Operational problems of an iron supplementation programme for pregnant women: an assessment of UNRWA experience

S. Pappagallo[1] & D.L. Bull[2]

Assessed is a large-scale iron supplementation programme for the 70 000 pregnant refugee women cared for by the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). For this purpose, a retrospective survey of 1267 antenatal records was conducted in health centres located in the West Bank, Gaza, Syrian Arab Republic, Jordan, and Lebanon. The following operational problems were identified: late entry to antenatal care; high drop-out rate from antenatal care; low compliance in follow-up haemoglobin examinations; and misdirected continued testing of women who were not anaemic at registration.

Routine iron supplementation of all pregnant women should be considered only in those countries where severe anaemia is prevalent and should always be coupled with additional interventions that are effective at improving iron deficiency anaemia in a given population. In most countries attention should be directed towards changing dietary habits to enhance the availability of local foodstuffs that are rich in iron. One initial haemoglobin test may help in focusing on the relatively few initially anaemic subjects who need further attention. Repeated testing during pregnancy is unwarranted.

Introduction

For many years iron deficiency anaemia among pregnant women has been a major target for interventions because of the presumed negative effects of anaemia on the health of mothers and babies. In a recent FAO–WHO report, however, only 11 countries were found to have comprehensive programmes to control iron deficiency anaemia. The report stressed that short-term interventions often show dramatic results in limited target populations of carefully controlled trials or in hospital and clinical settings, but then fail to work when applied to the real world.[a] Anaemia control programmes among pregnant women are often based on iron supplementation in antenatal care settings, with limited population coverage, poorly defined implementation procedures, logistics problems, scant supervision, and insufficient monitoring.

Assessments of the performance and impact of countrywide iron supplementation programmes are also disappointingly few. Operational research is frequently directed towards specific aspects, such as experimental delivery strategies or treatment with new formulations of iron. Other studies have evaluated the impact of iron supplementation in small-scale and time-limited implementation projects, often under semi-experimental conditions.

Gauging the impact and quality of operational procedures in large-scale, ongoing programmes is extremely important in order to determine their sustainability under field conditions. This article assesses a routine iron supplementation and haemoglobin screening programme for the 70 000 pregnant women (>60% of the estimated total number of pregnancies) cared for annually by the maternal and child health services of the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). Identified and discussed are the operational problems of a large-scale iron supplementation programme implemented among the Palestinian refugee populations of the West Bank, Gaza, Syrian Arab Republic, Jordan, and Lebanon.

The prevalence of anaemia among Palestinian refugee pregnant women was high according to the results of a survey carried out in 1990: about 33% had haemoglobin levels <110 g/l in the second

[1] Chief, Health Protection and Promotion, United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), P.O. Box 140157–Amman 11814, Jordan. Requests for reprints should be sent to this author at the following address: via Caselle 9, 10071 Borgaro–Torino, Italy.
[2] Technical Adviser, Health Services Research, UNRWA, Jerusalem.

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trimester, and 59%, in the third trimester.[b] The main cause of anaemia was found to be nutritional.

In the absence of food fortification programmes and/or activities to introduce changes in nutritional patterns on a population basis, UNRWA is employing iron supplementation and haemoglobin screening as the main strategy for preventing and controlling anaemia in pregnant women. UNRWA's guidelines require all pregnant women to be tested routinely for haemoglobin at enrolment in the antental care system and at about 32 weeks' gestation.

UNRWA's infrastructure of primary health services provides an ideal setting for providing iron supplements to pregnant women and children. Basic maternal and child health services are well developed and located in refugee camps and urban areas that have a large number of refugees. Access to antenatal services is unmatched by few other primary health care systems; services are free of charge and well positioned in relation to the population; and the staff are well trained and the laboratory services well developed. Material incentives, such as distribution of food rations, provide additional motivation for pregnant women to enrol in UNRWA's antenatal care system. Most important of all, UNRWA's implementation is based on well-specified written guidelines that are meant to be carefully observed by the health staff in their daily practice.[c]

Using the operational cut-off point of 100 g/l, women whose haemoglobin levels were greater than or equal to this amount were considered "normal" and received as prophylaxis one 200-mg tablet of iron(II) sulfate per day (equivalent to 40 mg iron per tablet). Women had to make monthly visits to obtain a supply of tablets, and those whose initial haemoglobin concentration was ≥100 g/l were required to have their level checked again at 32 weeks' gestation. A different procedure was followed for women who were found to be anaemic (haemoglobin <100 g/l) at their first visit. Such women were given iron(II) fumarate tablets (200 mg; equivalent to 65 mg iron per tablet; one tablet 3-times daily) and had their haemoglobin level tested monthly until it increased to ≥110 g/l.

Parenteral iron (iron–dextran complex (Imferon); 50 mg/ml in 2-ml ampoules) was given only in

very limited circumstances, i.e., to women whose haemoglobin concentration was ≤90 g/l during the last 6 weeks of pregnancy, or if they had not responded to oral iron administered over a period of 3 months.

Anaemia status during pregnancy cannot be expected to improve without the correct implementation of the guidelines by health centre staff. In this respect the study attempted to answer the following specific questions:

— Were there problems with compliance with the guidelines, regardless of the origins and reasons for such problems?

— Was the expected increase in the prevalence and severity of anaemia at term prevented by the programme?

— Did the programme meet its principal objective of ensuring that pregnant women delivered with a haemoglobin concentration ≥110 g/l?

Materials and methods

A retrospective survey of individual records containing the results of haemoglobin measurements over the course of pregnancy was carried out to assess the programme and the extent of compliance with the screening and iron supplementation procedures. Data on the same patients were obtained at different times during their pregnancies.

The sampling frame consisted of 70 000 pregnant women who initially registered in UNRWA's antenatal clinics over the period 1 July 1991 to 30 June 1992. Data were collected from October 1992 to June 1993 and virtually all women sampled had delivered by this time. Antenatal cards were selected from the larger health centres in all areas of UNRWA operations, as follows: Gaza (198 cards); Syrian Arab Republic (255); West Bank (539); Lebanon (154); and Jordan (121). The total sample consisted of 1267 antenatal cards. The number of cards selected at each health centre was based on the relative number of registered pregnant women attending their services; the serially numbered cards were chosen systematically, with every *n*th card selected until the desired sample size was attained.

The data on UNRWA's antenatal cards were based on direct clinical observation and/or verbal information supplied by the patients, as recorded by the nursing staff. Haemoglobin determinations were made at several different stages during the course of each pregnancy by the cyanmethaemoglobin method using a spectrophotometer. All data processing and

[b] **Yip R et al.** *Report of the UNRWA nutrition survey of Palestinian refugees in Gaza, Jordan, Lebanon, Syria and West Bank.* Amman, Jordan, United Nations Relief and Works Agency for Palestinian refugees in the Near East. Unpublished document, 1990.
[c] *Management of iron deficiency anaemia among eligible Palestine refugees.* Amman, Jordan, United Nations Relief and Works Agency. Unpublished document, 1990 (Instruction Series HD/PP/02/90).

Table 1: Average gestational age at registration and at subsequent check-ups for haemoglobin level

	Registration	At 2nd test	At 3rd test	At 4th test	At 5th test	At 6th test
Average gestational age ± SD (weeks)	20.3 ± 5.1	30.7 ± 5.2	34.6 ± 4.7	37 ± 3.6	38.2 ± 3.5	36.2 ± 3.1
No. of women	1 179	986	424	129	21	4

analysis were performed using a microcomputer with EpiInfo-5 software.

Results

The mean age of the sample of women studied was about 26 years and their mean parity was approximately 3 (excluding the pregnancy under consideration).

The mean gestational age at the time of the first registration was 20 weeks; less than 10% of the women registered during the first trimester of pregnancy. As shown in Table 1, the number of women lost to follow-up increased dramatically after 30 weeks' gestation.

UNRWA's guidelines require that pregnant women be visited, tested, and supplied with iron tablets at the same time. Compliance with these operational instructions appeared partially satisfactory at the initial patient–service contact. Only 72% (894/1245) of all new antenatal patients were screened for haemoglobin levels at the time of registration, though almost all of them (93%) were tested and supplied with iron tablets within 2 weeks.

The prevalence of anaemia (defined operationally as a haemoglobin concentration <100 g/l) at the time of initial registration at the antenatal clinics was around 7.0% and increased to about 11% for haemoglobin determinations performed at 32 weeks' gestation or later (Table 2). When anaemia was defined by a haemoglobin level <110 g/l, its prevalence at the

time of registration was 29%, increasing to 38% at 32 weeks' gestation or later.

Of the 7% of women with haemoglobin concentrations <100 g/l at their first visit, 92% were checked a second time, after an average of 6.5 weeks — an adequate compliance level with the follow-up instructions for anaemic subjects. About 76% of women identified as anaemic at their first check-up (haemoglobin <100 g/l) showed an improvement at the second check-up (usually 6.5 weeks later), a satisfactory result compared with the nonanaemic participants.

In either case, improvement was simply defined as a haemoglobin level at the second value visit that was greater than that at the first (Table 3).

The average improvement in haemoglobin level between the two checks among the anaemic women was about 8 g/l (Table 4). Haemoglobin levels fell slightly among nonanaemic subjects between the first and second checks, the average difference being −3 g/l. These findings may not have any clinical significance, although the improvement in haemoglobin level among anaemic subjects achieved after iron

Table 2: Prevalence of anaemia in pregnant women at the two routine check-ups

	No. of women at:	
Haemoglobin level (g/l)	Registration	32 weeks' gestational age
<110	359 (29)[a]	277 (38)
<100	90 (7)	82 (11)
<90	21 (2)	22 (2)
<80	3 (0.2)	3 (0.4)
<70	1 (0.1)	0 (0)
Total number of records	1 248	735
Average haemoglobin level (g/l) ± SD	115 ± 11.2	112 ± 11.7

[a] Figures in parentheses are percentages.

Table 3: Improvement in haemoglobin levels of anaemic and nonanaemic pregnant women between the first and second check-ups[a]

Haemoglobin level at first visit (g/l)	No. non-improved	No. improved	Total
<100	20 (24)[b]	63 (76)	83 (8)
>100	609 (64)	344 (36)	953 (92)
Total	629 (61)	407 (39)	1036 (100)

[a] Data are for women whose haemoglobin levels were recorded at both first and second check-ups.
[b] Figures in parentheses are percentages.

Table 4: Improvement in haemoglobin levels of paired anaemic and nonanaemic pregnant women between the first and second check-ups

Haemoglobin level at 1st check-up (g/l)	No. of women	Mean difference in paired values ± SD[a] (g/l)	95% confidence interval
<100	83	+8.3 ± 11.5[b]	5.7 to 10.8
>100	953	−3.3 ± 11.7[b]	−2.6 to −4

[a] (Haemoglobin level at 2nd visit) — (haemoglobin level at 1st visit).
[b] $P < 0.001$.

supplementation may be taken as evidence that iron deficiency was indeed the main reason for their anaemia.
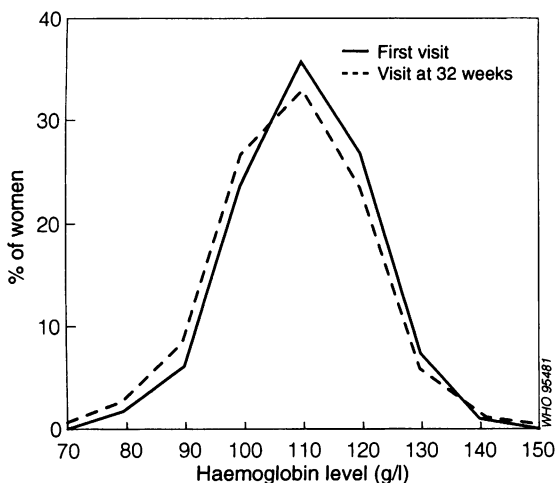
The improvement in the haemoglobin level of the majority of initially anaemic subjects was maintained until the second check-up; about 61% of the women initially diagnosed as anaemic managed to reach and maintain a haemoglobin level of 110 g/l up to this time.

For pregnant women who had "normal" haemoglobin levels (≥100 g/l), UNRWA's policy is to use prophylactic doses of iron supplements and an additional haemoglobin test at 32 weeks' gestational age. Nevertheless, nearly 82% of such women received a second check-up before 32 weeks' gestation; this "over-testing" perhaps reflects a concern among staff that the recommended cut-off point is too low.

A routine second check-up at about 32 weeks' gestation for all women is carried out in order to detect those whose haemoglobin values drop significantly during the last phase of their pregnancy. Compliance with the routine check-up at 32 weeks' gestation or later was poor. Only 59% (735/1248) of the women did so, at an average gestational age of 36 weeks (see Table 2). Although the health centres were located inside the refugee camps and therefore easily accessible to women, there were no differences in the compliance of camp and noncamp residents.

The haemoglobin curve of those pregnant women who were tested at registration and 32 weeks' gestational age was slightly but consistently shifted to the left (Fig. 1).

The most important objective of the anaemia control programme was to maintain an "ideal" haemoglobin level until childbirth (i.e., a haemoglobin level of ≥110 g/l) by supplying iron in prophylactic or therapeutic dosages. In view of the lack of haemoglobin values for the period immediately preceding delivery, the "satisfactory" status was assessed against any last available test result. Using these criteria, 68% (853/1248) of pregnant women left the control programme with a haemoglobin level ≥110 g/l. This finding raises some concern about the fate of the remaining 32% of pregnant women who left the programme with low haemoglobin values.

Discussion

The UNRWA programme seemed to be quite effective in raising the haemoglobin level of pregnant women found to be anaemic at their initial antenatal check-up, and in most cases haemoglobin levels ≥110 g/l were reached and maintained for the duration of supervision.

The major operational weaknesses identified by the study are outlined below.

- Late registration for antenatal care.

- High drop-out rate from antenatal care (even before 32 weeks' gestation).

- Low compliance with the second routine check-up at 32 weeks' gestation.

- Women found to be nonanaemic at the initial test and given prophylactic iron supplements did not improve by their second check-up visit. On average, their haemoglobin level tended to drop slightly.

- The curve of haemoglobin distribution at 32 weeks' gestation was consistently shifted to the left, showing that the women who were attending the programme did not improve their haemoglobin status.

- A substantial proportion of women (32%) dropped out at different stages of their pregnancy with haemoglobin levels <110 g/l.

- Follow-up of defaulters and drop-outs living within the camps was not successful.

- Unwarranted testing of women determined to be nonanaemic at the time of registration resulted in a waste of resources and misdirected attention.

Fig. 1. **Distribution of paired haemoglobin concentrations at registration and the second routine check-up (≥32 weeks' gestational age) for the 735 study women.**

The combination of these operational problems may have caused the programme to fail in its ultimate goal of ensuring that pregnant women had adequate iron reserves at the time of delivery. The reasons behind these weaknesses are multiple, as discussed below.

The fact that pregnant women did not present for antenatal care until well into their second trimester was a function of their choice and UNRWA's rationing policies. An important incentive to register with the antenatal clinic is probably to obtain food rations or a referral for a hospital delivery at no charge. Because of cost considerations, pregnancy testing is carried out at UNRWA's health services, and pregnancy diagnosis for either referrals or ration authorizations is therefore based on clinical signs such as fundal height and quickening, both of which are generally not detectable until the second trimester.

Complex and fragmented procedures for screening and the delivery of drugs may contribute to patient drop-outs: each time a woman has contact with the system her details are recorded and the request is made to visit, test, and question her, as well as to supply iron tablets and educate her. The way all these services are organized and delivered may have a direct effect on the compliance of the patient. For example, the waiting times to register and be seen by a nurse, and the time involved in going to the laboratory for tests, getting the results, and eventually receiving iron tablets may be a disincentive for many women.

The frequency of antenatal check-ups and the lengthy procedures to receive care in the health centres discourage women from seeking attention. Pregnant women in the last trimester may not be motivated to visit medical officers and health staff, simply because of the inconvenience. It is not rare for women, after registration and giving blood for tests, to leave before collecting iron tablets. Irregular drug supply, discoloration of tablets, and other logistic complications also compound the programme.

By and large there was little evidence of serious anaemia even late in pregnancies. The programme appeared to be expending significant resources to detecting and following up a problem that does not seem to be severe in the study population. Continued and repeated testing of haemoglobin levels were simply diverting resources away from the relatively few women who really did merit focused attention.

Based on our findings, UNRWA anaemia control activities have been streamlined and service deliveries improved in an effort to enhance compliance; for example, screening has been reduced to two basic routine check-ups, irrespective of the haemoglobin level, use of "prophylaxis" for women with haemoglobin levels $\geq 110 \, g/l$ has been discontinued, and patients' waiting times have been reduced by distributing iron preparations through nurses, and by ensuring that laboratory results are made available on the same day as tests are carried out. Nevertheless, a central issue in ensuring the sustainability of iron supplementation remains the systematic and constant patient compliance with the service's requirements and with the intake of iron tablets.

Patient acceptance of taking drugs over prolonged periods or of frequent blood testing is limited. This is especially true for mild or moderate anaemia, which is often symptomless and has no perceptible negative health outcomes; in fact, iron supplements often produce side-effects such as gastric discomfort. More attention should therefore be paid to better tolerated formulations such as slow-release iron tablets and iron–protein–succinylate, as well as different methods of drug delivery (short, intensive and single daily-pill treatment) (1).

A basic finding of the study was that women who are anaemic at registration are more compliant with treatment and follow-up. An initial screening visit remains therefore advisable and worthwhile since anaemic women are potentially most at risk of negative health outcomes for themselves and their unborn children.

Currently, successful and sustainable long-term iron supplementation programmes at the country level are lacking. Unless the operational requirements of such programmes change dramatically and patients' acceptance of iron supplements improves, the difficulties that iron supplementation programmes experience under field conditions make them unsustainable and in some circumstances, even unwarranted. Decision-makers may question whether such programmes are actually needed and whether iron supplementation is the only available and effective strategy to control anaemia in pregnancy. Indeed, the value of iron supplementation for prophylaxis or therapy in pregnancy has still to be firmly established for haemoglobin levels other than the lowest.

There is controversial and inconclusive evidence from population studies that anaemia caused by iron deficiency may produce an increase in maternal and neonatal morbidity. For example, in the literature there are reports both denying (2, 3) and stressing (4–6) the existence of a correlation between the iron-nutrition status of mothers and their full-term newborns. Although it is generally accepted that iron supplementation increases iron stores, there is little evidence that modification of haemoglobin levels by iron supplements reduces the risk of a negative outcome.

Many studies highlight the association between maternal iron-deficiency anaemia and a number of pregnancy outcomes such as low birth weight (7), but not small-for-gestational age (8), frequency of premature births, caesarian sections, puerperal complications (9) or low birth weight among primigravidae (10). These studies are, however, based on selective, small samples and often are clinic- or hospital-based. Extrapolation of the findings to large-scale populations and their generalization is therefore difficult.

Even the physiopathological consequences of iron deficiency is controversial, with one study, for example, maintaining that the oxygen-binding properties of haemoglobin molecules are unchanged in the third trimester of normal pregnancies and in pregnancies complicated by iron-deficiency anaemia (11).

There is also conflicting evidence for the possible determinants of iron-deficiency anaemia, with some studies stressing the importance of reproductive behaviours such as parity (12) or prolonged lactation (7) and others suggesting that autoimmune responses, and not iron deficiency, may explain cases of anaemia in pregnancy (13).

Some of the differences in the results reported by studies can be ascribed to the laboratory techniques employed, the haematological indices used to assess iron deficiency, the simultaneous presence of other diseases (congenital and chronic diseases, malabsorption, bleeding, and infectious and parasite diseases), or nutritional deficiencies (zinc, vitamin B12, folic acid, vitamin A) and confounding factors (age, parity, use of contraceptives, socioeconomic status, etc.).

The relation between the level of haemoglobin and pathologies remains unknown except for the lower and more extreme haemoglobin levels. Identification of clear cut-off points is therefore extremely important because they could entail vastly different levels of resource investments and actions.

The debate on the health importance of iron deficiency anaemia is further complicated by conflicting reports on the haematological changes during pregnancy. With the exception of the mean corpuscular volume (MCV) and zinc protoporphyrin (ZnPP), the norms for other tests of whether a pregnant woman is iron deficient or normal are changing. The definition of haematological normality is usually based on data for nonpregnant women or women already taking iron supplements (14), and there is

not even consensus on the stage of pregnancy when haemoglobin concentration "levels out". There are also reports that attempts to "normalize" the blood towards a prepregnancy haemoglobin level may be associated with adverse effects such as macrocytosis, inhibition of zinc absorption, high viscosity, and low birth weight.[d] Indeed, recent reports have suggested that a fall in haemoglobin to 100 g/l is associated with fewer low-birth-weight babies than when no such decline occurs (15).

Also, racial and ethnic diversities may affect the normal haemoglobin distribution, with little evidence of associated increase in health complications ascribed to iron deficiency anaemia (16).

Congenital haemolytic anaemia carriers and cases may also account for some anaemic cases. About 4% of the Palestinian refugee population may be thalassaemia carriers; in this case, haemoglobin levels would be expected to be, on average, 1–1.5 g lower than those among noncarriers.[e] A variable number of homozygotes for thalassaemia and sickle cell diseases may be found among pregnant women with lower haemoglobin levels.

Iron supplementation (with or without individual haematological testing), nevertheless, remains in many cases the strategy adopted to control anaemia during pregnancy and is often preferred to alternative forms of intervention, such as food fortification and education on diets rich in iron, because it is an effective, inexpensive and manageable way to increase iron stores among anaemic subjects. This assumption is, however, not always true and can be sustained only in the presence of a clear epidemiological, clinical, and nutritional profile. For example, the impact on iron status of anthelmintic therapy or mass treatment may be much greater than that of the use of iron supplements (17) and the decision on which strategy to choose and give priority to may depend on the circumstances. Particularly where infections and malnutrition are *not* major causes of iron deficiency anaemia and iron-rich food is available, diversification and improvement of the diet represent a more effective and viable treatment.

The iron content (both haem and non-haem) of local, available food in the study area may be sufficient to cover the needs of pregnancy, provided the compositions of meals are carefully chosen. The nutritional value of diets based on intake of iron from vegetable sources, which are much more affordable than animal sources, has not been stressed enough,

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[d] **Rooney C**. *Antenatal care and maternal health: how effective is it? A review of the evidence.* Unpublished document WHO/MSM/92.4, 1992.

[e] **Angostiniotis M, Modell B.** *Report on hereditary anaemias in UNRWA area of operations.* Amman, Jordan, United Nations Relief and Works Agency for Palestinian Refugees in the Near East (UNRWA), 1993 (unpublished document).

particularly in countries where the ordinary diet is largely based on vegetables rich in iron (as is the case in the Middle East) (*18*).

The extra iron requirement for a singleton pregnancy is about 3.8 mg/day in the third trimester and, for example, the average daily diet in the United Kingdom would provide 12 mg of non-haem iron of vegetable origin (*14*). Because of the increase in iron absorption (about 10-fold) during pregnancy, this amount would be sufficient to cover the extra needs of pregnant women, unless they are heavily depleted of iron stores.

The impact of individual nutritional habits on the bioavailability of non-haem iron, such as the excessive use of iron absorption inhibitors (tea and coffee) or low consumption of fruit rich in vitamin C, is also well documented. The role played by tea and bread in the diet of Palestinian children and pregnant women has often been cited as an important factor contributing to the high levels of anaemia (*19*). The prime focus of attention, therefore, should be on whether the diet of a pregnant woman is adequate enough to ensure a sufficient amount of iron and/whether the absorption of iron from the daily diet can be greatly enhanced.

Conclusions

Currently, iron supplementation programmes are more difficult to execute than vitamin A or iodine-deficiency control programmes. Iron supplementation has some inherent limitations, e.g., the frequency and duration that supplements are used, intolerance, storage instability of iron formulations, and unpleasant side-effects. Iron supplementation programmes should be greatly simplified before they can be efficiently adopted by countries on the large scale.

• Determination of haemoglobin concentrations, delivery of drugs, and the dosage, frequency of administration, and acceptability of iron formulations need to be greatly simplified and improved before iron supplementation programmes can be efficiently adopted by health services.

However, use of iron supplementation for pregnant women should only be routine in situations where supplements can be expected to produce tangible effects on neonatal and maternal morbidity and mortality, i.e., in circumstances where iron deficiency *per se* explains much of the mortality and morbidity.

Determining the haemoglobin level of pregnant women at least once is useful for identifying serious degrees of iron deficiency for which intensive supervision and treatment schedules should be adopted. Women who have been identified to be at risk for negative health outcomes can be persuaded to increase their compliance in taking iron supplements. Screening programmes based on at least one haemoglobin determination during pregnancy make sense in operational, clinical, and economic terms.

Use of iron supplementation on a routine basis without laboratory back-up may be unsuitable for dealing with any form of anaemia since it does not provide an explanation for the underlying causes. Indeed, it may have disastrous consequences.

• Whenever possible, iron supplementation should be combined with at least one routine haematological test during pregnancy (preferably at enrolment for antenatal services). This practice is useful in identifying serious anaemic cases that need to be closely followed up and further investigated. In our study population it was valuable to exclude from the iron supplementation programme the 60–70% of pregnant women whose haemoglobin levels were ≥ 110 g/l. Individuals with such haemoglobin levels generally do not need iron supplementation as prophylaxis. Iron supplementation is not without health risks, and modification and diversification of a pregnant woman's diet may be the only intervention required.

Iron supplementation should always be combined with other forms of public health interventions that are potentially effective in containing iron deficiency anaemia in a specific epidemiological, clinical, and nutritional context (e.g., nutritional education, parasitosis control, fertility regulation, and control of other prevailing micronutrient deficiencies).

• Depending on the overall epidemiological, clinical and nutritional situation, iron supplementation of pregnant women should always be coupled with measures aimed at reducing the burden of infectious diseases, at correcting other microdeficiencies (e.g., vitamin B12, vitamin A, folic acid, iodine, and zinc) and at supporting better nutritional education. More efforts should be exerted to encourage women to increase their dietary intake of iron from all locally available and affordable sources. Vegetables and pulses may contribute substantially to satisfying such needs during pregnancy through the careful selection of recipes and cooking procedures. Bioavailability can be enhanced by shifting the balance in the diet between inhibitors and enhancers of iron absorption.

In situations where iron losses, malabsorption, and malnutrition are not major causes of iron deficiency anaemia, and the availability of iron-rich food

is assured, a sensible alternative to increasing iron stores is to diversify and improve the dietary intake. The iron content (both non-haem and haem) in a normal diet should be better established in the local context and advice on the optimal consumption of available dietary iron should be given to pregnant women.

Acknowledgements

Résumé

Problèmes opérationnels rencontrés dans un programme d'administration de suppléments de fer aux femmes enceintes: évaluation de l'expérience de l'UNRWA

Depuis de nombreuses années, l'administration de suppléments de fer fait partie des mesures classiques de lutte contre la carence en cet élément chez les femmes enceintes. La présente étude visait à évaluer un programme multidisciplinaire à large échelle de lutte contre l'anémie chez 70 000 femmes enceintes inscrites dans les centres de soins prénatals de l'Office de Secours et de Travaux des Nations Unies pour les Réfugiés de Palestine dans le Proche-Orient (UNRWA). L'examen rétrospectif de 1267 dossiers de grossesse a été entrepris dans les centres de santé de l'Office situés sur la Rive occidentale du Jourdain, à Gaza, en République arabe syrienne, en Jordanie et au Liban. L'hémoglobinémie moyenne de ces femmes au moment de leur première visite prénatale était de 115 ± 11,2 g/l; lors du dernier contrôle à ⩾ 32 semaines de grossesse, elle était de 112 ⩾ 117,7 g/l. Pratiquement toutes les anémies diagnostiquées étaient de gravité modérée. Aucun cas d'anémie sévère n'a été découvert dans la population étudiée. Chez les femmes reconnues anémiques lors du premier examen et traitées, la concentration d'hémoglobine a augmenté en moyenne de 8 ± 1,2 g/l en 6 semaines. Chez celles dont l'hémoglobinémie était normale (⩾100 g/l), qui étaient en majorité et qui ont reçu des doses prophylactiques de fer, on a constaté une légère diminution de la concentration moyenne.

Les principaux problèmes opérationnels rencontrés ont été les suivants: entrée tardive dans le programme de suivi prénatal (à partir de la 20ᵉ semaine de grossesse en moyenne), taux d'abandon élevé, mauvaise observance des instructions concernant les examens de contrôle de l'hémoglobinémie et répétition inutile des tests sur des femmes qui n'étaient pas anémiques au moment de leur inscription.

Dans la population à l'étude, l'anémie apparue tardivement en cours de grossesse a toujours été légère ou modérée, de sorte qu'en l'absence d'autres signes cliniques, elle ne justifiait probablement pas la répétition des tests. A l'exception du dépistage initial, la répétition à grande échelle des dosages d'hémoglobine risque simplement d'entraîner un gaspillage des ressources qui devraient être consacrées aux quelques femmes véritablement anémiques.

Compte tenu des limites actuelles inhérentes à tout programme d'administration de suppléments de fer, par exemple en ce qui concerne la durée et la fréquence d'administration des comprimés, l'intolérance, l'instabilité des préparations et leurs effets secondaires désagréables, un traitement prophylactique de routine applicable à toutes les femmes enceintes ne devrait être envisagé que pour les pays et les populations où les cas d'anémie grave sont fréquents et où l'on peut espérer qu'un tel programme ait un impact positif sur la morbidité et la mortalité. Ces mesures devraient être accompagnées d'autres interventions de santé publique ayant fait la preuve de leur efficacité dans un contexte épidémiologique, clinique et nutritionnel donné. Dans la plupart des situations, il faudrait faire porter les efforts sur la modification des habitudes alimentaires en vue d'une meilleure utilisation du fer contenu dans les aliments locaux. Ainsi, les avantages de la lutte contre l'anémie ne seraient pas limités à un groupe cible particulier à un moment donné de la vie (par exemple pendant la grossesse), mais s'étendraient à l'ensemble de la population, y compris les nourrissons sevrés, les enfants d'âge scolaire, les adolescents, les femmes en période préménopausique et les personnes âgées.

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