Scandinavian Journal of Primary Health Care

ISSN: 0281-3432 (Print) 1502-7724 (Online) Journal homepage: https://www.tandfonline.com/loi/ipri20

# Iron supplementation in pregnancy: General practitioners' compliance with official recommendations

Benedicte Eskeland & Kirsti Malterud

**To cite this article:** Benedicte Eskeland & Kirsti Malterud (1993) Iron supplementation in pregnancy: General practitioners' compliance with official recommendations, Scandinavian Journal of Primary Health Care, 11:4, 263-266, DOI: 10.3109/02813439308994841

**To link to this article:** https://doi.org/10.3109/02813439308994841

*Scand J Prim Health Care 1993; 11: 263–266*

# Iron supplementation in pregnancy

*General practitioners' compliance with official recommendations*

Benedicte Eskeland and Kirsti Malterud

*Division of General Practice, Department of Public Health and Primary Health Care, University of Bergen, Ulriksdal 8 c, 5009 Bergen, Norway*

**Eskeland B, Malterud K. Iron supplementation in pregnancy. General practitioners' compliance with official recommendations. Scand J Prim Health Care 1993;11:263–6.**

***Objective:*** **To compare general practitioners' routines regarding iron supplementation in pregnancy with national recommendations.**
***Design:*** **Mailed questionnaire to general practitioners.**
***Setting:*** **A county in western Norway.**
***Subjects:*** **184 general practitioners.**
***Main outcome measures:*** **Descriptive registration of reported routines regarding assessment and supplementation of iron.**
***Results:*** **11% of general practitioners reported complete adherence to the national programme recommending iron supplements for everyone in the second half of pregnancy and use of s-ferritin estimation if Hb falls below 11 g/dl. 36% of the doctors prescribed iron supplements routinely irrespective of iron status. 87% reported use of s-ferritin estimation in antenatal care; usually on indication of low Hb, almost 20% as a routine screening in all pregnancies.**
***Conclusion:*** **General practitioners' compliance with national recommendations for iron supplementation in pregnancy is very low and probably reveals a need both for a review of the national recommendations and for an approach to increase compliance with given standards.**

**Key words: iron supplementation, pregnancy, s-ferritin, haemoglobin, general practice.**

**Benedicte Eskeland, MD, Department of Public Health and Primary Care, Division for General Practice, University of Bergen, Ulriksdal 8c, N-5009 Bergen, Norway.**

Pregnancy causes an increased demand of iron for growth of the foetus, placenta, and the expanding red cell mass (1–3). Estimations of s-ferritin concentration reflect depleted iron stores at the end of pregnancy in most women who have not taken iron supplements (1,2,4,5). On these grounds, policies of routine iron supplementation in pregnancy have been established in many European countries, including Norway, Denmark, and Iceland. Other countries, such as the United Kingdom, Sweden, and Finland have policies on prescribing iron supplementation only when indicated (6).

In Norway, practically all uncomplicated antenatal care is carried out by general practitioners (GPs), sometimes in cooperation with midwives (7). A national programme for antenatal care was launched in 1984 (7), including recommendations of daily doses of 50 – 100 mg elementary iron to everyone in the second half of pregnancy. According to the programme, haemoglobin is suggested as the only routine blood test throughout pregnancy, supplemented by s-ferritin if haemoglobin falls below 11 g/dl. Little is known about the extent to which doctors and pregnant women follow these recommendations.

The aim of the project was to register GPs' routines, and compare them with national recommendations, regarding

1) iron supplementation for pregnant women, and
2) application of laboratory tests for diagnosing iron deficiency in pregnancy

as compared to the national recommendations.

## Method

In 1990, a questionnaire was mailed to all GPs in a county in western Norway (Hordaland).

The GPs were asked to report their usual routines regarding iron medication in pregnancy, their methods for individual assessment of iron need, and their use of s-ferritin estimation in antenatal care. The answers were precategorized, mostly as dichotomized alternatives.

Differences between proportions were tested with chi-square analysis with Yates' correction (8), comparison of means with two-sided Student's t-test. Significance was accepted at the 5% level ($p < 0.05$).

## Material

208 doctors out of 254 (82%) returned the questionnaire after one reminder. 24 of the 208 were not filled in due either to doctors being retired or away from their practices (12 doctors) or to lack of antenatal care in their practice (12 doctors). The final material thus comprised answers from 184 GPs.

80% of the doctors were men. Median postgraduate experience was 10 years (range: 1 – 37). Estimated annual number of women in antenatal care was 10 or less for 30% of the doctors, 11 to 20 for 30%, and more than 20 for 40% .

## Results

21 doctors (11%) reported full compliance with the national recommendations by prescribing iron to all women during the second half of pregnancy *and* measuring s-ferritin levels when Hb levels fell below 11.

*Routines for iron supplementation*

The distribution of routines in the material is presented in Figure 1. 66 doctors (36%) reported that they prescribed iron supplements to everyone in pregnancy. 5 of the 66 recommended iron supplementation from early pregnancy, 55 (30% of all) from the 20th week, and 6 from the last trimester.

The daily doses recommended for routine supplementation by the informants are presented in Table I.

Table I. *Daily doses of iron supplements when recommended routinely in pregnancy*

| | (N = 66) | |
|---|---|---|
| | n | % |
| < 50 mg | 0 | 0 |
| 50–99 mg | 35 | 53 |
| 100 – 199 mg | 22 | 33 |
| 200 or more | 4 | 6 |
| Doses not noted | 5 | 8 |
| Total | 66 | 100 |

118 doctors (64%) did not prescribe routine iron supplementation as recommended, but assessed iron need in every pregnant woman individually. Doctors with less than the median 10 years of postgraduate

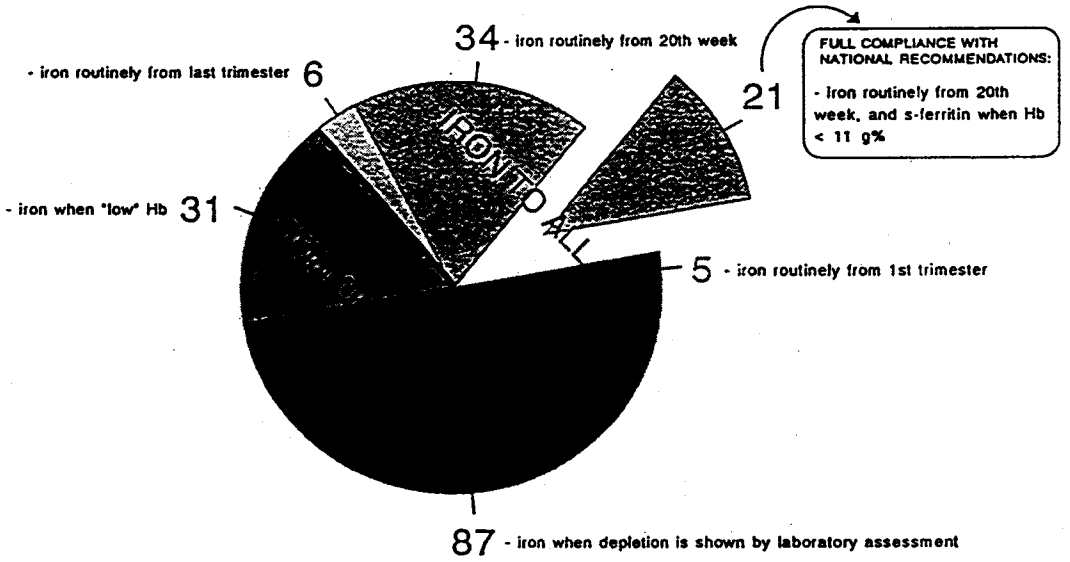


*Fig. 1.* Routines for iron supplementation (184 general practitioners).

experience recommended iron routinely to all women significantly more often than those with longer experience ($p < 0.03$).

There were no significant relationships between the doctors' recommendation practice and the annual number of women in antenatal care, nor with the doctors' sex.

*Laboratory test for assessment of iron need*

Of the 118 doctors who did *not* prescribe iron prophylaxis routinely, 31 (17% of the whole material) would start iron medication solely on the indication of low Hb (range 10–12.5, mean 11.0, SD 0.7), whereas 87 of these 118 (47% of the whole material) would assess iron status by supplementary tests before prescription.

S-ferritin was the dominating test of choice to supplement Hb either routinely or on indication. The given indications for requesting s-ferritin are shown in Table II. There were no significant differences in the use of laboratory tests between the group advocating iron supplements for all in pregnancy and those not doing so. Screening of s-ferritin levels once or more during every pregnancy was reported by 20%; mostly during the first antenatal visit or around the 20th week of pregnancy. The large majority would estimate s-ferritin on the indication of low Hb, although with different opinions of what level is to be considered low ( range 9.7 – 12.5, mean 10.7). 55 (30%) chose the recommended Hb-level of 11. 13 reported a variable Hb-level as cut-off point for s-ferritin estimation, depending either on time in pregnancy or relative Hb-fall in the individual pregnant woman. Tests other than Hb and s-ferritin were only used by 14 doctors, and all but one of these would use s-ferritin as well.

Table II. *Indications given for requesting s-ferritin estimation in antenatal care*
(Several options possible)

| | (N = 184) n | % |
|---|---|---|
| Never requested | 21 | 11 |
| Low Hb | 127 | 69 |
| Routine screening | 36 | 20 |
| Symptoms possibly related to iron deficiency | 8 | 4 |
| Control during iron therapy | 7 | 4 |
| Control when iron is not taken prophylactically | 4 | 2 |
| Other/not specified | 8 | 4 |

## Discussion

*Internal and external validity*

Our study presents GPs *reported* routines concerning iron medication in pregnancy, which might diverge from their *actual* practice in everyday antenatal care. However, the low compliance with the national recommendations indicates idealized answers as a minor error.

One respondent commented on semantic imprecision in the questionnaire. Using both the term «iron medication» and «iron supplementation» without differentiation of *prophylaxis* versus *treatment* could possibly have reduced the internal validity of the study. We find this unlikely, because it is not customary to make this differentiation in everyday antenatal care.

The high response rate (82%) minimizes the likelihood of a sampling bias.

The material consisted of GPs from only one area in Norway, but there is no reason to suspect that doctors in this area differ substantially from doctors elsewhere in Norway. The sex distribution of responding and non-responding doctors did not differ significantly.

The study tells nothing about pregnant women's compliance with the doctors' recommendations for iron supplementation, probably making their actual intake of iron supplements in pregnancy even less consistent than is here shown.

*Reasons for non-compliance with the recommendations*

The study has shown that only a minority of Norwegian GPs follow the national recommendations for iron supplementation in pregnancy. The results are in contrast to those reported from a Danish county, where 66% of pregnant women started iron supplementation from the first trimester (9) and to an Irish study of 400 pregnancy records documenting prescription of iron supplements to *all* (10). In the Irish study, interviews with the women revealed that about 60% of the same women took their iron supplements as prescribed.

The low rate of doctors prescribing iron supplements routinely may be due to failing acknowledgement of the national recommendation among GPs, or their skilled disagreement with such a recommendation. Studies questioning iron supplementation irrespective of individual needs (11–14), and lack of evidence of harmful consequences by omit-

ting iron supplementation in pregnancy (14) favours the latter explanation. The doctors' «clinical intuition», acknowledging pregnancy as a natural, non-medical condition in women, as well as experience of women suffering from side effects from iron medication may be other explanations.

The high proportion of doctors using s-ferritin measurements in antenatal care indicates that GPs are updated on the assay as the best laboratory test at present for estimation of iron status in pregnancy (1,4,5,15). Still, the low rate of routine screening in the material indicates that many clinicians incorrectly put greater emphasis on Hb-values than on iron status. This may be explained by the recent focus on high haemoglobin levels as a risk factor for poor pregnancy outcome (16,17) and falling haemoglobin as a sign of physiological haemodilution rather than iron depletion (12).

One of the arguments for recommending iron routinely is that iron prophylaxis is cheaper than testing everybody to find out about actual need for iron (18). The doctors in our study, however, did not seem to trust routine prescription as an alternative to checking iron status: doctors who prescribed iron routinely took as many blood tests as the ones who did not.

When iron supplements are prescribed routinely, the majority of doctors choose doses that conform with the national recommendations, but not with more recent recommendations suggesting that doses of about 30mg /day are sufficient for routine supplementation in pregnancy (19, 20).

As long as a need for routine iron supplementation in pregnancy is not sufficiently documented (9,14), we conclude that GPs may be justified in their non-compliance with the actual recommendations. National recommendations should be reviewed in order to detect those in need of iron rather than prescribing supplements for everybody. Clinical audit might be a feasible way of increasing compliance with given standards.

## Acknowledgements

The study was financially supported by The Norwegian Medical Association and The Norwegian College of General Practitioners.

## References

1. Puolacca J. Serum ferritin as a measure of iron stores during pregnancy. Acta Obstet Gynecol Scand 1980: Suppl 95.
2. Taylor DJ. Prophylaxis and treatment of anaemia during pregnancy. Clin Obstet Gynaecol 1981; 8: 297–314.
3. Hallberg L. Iron balance in pregnancy. In: Berger B, ed. Vitamins and minerals in pregnancy and lactation. New York: Nestle Nutrition Workshop Series 1988; 16: 115–27.
4. Romslo I, Haram K, Sagen N, Augensen K. Iron requirements in normal pregnancy as assessed by serum ferritin, serum transferrin saturation and erythrocyte protoporphyrin determinations. Br J Obstet Gynaecol 1983; 90: 101–7.
5. Agha F. Serum ferritin in diagnosis of iron deficiency during pregnancy. J Pak Med Assoc 1989; 39: 171–2.
6. Thambypillai V. Policies on iron in Europe. WHO Regional Office for Europe, Copenhagen 1988: (Working paper) ICP-CLR-157.
7. Norges offentlige utredninger. Perinatal omsorg i Norge (Perinatal care in Norway); NOU 1984:17. Oslo: Forvaltningstjenestene, Statens trykningskontor, 1984.
8. Altman DG. Statistics for medical research. London: Capman and Hall, 1991.
9. Thambypillai V, Staehr-Johansen K. Policies on iron in Denmark. Haematologia 1990; 23: 145–9.
10. Alward N, Kevany J. Iron supplementation during pregnancy: a survey of the current situation. Ir Med J 1984; 77: 112–4.
11. Do all pregnant women need iron? (editorial) BMJ 1978; ii: 1317.
12. Goodline RC. Why treat «physiologic» anemias of pregnancy? J Reprod Med 1982;27: 639–46.
13. Hibbard BM. Iron and folate supplements during pregnancy: supplementation is valuable only in selected patients. BMJ 1988; 297:1324,1326.
14. Hemminki E, Rimpelae U. A randomized comparison of routine versus selective iron supplementation during pregnancy. J Am Coll Nutr 1991; 10: 3–10.
15. Thompson WG. Comparison of tests for diagnosis of iron depletion in pregnancy. Am J Obstet Gynecol 1988; 159: 1132–4.
16. Garn SM, Ridella SA, Petzold AS, Falkner F. Maternal hematologic levels and pregnancy outcome. Semin Perinatol 1981; 5: 155–62.
17. Murphy JF, O'Riordan J, Newcombe RG, Coles EC, Pearson JF. Relation of haemoglobin levels in first and second trimester to outcome of pregnancy. Lancet 1986; i: 992–4.
18. Horn E. Iron and folate supplements during pregnancy: supplementing everyone treats those at risk and is cost effective. BMJ 1988; 297: 1325,1327.
19. Halvorsen R, Borch-Johnsen B. Jern og risikogrupper for jernmangel (Iron and groups at risk for iron deficiency). Tidsskr Nor Laegeforen 1990; 110: 3765–6.
20. Herbert V. Recommended dietary intakes (RDI) of iron in humans. Clin Nutr 1987; 45: 679-86.

Received November 1992
Accepted March 1993