associated with a low incidence of gastric irritation therefore offers considerable advantages. In the small series of patients under my care, none of the group treated with Ferro-Gradumet in the early months of pregnancy complained of gastro-intestinal side-effects and all showed an adequate response to treatment when judged by MCHC which, with one exception, was over 30 per cent following a ten-week course of treatment. The latter patient (case 12) showed a pronounced fall in both haemoglobin concentration and MCHC at about the 36th week, and in view of this was transferred to parenteral iron therapy. As will be seen from the table of results, her haemoglobin and MCHC readings continued to fall although remaining within extreme normal limits up to parturition. One other patient (case 11) received parenteral iron from 32nd week till term, showing a slight improvement in both haemoglobin and MCHC readings.

Although this was necessarily only a small-scale trial, the results indicate that adequate iron supplementation during pregnancy can be maintained by the administration of one tablet daily of the controlled release ferrous sulphate tablet Ferro-Gradumet, containing 105 mg. elemental iron, and that parenterally administered iron is rarely indicated.

The figures quoted in the text are taken from *Iron metabolism* by T. H. Bothwell and C. A. Finch and Dieckman and Wegner *Arch. intern. med.* 1934, 53:71, 188, 353.

IRON-DEFICIENCY ANAEMIA

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ANAEMIA IS A COMMON CAUSE of morbidity in general practice.^{1 2 3} Fry⁴ recorded all the cases in his practice presenting with the signs of anaemia and in whom the diagnosis was confirmed. His incidence was 17.5 per 1,000.

On the basis of these figures, the average general practitioner with a list of 2,500 would probably treat 43 new cases a year and more if he adopted screening procedures.

Of Fry's cases, 80 per cent were female and 20 per cent were male and of the total 90 per cent were iron deficient. In the male cases, a far higher proportion was demonstrated to have an underlying disease (44 per cent as opposed to 17 per cent females). The female cases were mainly due to negative iron balance. Iron-deficiency anaemia can usually be corrected by giving oral iron. Parenteral iron is only necessary where the iron stores