USEFULNESS OF LOW DOSAGE OF FOLIC ACID IN PREGNANCY

by

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Anaemia in pregnancy till now is the commonest of all diseases that our women suffer from during pregnancy. It occupies the highest position amongst the various causes of maternal mortality in our country.

Iron deficiency anaemia is the most prevalent one in our country, incidence of which is widely variable from 30 per cent to 60 per cent during pregnancy. Haemoglobin percentage progressively falls with advancing gestation and in about 50 per cent to 60 per cent women the level falls below 10 Gm%. Good majority of them respond well to only iron therapy but in sizeable proportion of pregnant women associated folic acid and/or vit. B_{12} deficiency exists as well (Iyengar, 1971).

The clinical picture of folic acid deficiency anaemia was first reported by Channing from Boston in 1842. Osler in 1919, noted its similarity to Addisonian pernicious anaemia but commented that recovery could take place (Osler, W., 1919).

Snell and Peterson (1939) found out a factor in the liver which was essential for the growth of Lactobacillus Casei.

The same growth factor was isolated from the leaves of spinach and other green vegetables by Mitchell, Snell and Williams in 1941. The factor was isolated from yeast and liver by Stockstad in 1943 and was synthetically prepared by Angier in 1945. This factor is now well known as folic acid.

Material and Method

The present study consists of seventy-five patients who were taken from Antenatal Out-patients Department of R. G. Kar Medical College & Hospital, Calcutta, from February, 1972, ending in December 1972. Patients were included under various study groups to study the efficacy of a combination of dried ferrous sulphate I.P. 150 mg. and Folic Acid I.P. 0.5 mg. capsule in comparison to other haematinics. The study groups were supplied with particular type of haematinics for two weeks and were followed up every fortnight. Haemoglobin percentage, packed cell volume, mean corpuscular volume and R.B.C. count were done for all of them during antenatal check-up. In this study 10 gms.% of haemoglobin was taken as the lower limit, giving sufficient allowance for physiological hydraemia that occurs during pregnancy (Table I).

In Group "B" 21 patients were included who were carrying from 16 to 24 weeks having haemoglobin per cent varying from 6 to 10 gms. when they attended

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TABLE I

The Study Groups

Group "A"	:	Those who were receiving	—	150 mgm. of dried ferrous sulphate I.P.
Group "B"	:	Those who were receiving	—	150 mgm. of dried ferrous sulphate I.P. and 0.5 mgm. of folic acid.
Group "C"	:	Those who were receiving	—	30 mgm. of ferrous fumerate U.S.P. and 5 mgm. of folic acid.
Group "D"	:	Those who were receiving	—	350 mgm. of ferrous fumerate B.P. and 2 mgm. of folic acid.
Group "E"	:	Those who were receiving	—	110 mgm. of ferrous fumerate B.P.C. and 2.5 mgm. of folic acid.
Group "F"	:	Those who were receiving	—	folic acid 5 mgm.

the antenatal clinic first. Of these 21 patients, one had haemoglobin per cent as low as 6 gms. with R.B.C. count of 2 million per cu.mm. and P.C.V. of 16% suggesting thereby that she was suffering from normocytic hypochromic anaemia. She was treated with ferrous sulphate 150 mgm. and folic acid 0.5 mgm. one capsule twice daily from her very first check up at 16 weeks of pregnancy.

She improved quite significantly and had haemoglobin per cent increased to 9.5 gms., R.B.C. count of 3.2 million per cu. mm. and P.C.V. of 20% at 34 weeks of pregnancy, although she had a fall of haemoglobin per cent from 8.5 gms. at 24 weeks to 8.2 gms. at 28 weeks but since then the progress had been a steady one and at term had haemoglobin per cent of 10.8 gms. and R.B.C. count of 4 million per cu.mm. Her labour was smooth and uneventful.

Rest twenty patients had haemoglobin per cent ranging between 7.5 gms. to 10 gms. with wide variation of M.C.V. from 48 cubic microns to 80 cubic microns. Main observation at first attendance of these 20 patients is shown in Table II.

Fifteen of these patients had their confinement at this hospital. The rate of improvement of Haemoglobin per cent and R.B.C. count of these 15 patients are indicated in Table III.

Two of the patients expressed inability to swallow capsule and were advised

TABLE II

Haemoglobin Percentage, R.B.C. Count, P.C.V. and M.C.V. (average values) are Shown Group "B"

No. of subject	Haemoglobin percentage	R.B.C.	P.C.V.	M.C.V.
4	7.5 gms. (18 wks)	2.69 mill/cu.mm	17%	66.4 cubic microns.
3	8.5 gms. (18 wks)	3.43 mill/cu.mm.	17.3%	50.4 cubic microns.
2	8.8 gms. (24 wks.)	3.70 mill/cu.mm.	18%	48.6 cubic microns.
9	9.2 gms. (18 wks)	3.91 mill/cu.mm.	20.7%	52.7 cubic microns.
2	10 gms. (18 wks)	4.22 mill/cu.mm.	23%	54.4 cubic microns.

TABLE III

Effect of Treatment in Group—"B"

No. of Subject	Initial		24 Weeks		28-30 Weeks		38-40 Weeks	
	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)
2	10 (18 wks)	4.22	11.2	4.32	11	4.28	12.2	4.42
2	8.8 (24 wks)	3.70	—	—	9.8	3.86	11.2	4.12
5	9.2 (18 wks)	3.91	10	3.96	9.8	3.88	11.4	4.24
3	7.5 (18 wks)	2.6	8.2	3.1	9.2	3.72	10.2	3.85
2	8.5 (18 wks)	3.52	9.4	3.6	10	4.1	11	4.24
1	6 (16 wks)	2.00	8.5	2.89	8.2	2.9	10.8	4.00

to open the capsule and swallow the spansule to which they had no difficulty.

One patient experienced some gastro-intestinal upset during the early part of treatment with this drug which subsided within a few days and she continued the treatment.

Fifteen patients were included in Group "A". They had their first antenatal check-up between 18 to 24 weeks of pregnancy. All of these patients did not have their first check-up on the very same day.

Main observation in this group of 15 cases at first attendance and rate of improvement of haemoglobin per cent and R.B.C. count are indicated in table IV.

If we consider the rate of improvement as a whole, then it is quite evident that the rate of progress was a little slower than what it was expected. It may be due to either, that this group includes a few patients who were having folic acid deficiency along with that of iron and as folic acid was not being supplemented these patients of nutritional macrocytic anaemia did not improve to the extent at which iron deficiency anaemia cases did improve, causing a discrepancy in the result or it may be due to improper absorption of iron by these patients and associated protein deficiency.

Ten patients were included in Group "C". Observation of haematocrit values at first attendance and rate of improvement of haemoglobin per cent and R.B.C. count in this group are indicated in Table V.

It was not possible for us to provide all of them with beds at or near term. Out of ten cases, 7 had smooth and uncomplicated labour. The rest three did not turn up after their last check-up between 38 to 40 weeks.

Ten cases were included in Group "D". Observation of haematocrit values in this group during their first attendance bet-

TABLE IV

Effect of Treatment in Group—"A"

No. of Subject	Initial				24-26 Weeks		28-30 Weeks		38-40 Weeks	
	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	P.C.V. %	M.C.V. (cubic micron)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)
7	10 (18 wks)	4.2	27	65	10.8	4.32	10.3	4.3	12.5	4.34
2	7 (24 wks)	1.57	16	102	—	—	6.8	1.55	8.5	3.2
4	9.5 (18 wks)	3.85	20	51.9	10.4	3.96	10.2	3.98	11.1	4.01
2	8.5 (18 wks)	2.75	18	65.4	10	3.9	9.8	3.95	10.6	3.98

TABLE V

Effect of Treatment in Group—"C"

No. of Subject	Initial				24-26 Weeks		28-30 Weeks		38-40 Weeks	
	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	P.C.V. (%)	M.C.V. (cubic micron)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)
2	8.5 (18 wks)	3.6	18	50	9.2	3.75	9	3.7	10.8	3.9
4	9 (22 wks)	3.75	20	53.3	No significant change		8.8	3.68	11.6	4.2
4	9.5 (20 wks)	3.85	20	51.9	10	3.92	9.8	3.88	11	4

ween 20 to 24 weeks and rates of improvement of haemoglobin per cent and R.B.C. count in this group are indicated in Table VI.

One patient showed intolerance to oral iron and therefore has been omitted from the series.

Ten expectant mothers were treated with ferous fumarate B.P.C. 110 mg. and folic acid 2.5 mg. from their first antenatal check-up between 24 to 26 weeks of pregnancy (Gr. "E").

Observations of haematocrit values in this group at first attendance and rate of improvement of haemoglobin per cent and R.B.C. count in this group after oral administration of ferrous fumarate B.P.C. 110 mg. and folic acid 2.5 mg. daily are shown in Table VII.

Patients belonging to Group "F" i.e. those who were receiving folic acid 5 mgm., who were anaemic, having haemoglobin percentage between 9—10 gms. did not show any remarkable change in their haematocrit values. Only nine cases were included in this group. Two of them were multigravidae and had labour at 35 weeks of pregnancy and delivered very premature babies weighing just 2000 gms.

Comment

Going through the haematocrit values of different group of patients at different period of pregnancy receiving variable amounts of iron and folic acid we can say that the results of the Group "B" i.e. those who received 150 mg. of ferous sulphate I.P. and 0.5 mg. of folic acid was most encouraging and significant. Surprisingly enough they had just 300 mgm. of iron and minimum amount of folic acid supplementation. We therefore do not find any reason or justification in overloading an expectant mother with greater quantity of iron and folic acid when 300

TABLE VI

Effect of Treatment in Group—"D"

No. of Subject	Initial				24-26 Weeks		28-30 Weeks		38-40 Weeks	
	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	P.C.V. (%)	M.C.V. (cubic micron)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)	Hb% (Gms)	R.B.C. (mill/ cu.mm.)
2	7 (20 wks)	1.62	16	90.1	7.5	1.8	7.4	1.78	10.8	3.98
3	8 (22 wks)	2.95	18	61	No significant change		7.82	2.9	10.8	3.96
1	8 (24 wks)	3.25	18	55.3	—	—	8.2	3.3	11	4-
4	10 (24 wks)	4.05	26	64.1	—	—	9.8	3.98	11.8	4.45

TABLE VII

Effect of Treatment in Group—"E"

No. of Subject	Initial				28-30 Weeks		38-40 Weeks	
	Hb% (Gms)	R.B.C. (mill/cu.mm)	P.C.V. (%)	M.C.V. (cubic micron)	Hb% (Gms)	R.B.C. (mill/cu.mm)	Hb% (Gms)	R.B.C. (mill/cu.mm.)
2	7.5 (24 wks)	2	16	80	7.2	2	10.2	3.98
4	8.5 (26 wks)	2.85	18	63.1	8	2.78	11	4.12
2	8 (24 wks)	2.78	16	57.5	7.2	2.8	10.7	4.02
2	10 (26 wks)	4.05	24	59.2	10.2	4.1	11.6	4.62

mgm. of iron and 1 mgm. of folic acid suffice in the prevention of development of anaemia in pregnancy.

Summary

1. Seventy-five pregnant women of different parity and duration of pregnancy were selected to study the efficacy of giving dried ferrous sulphate 150 mg. and folic acid 0.5 mg. capsule in comparison to other haematinics.

2. An attempt was made to determine exact amount of folic acid requirement in pregnancy, both for prevention and curative purposes.

3. Clinical observation in these study groups of patients justifies administration of minimum amount of folic acid together with iron for satisfactory improvement of haematocrit values during pregnancy.

4. A plea has been made to avoid overloading of an expectant mother with greater quantity of iron and folic acid which might be of no use to her.

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