

## **Iron and Anemia**

[Transpl Int.](#) 2009 Apr;22(4):434-40. Epub 2008 Dec 9.

### **Iron deficiency anemia and iron losses after renal transplantation.**

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Iron deficiency contributes to anemia after transplantation. The magnitude of iron loss from blood loss in the peri-transplantation period has not been quantified. We prospectively estimated phlebotomy and surgical losses over the first 12-weeks following transplantation in 39 consecutive renal transplant recipients on hemodialysis (HD), peritoneal dialysis (PD), or chronic kidney disease (CKD). At transplant, ferritin levels were <200 ng/ml in 51% of the patients, and iron saturation was  $\leq 20\%$  in 44%. CKD patients more commonly had ferritin levels <200 ng/ml than either HD or PD patients (100% vs. 21% vs. 67%,  $P < 0.0002$ , respectively). Blood loss was similar among HD, PD and CKD patients (833 +/- 194 vs. 861 +/- 324 vs. 755 +/- 79 ml respectively,  $P = \text{NS}$ ), and no difference between deceased and living donor transplant recipients (881 +/- 291 vs. 788 +/- 162 ml,  $P = 0.33$ ). Based on baseline hemoglobin (Hgb) of 11.8 g/dl, we estimated that an additional 330 mg of iron was needed to normalize hemoglobin to 13 g/dl, and 605 mg to increase hemoglobin to 14 g/dl. Blood and iron losses over the first 12 weeks post-transplant are substantial and may warrant early administration of intravenous iron.

Publication Types:

- [Research Support, N.I.H., Extramural](#)

PMID: 19076330 [PubMed - indexed for MEDLINE]

**Prevalence of iron deficiency anemia among adolescent schoolgirls from Kermanshah, Western Iran.**

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Iron deficiency anemia is a major health problem in developing countries. Anemia reduces physical work capacity and cognitive function and adversely affects learning and scholastic performance in schoolgirls entering adolescence. A cross-sectional study was conducted to determine the prevalence of iron deficiency, iron deficiency anemia and anemia among adolescent school girls aged 14-20 years from 20 different high schools located in three educational areas of Kermanshah, the capital of Kermanshah province in Western Iran. The prevalence of anemia (Hb<12 mg/dl) among adolescent school girls was 21.4%. Iron deficiency using a ferritin level <12 microg/l was found in 23.7% of studied girls. There were 47 girls (12.2%) with iron deficiency anemia (Hb<12 g/dl and ferritin <20 microg/l). Around 57.3% of anemic girls were iron deficient. There were no significant differences between the presence of anemia and the level of education of parents. The mean levels of hemoglobin (Hb), hematocrit (Hct), mean corpuscular volume (MCV), mean cell hemoglobin (MCH) and mean cell hemoglobin concentration (MCHC) in studied adolescent girls from Western Iran were found to be lower than those reported for females aged 12-18 years. In conclusion, regarding the detrimental long-term effects and high prevalence of iron deficiency, iron deficiency anemia and anemia in Kermanshah, Western Iran its prevention could be a high priority in the programs of health system of the country and supplementation of a weekly iron dose is recommended.

Publication Types:

- [Research Support, Non-U.S. Gov't](#)

PMID: 19055864 [PubMed - indexed for MEDLINE]

## **Determinants of anemia among preschool children in the Philippines.**

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**OBJECTIVE:** Our objective was to identify the determinants of anemia among rural Filipino children aged 12-71 months. **METHODS:** A cross-sectional survey was conducted among 2090 preschool children from 8 rural villages in Cebu, an area non-endemic for malaria and schistosomiasis. Hemoglobin (Hb) concentration was determined using a HemoCue hemoglobinometer and zinc protoporphyrin (ZPP) concentration was measured with a hematofluorometer. A 3-day non-consecutive 24-hour food recall interview with the child's primary caregiver was done to estimate the child's dietary intake. Stool analysis for presence of soil-transmitted helminths was performed through a concentration technique. A separate interview on household socio-economic status with the child's primary caregiver was conducted. **RESULTS:** Mean Hb concentration was 12.0 g/dL (SD 1.3). 16.1% were anemic. Age and sex had a significant interaction in their effect on Hb concentration. Females had higher Hb concentration between 12 to 23 months of age. Hb levels equalize between the 2 genders at around 24 months and increase with similar increments until 71 months of age. All dietary parameters improved Hb concentration with increasing intake. In the multiple regression, however, only the index for bioavailable iron and vitamin C intakes remained independent factors. None of the helminths or combination of helminths had significant effects on Hb concentration. Among the socio-economic variables, maternal educational attainment and water supply were significant independent factors. Mean ZPP concentration was 72.07 (SD 46.45) and 30.8% were iron deficient. As with Hb concentration, age and sex had a significant interaction in their effect on ZPP concentration, with females having lower ZPP levels before 24 months of age. Bioavailable iron (animal iron + 0.3\*plant iron) had a significant effect on ZPP concentration at levels of at least 15% of the iron requirement. This was seen even after controlling for multivitamin supplementation. **CONCLUSION:** The control of anemia among preschoolers can be achieved through a combination of various nutritional interventions such as micronutrient supplementation, food fortification and nutrition education. Our findings emphasize the importance of a multi-sectoral approach to nutritional problems--the importance of empowering women (through engagement and education) and of maintaining a healthy physical environment (water and sanitation) are often peripheral concerns of nutritionists. Our study highlights the importance of supporting initiatives that address these issues not only for their core benefit, but also for the potential benefit to nutrition.

PMID: 18689554 [PubMed - indexed for MEDLINE]

## **Iron and anemia in human biology: a review of mechanisms.**

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The biology of iron in relation to anemia is best understood by a review of the iron cycle, since the majority of iron for erythropoiesis is provided by iron recovered from senescent erythrocytes. In iron-deficiency anemia, storage iron declines until iron delivery to the bone marrow is insufficient for erythropoiesis. This can be monitored with clinical indicators, beginning with low plasma ferritin, followed by decreased plasma iron and transferrin saturation, and culminating in red blood cells with low-Hb content. When adequate dietary iron is provided, these markers show return to normal, indicating a response to the dietary supplement. Anemia of inflammation (also known as anemia of chronic disease, or ACD) follows a different course, because in this form of anemia storage iron is often abundant but not available for erythropoiesis. The diagnosis of ACD is more difficult than the diagnosis of iron-deficiency anemia, and often the first identified symptom is the failure to show a response to a dietary iron supplement. Confirmation of ACD is best obtained from elevated markers of inflammation. The treatment of ACD, which typically employs erythropoietin (EPO) supplements and intravenous iron (i.v.-iron), is empirical and often falls short of therapeutic goals. Dialysis patients show a complex pattern of anemia, which results from inadequate EPO production by the kidney, inflammation, changes in nutrition, and blood losses during treatment. EPO and i.v.-iron are the mainstays of treatment. Patients with heart failure can be anemic, with incidence as high as 50%. The causes are multifactorial; inflammation now appears to be the primary cause of this form of anemia, with contributions from increased plasma volume, effects of drug therapy, and other complications of heart disease. Discerning the mechanisms of anemia for the heart failure patient may aid rational therapy in each case.

Publication Types:

- [Review](#)

PMID: 18363095 [PubMed - indexed for MEDLINE]

**Iron deficiency causes duodenum mucosal hyperplasia in male Wistar rats.**

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Administration of an iron-deficient diet to Wistar rats resulted within 14 days in reduced serum iron concentrations, a microcytic hypochromic anemia, characteristic for impaired hemoglobin synthesis, and an increase of duodenal epithelial cell proliferation. After 5 weeks of iron deficiency, hypochromic microcytic anemia and a clear increase of duodenum weight but no pronounced effects on cell proliferation was observed. Increased duodenum weights corresponded to significant increases in mucosal area, indicating a diffuse, simple mucosal hyperplasia. The sequence of events following iron depletion thus appears to be: (1) reduced serum iron levels, (2) induction of hypochromic microcytic anemia, (3) increased duodenal epithelial cell proliferation, and (4) increased duodenal weight (increased mucosal area). Iron deficiency anemia was rapidly reversible after a 2-week recovery period. However, increased duodenum weights were still noted at that time. Intramuscular iron supplementation in animals fed with iron-deficient diet maintained body iron levels not below normal values, and neither anemia nor increased duodenum cell proliferation were detected after 14 days. A 5-week iron supplementation period resulted in slightly increased serum iron values, and slightly decreased duodenal epithelial cell proliferation. Thus, increased duodenum mucosal hyperplasia was shown to be secondary to depletion of body iron and anemia and reflects an attempt to increase iron absorption to counteract iron deficiency.

PMID: 18358645 [PubMed - indexed for MEDLINE]

## **Anemia and iron status in young fertile non-professional female athletes.**

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We evaluated the effects of regular physical exercise on anemia and iron status in young non-professional female athletes. A total of 191 healthy white Italian women (23.5 +/- 4.68 years) were analyzed; 70 were non-professional athletes performing 11.1 +/- 2.63 h week<sup>-1</sup> exercise and 121 were sedentary controls. Blood markers of anemia and iron status-hemoglobin (Hb), hematocrit (Hct), red blood cells (RBC), serum ferritin, iron, transferrin (Tf), transferrin saturation (TfS), soluble transferrin receptor (sTfR), and the sTfR/log ferritin ratio (sTfR-F index)-were evaluated. Anemia threshold was Hb < 120 g l<sup>-1</sup>. Ferritin concentrations < 12 microg l<sup>-1</sup> were considered as iron deficiency (ID). Frequency of anemia (15.7 versus 10.7%, P = 0.32), ID (27.1 versus 29.8%, P = 0.70), and ID anemia (8.6 versus 5.8%, P = 0.46) was not different in athletes and controls. However, athletes were threefold more likely than controls (17.1 versus 5.8%) to have serum iron < 50 microg dl<sup>-1</sup> [odds ratio (OR) 3.37, P = 0.012]. Low-TfS (<15%) was found in 25.7% of athletes and in 13.2% of controls, OR 2.27, P = 0.030. Elevated-sTfR (>1.76 mg l<sup>-1</sup>) was found in 24.3% of athletes and in 12.4% of controls, OR 2.27, P = 0.034. Regular non-professional sport activity does not cause an increased rate of anemia or of iron deficiency in fertile women. However, physical exercise has an impact on iron status as it reduces serum iron and transferrin saturation, and elevates sTfR. Nearly one fifth of recreational athletes have anemia and a third have iron deficit, these conditions can decrease their physical performance.

Publication Types:

- [Research Support, Non-U.S. Gov't](#)

PMID: 18092176 [PubMed - indexed for MEDLINE]

[Am J Nephrol](#). 2007;27(6):565-71. Epub 2007 Sep 5.

## **Nonhematological benefits of iron.**

### **Agarwal R.**

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Iron deficiency anemia is common in people with chronic kidney disease (CKD) and its importance in supporting erythropoiesis is unquestioned especially in those patients treated with erythropoietin. Clinical symptomatology such as fatigability, cold intolerance, failure to concentrate and poor effort intolerance is often attributed to anemia or uremia. That iron deficiency, per se, can cause these symptoms is poorly recognized. Clinical and animal studies that support the benefits of iron supplementation, independent of increasing hemoglobin, such as those on immune function, physical performance, thermoregulation, cognition, and restless leg syndrome and aluminum absorption is the subject of this narrative review. (c) 2007 S. Karger AG, Basel.

Publication Types:

- [Review](#)

PMID: 17804903 [PubMed - indexed for MEDLINE]

[Indian J Pediatr.](#) 2008 Apr;75(4):355-7. Epub 2008 May 18.

### **Iron deficiency anemia in an urban slum.**

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**OBJECTIVE:** Of this pilot study was to assess the iron status and dietary intake of 1-3 year-old apparently healthy toddlers of the lower socio-economic class, and the effect of eight weeks intervention with liquid oral iron in an urban slum in Pune, India. **METHODS:** 50 toddlers (M= 25, F= 25) with mean age of 2.4 years (SD 0.82) were evaluated. Anthropometry, Food Frequency Questionnaire, a hemogram and ferritin were measured. Twenty mg of elemental iron was given to all toddlers. After 8 weeks clinical examination, anthropometry, hemoglobin (HGB) and Ferritin were measured. **RESULTS:** Prevalence of anemia was 66% (HGB <11 gm %) and ferritin (iron stores) were low (< 12 microgm/L) in 45 (90%). After therapy prevalence of anemia was 30%. There was a significant difference in the HGB and ferritin levels of children after eight weeks of therapy ( $p < 0.001$ ). **CONCLUSION:** The prevalence of anemia decreased from 66 to 30% after treatment with liquid iron. We propose that all concerned in the care of toddlers should join the fight against anemia and prescribe iron to all toddlers when they are seen for minor ailments.

PMID: 18536890 [PubMed - indexed for MEDLINE]

[Med Hypotheses](#). 2008;70(1):70-2. Epub 2007 Jun 18.

### **Iron deficiency anaemia influences cognitive functions.**

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Many diseases, different nutritional, metabolic and hormonal changes, ageing and drugs can alter cognitive functions. Anemia via cerebral hypoxia and other possible mechanisms has been suggested to have a great influence on cognition. Iron deficiency anemia, the most common form of anemia, has been suggested to result in cognitive deterioration and alteration of neurological functions. Previous studies resulted in significant discrepancies considering correlation between anemia and cognitive achievement mainly because different or not sensitive enough tests used to measure cognition. We suggest a significant influence of iron deficiency anemia on dynamic properties and functional features of the central nervous system activity. Cognitive achievement is strongly related to hemoglobin level and could be expected in all patients. Higher hemoglobin level results in better CNS function. As a first step in confirming or refuting our hypotheses we suggest standardization of the method used to measure cognition, such as a very sensitive apparatus like Complex reactiometer Drenovac (CRD).

PMID: 17574345 [PubMed - indexed for MEDLINE]

[Zhonghua Yu Fang Yi Xue Za Zhi](#). 2008 May;42(5):339-41.

**[Anemia status and correlation factors in rural regions of Hebei province]**

[Article in Chinese]

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**OBJECTIVE:** To investigate anemia status and correlation infection factors in rural regions of Hebei province and to find out evidence for preventing and controlling anemia. **METHODS:** A random-sampling survey was conducted among 3367 houses in Hebei rural areas. The investigation involved economic levels, ages, education levels and occupations of 11,627 questionnaire. The hemoprotein and serum iron were measured. Unconditional logistic regression was performed. **RESULTS:** The anemia prevalence rate was shown up to 8.4% in rural regions of Hebei province, and in men and women was 5.5% and 11.0%, respectively;mainly in infant (< 2 years old, 27.2%) child bearing age women, the anemia prevalence rate was 11.0%-16.0%. The analysis showed that the main risk factors of anemia were sex and serum iron. **CONCLUSION:** The anemia prevalence is highest in infant and child bearing age women;supplying of iron should be an important measure for preventing and controlling anemia.

Publication Types:

- [English Abstract](#)

PMID: 18844084 [PubMed - indexed for MEDLINE]

**[Iron deficiency anemia and its importance in gastroenterology clinical practise]**

[Article in Serbian]

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Iron deficiency anemia (IDA) is a universal problem involving individuals of all ages and both sexes and is a common cause of referral to medical departments. This anemia is one of the most common types of anemia. IDA impairs growth and intellectual development in children and adolescent. In women IDA is most common in reproductive period because of menstrual and pregnancy iron losses. IDA affects roughly 10-30% of all pregnancies and, among others morbidities, may contribute of developing postpartum depression. Among other adult patient, chronic occult gastrointestinal bleeding is the leading cause of IDA.

Approximately, one third of patients with anemia have iron deficiency and up to two thirds of patients with IDA have serious gastrointestinal lesions detected with esophagogastroduodenoscopy and colonoscopy, including 10-15% with malignancy. However, in practice not all anemic patients undergo appropriate diagnostic tests to detect iron deficiency. Furthermore, a substantial proportion of patients with IDA do not undergo endoscopic evaluation. The approach to its investigation and subsequent therapy depends upon a comprehensive understanding of iron metabolism and heme synthesis. Once diagnosis of iron deficiency or IDA is established, evaluation for the cause of anemia must be appropriate performed and treatment must include corrective replenishment of body stores.

Publication Types:

- [English Abstract](#)
- [Review](#)

PMID: 17633868 [PubMed - indexed for MEDLINE]

**Nutritional factors associated with anaemia in pregnant women in northern Nigeria.**

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This study was conducted to assess the relative contribution of iron, folate, and B 12 deficiency to anaemia in pregnant women in sub-Saharan Africa. In total, 146 pregnant women, who attended two antenatal clinics in Gombe, Nigeria, were recruited into the study. The majority (54%) of the women were in the third trimester. Blood samples were obtained for determination of haematocrit and for measurement of serum iron, total iron-binding capacity, ferritin, folate, vitamin B12, and homocysteine. Malaria was present in 15 (9.4%) women. Based on a haemoglobin value of <105 g/L, 44 (30%) women were classified as anaemic. The major contributing factor to anaemia was iron deficiency based on the serum concentration of ferritin (<10 ng/mL). The mean homocysteine concentration for all subjects was 14.1 pmol/L, and homocysteine concentrations were inversely correlated with concentrations of folate and vitamin B 12. The serum homocysteine increased markedly at serum vitamin B12 levels below 250 pmol/L. The most common cause of anaemia in the pregnant women in northern Nigeria was iron deficiency, and the elevated concentrations of homocysteine were most likely due to both their marginal folate and vitamin B12 status.

Publication Types:

- [Research Support, N.I.H., Extramural](#)

PMID: 17615906 [PubMed - indexed for MEDLINE]

**Overview of clinical trials in the treatment of iron deficiency with iron-acetyl-aspartylated casein.**

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Iron therapy is necessary in a wide variety of clinical situations, and new formulations with improved tolerability and efficacy would be a welcome alternative to ferrous sulfate. A trivalent iron protein complex has been developed using an N-acetyl-aspartylated derivative of casein (Fe-ASP) for oral iron therapy. This paper provides an overview of the pharmacokinetic and clinical data on Fe-ASP use. To date, 704 paediatric and adult patients affected by iron deficiency anaemia with a wide variety of clinical histories (dietary, iron absorption defects, pregnancy, chronic or acute gastrointestinal haemorrhage) have been treated with Fe-ASP in 16 clinical trials including nine open and seven controlled trials. In healthy volunteers, Fe-ASP proved to be an efficient vehicle for providing iron with high bioavailability and more rapid and persistent increases in serum iron levels than ferritin. In open clinical trials, highly significant improvements in clinical and haematological parameters were observed after treatment with Fe-ASP in all categories of patients with iron deficiency anaemia. In controlled clinical trials, the changes in clinical and haematological profiles observed with Fe-ASP were virtually identical to those seen with iron protein succinylate (IPS), and Fe-ASP also compared well with parenteral iron gluconate. No safety considerations were raised. Fe-ASP shows high efficacy in iron-deficient anaemia treatment, and it is an extremely well tolerated iron vehicle. Fe-ASP represents a valid alternative to IPS and shows promise as a substitute for parenteral iron therapy in selected clinical situations.

PMID: 17532714 [PubMed - in process]

[Transfus Clin Biol](#). 2007 May;14(1):21-4. Epub 2007 May 11.

**[Iron deficiency anaemia: clinical presentation, biological diagnosis and management]**

[Article in French]

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The iron deficiency is the first cause of anaemia. In healthy young adult, anemia is well tolerated because of its progressive installation. The most common symptoms of anemia are pallor, fatigue and dyspnea. In biological exams, anemia is classically associated with microcytosis and hypochromia. The origins of microcytic anemia are iron deficiency, inflammatory aetiologies, thalassemia and sideroblastic anaemia. The iron-deficiency diagnosis includes two explorations: biological and clinical. The biological exploration is based on interpretation of serum biologic tests as blood iron, ferritin, transferrin with saturation, total iron-binding capacity and its soluble receptors. This interpretation is simple if it is not associated with clinical disorders influencing the internal iron cycle. The clinical exploration must always be followed by a careful assessment of the underlying cause as blood loss. The most common causes in women of reproductive age are gynaecologic. In men and menopausal women, the gastrointestinal tract bleeding is source of anemia. Therapeutic management of anemia is oral iron therapy. Etiological diagnostic of microcytosis is essential before iron therapy. If not, the treatment could be inefficient or it could mask or delay the etiological diagnostic.

Publication Types:

- [English Abstract](#)

PMID: 17499537 [PubMed - indexed for MEDLINE]

**[Concentration of ferritin, transferrin and iron as a markers of iron deficiency in healthy women in reproductive age]**

[Article in Polish]

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Iron deficiency anemia in pregnancy continues to be a clinical problem, which contributes to maternal and fetal morbidity. Iron store deficiency leads to iron deficient erythropoiesis and to negative iron balance when the iron supply is insufficient to maintain normal concentration of hemoglobin. The aim of this study was aimed to establish concentration of ferritin, transferrin and iron as a markers of iron deficiency in healthy women in reproductive age came for control examination to Institute of Mother and Child in Warsaw. MATERIAL AND METHODS: In serum of 108 healthy, multiparas in age up to 40 years from urban agglomerations, middle-class non-pregnant women concentration of iron, ferritin, transferrin and transferrin saturation were determined by commercially available kits (Hoffman-La Roche, Switzerland). RESULTS: Mean concentration of iron, ferritin and transferrin were among normal values. Low level of iron (below 49 microg/dl) was observed in serum of 12%, this of ferritin (below 20 ng/ml) in 22% and of transferrin (below 252 mg/dl) in 15% of studied women. Transferrin saturation lower than 15% was observed in 9 patients. The obtained values were age dependent. The lowest values of total iron were observed in the youngest group I (below 25 years old) and were accompanied with ferritin level below 20 ng/ml in 26% of women. Low ferritin values were also observed in serum of 22% patients of group II (25-35 years old) and only in 14% of women older than 35 years (group III). Saturation of transferrin lower than 15%, which indicated deficiency of iron for erythropoiesis, was observed in 26%, 13% and 19% patients of group I, II and III respectively. CONCLUSIONS: Obtained results indicated that in population of studied women in reproductive age, subclinical iron deficiency in 20% and negative iron balance in 10% could be observed. Therefore, iron status, especially store ferritin, should be assessed very carefully as a component of medical care.

PMID: 17477085 [PubMed - indexed for MEDLINE]

## **Inflammation and iron deficiency in the hypoferremia of obesity.**

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**CONTEXT:** Obesity is associated with hypoferremia, but it is unclear if this condition is caused by insufficient iron stores or diminished iron availability related to inflammation-induced iron sequestration. **OBJECTIVE:** To examine the relationships between obesity, serum iron, measures of iron intake, iron stores and inflammation. We hypothesized that both inflammation-induced sequestration of iron and true iron deficiency were involved in the hypoferremia of obesity. **DESIGN:** Cross-sectional analysis of factors anticipated to affect serum iron. **SETTING:** Outpatient clinic visits. **PATIENTS:** Convenience sample of 234 obese and 172 non-obese adults. **MAIN OUTCOME MEASURES:** Relationships between serum iron, adiposity, and serum transferrin receptor, C-reactive protein, ferritin, and iron intake analyzed by analysis of covariance and multiple linear regression. **RESULTS:** Serum iron was lower (75.8+/-35.2 vs 86.5+/-34.2 g/dl, P=0.002), whereas transferrin receptor (22.6+/-7.1 vs 21.0+/-7.2 nmol/l, P=0.026), C-reactive protein (0.75+/-0.67 vs 0.34+/-0.67 mg/dl, P<0.0001) and ferritin (81.1+/-88.8 vs 57.6+/-88.7 microg/l, P=0.009) were higher in obese than non-obese subjects. Obese subjects had a higher prevalence of iron deficiency defined by serum iron (24.3%, confidence intervals (CI) 19.3-30.2 vs 15.7%, CI 11.0-21.9%, P=0.03) and transferrin receptor (26.9%, CI 21.6-33.0 vs 15.7%, CI 11.0-21.9%, P=0.0078) but not by ferritin (9.8%, CI 6.6-14.4 vs 9.3%, CI 5.7-14.7%, P=0.99). Transferrin receptor, ferritin and C-reactive protein contributed independently as predictors of serum iron. **CONCLUSIONS:** The hypoferremia of obesity appears to be explained both by true iron deficiency and by inflammatory-mediated functional iron deficiency.

Publication Types:

- [Research Support, N.I.H., Extramural](#)

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PMCID: PMC2266872

**[Vulvar dermatitis and iron deficiency]**

[Article in French]

[Mateus C](#), [Franck N](#), [Leclerc S](#), [Brudv-Gulphe L](#), [Plantier F](#), [Dupin N](#).

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**BACKGROUND:** Many mucocutaneous signs associated with iron deficiency are described in the current dermatologic and haematologic literature but genital mucosa involvement has never been reported. **CASE REPORT:** We report a case of iron deficiency anaemia revealed by psoriasis-like vulvar dermatitis. The vulvar involvement dramatically improved after iron therapy. In the case reported herein, iron deficiency resulted from three mechanisms: increased loss (menorrhagia), inadequate dietary iron intake (vegetarian diet) and inadequate absorption (iron absorption inhibitors such as tea). **DISCUSSION:** Iron deficiency may be responsible for genital mucosa involvement. Iron deficiency investigation must determine the presence of blood loss and dietary habits (assessment of iron levels and ingestion of iron absorption inhibitors). Certain dietary recommendations are essential to avoid the failure of iron supplementation.

Publication Types:

- [Case Reports](#)
- [English Abstract](#)

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[Am Fam Physician.](#) 2007 Mar 1;75(5):671-8.

Erratum in:

- [Am Fam Physician.](#) 2008 Oct 15;78(8):914.

## **Iron deficiency anemia.**

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The prevalence of iron deficiency anemia is 2 percent in adult men, 9 to 12 percent in non-Hispanic white women, and nearly 20 percent in black and Mexican-American women. Nine percent of patients older than 65 years with iron deficiency anemia have a gastrointestinal cancer when evaluated. The U.S. Preventive Services Task Force currently recommends screening for iron deficiency anemia in pregnant women but not in other groups. Routine iron supplementation is recommended for high-risk infants six to 12 months of age. Iron deficiency anemia is classically described as a microcytic anemia. The differential diagnosis includes thalassemia, sideroblastic anemias, some types of anemia of chronic disease, and lead poisoning. Serum ferritin is the preferred initial diagnostic test. Total iron-binding capacity, transferrin saturation, serum iron, and serum transferrin receptor levels may be helpful if the ferritin level is between 46 and 99 ng per mL (46 and 99 mcg per L); bone marrow biopsy may be necessary in these patients for a definitive diagnosis. In children, adolescents, and women of reproductive age, a trial of iron is a reasonable approach if the review of symptoms, history, and physical examination are negative; however, the hemoglobin should be checked at one month. If there is not a 1 to 2 g per dL (10 to 20 g per L) increase in the hemoglobin level in that time, possibilities include malabsorption of oral iron, continued bleeding, or unknown lesion. For other patients, an endoscopic evaluation is recommended beginning with colonoscopy if the patient is older than 50.

Publication Types:

- [Review](#)

PMID: 17375513 [PubMed - indexed for MEDLINE]

## **Iron treatment normalizes cognitive functioning in young women.**

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**BACKGROUND:** Evidence suggests that brain iron deficiency at any time in life may disrupt metabolic processes and subsequently change cognitive and behavioral functioning. Women of reproductive age are among those most vulnerable to iron deficiency and may be at high risk for cognitive alterations due to iron deficiency. **OBJECTIVE:** We aimed to examine the relation between iron status and cognitive abilities in young women. **DESIGN:** A blinded, placebo-controlled, stratified intervention study was conducted in women aged 18-35 y of varied iron status who were randomly assigned to receive iron supplements or a placebo. Cognition was assessed by using 8 cognitive performance tasks (from Detterman's Cognitive Abilities Test) at baseline (n = 149) and after 16 wk of treatment (n = 113). **RESULTS:** At baseline, the iron-sufficient women (n = 42) performed better on cognitive tasks (P = 0.011) and completed them faster (P = 0.038) than did the women with iron deficiency anemia (n = 34). Factors representing performance accuracy and the time needed to complete the tasks by the iron-deficient but nonanemic women (n = 73) were intermediate between the 2 extremes of iron status. After treatment, a significant improvement in serum ferritin was associated with a 5-7-fold improvement in cognitive performance, whereas a significant improvement in hemoglobin was related to improved speed in completing the cognitive tasks. **CONCLUSIONS:** Iron status is a significant factor in cognitive performance in women of reproductive age. Severity of anemia primarily affects processing speed, and severity of iron deficiency affects accuracy of cognitive function over a broad range of tasks. Thus, the effects of iron deficiency on cognition are not limited to the developing brain.

Publication Types:

- [Randomized Controlled Trial](#)
- [Research Support, N.I.H., Extramural](#)
- [Research Support, U.S. Gov't, Non-P.H.S.](#)

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## **Iron-deficiency anemia as presentation of pouchitis.**

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**GOALS:** This study sought to describe the percentage and cause of anemia in patients who underwent ileal pouch with anal anastomosis (IPAA) for ulcerative colitis (UC), and to compare the distribution of complications in patients with and without anemia, especially pouchitis, after IPAA. **BACKGROUND:** IPAA is the surgical procedure of choice for UC. Complications include pouchitis (40%), strictures (30%), small bowel obstruction (10%), pelvic sepsis (<5%), and urinary and sexual dysfunctions (<5%). Few studies have described the prevalence of anemia after IPAA, but no conclusive findings have been reported. **STUDY:** Patients who had undergone IPAA for UC were recruited from the UPR Inflammatory Bowel Disease Clinic and the Gastroenterology Research Unit. Demographic and medical data were obtained. Anemia was diagnosed using standard hematologic criteria. Serum iron, ferritin, transferrin, folate, vitamin B12, erythropoietin, total iron-binding capacity, reticulocyte count, peripheral smear, and bone marrow aspirate were evaluated in patients with anemia. Data analysis was performed with EPI Info version 6.4d. **RESULTS:** Iron-deficiency anemia was identified in 55.5% (10/18) of patients and pouchitis was found in 77% (14/18). All 10 patients with anemia had pouchitis, whereas only 4 of the 8 without anemia had pouchitis. In half of the anemic patients, pouchitis was asymptomatic. **CONCLUSIONS:** Iron-deficiency anemia may be a clinical presenting sign of pouchitis. Hemoglobin levels may be considered as surveillance tools for pouchitis in patients with IPAA.

Publication Types:

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**Treatment response to standard of care for severe anemia in pregnant women and effect of multivitamins and enhanced anthelminthics.**

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**BACKGROUND:** Severe anemia (hemoglobin < 70 g/L) in pregnancy may increase the risk of maternal and perinatal mortality. **OBJECTIVES:** We assessed response to standard treatment with high-dose iron-folic acid for 90 d and single-dose (500 mg) mebendazole among severely anemic pregnant women in periurban Karachi, Pakistan. In addition, we evaluated the efficacy of 2 enhanced treatment regimens. **DESIGN:** We screened pregnant women (n = 6288) for severe anemia and provided them all with the standard treatment. To test the efficacy of 2 additional treatments, women were randomly assigned to standard treatment alone (control) or with 100 mg mebendazole twice daily for 3 d or 90 d of daily multivitamins or both using a 2 x 2 factorial design. **RESULTS:** Prevalence of severe anemia was high (10.5%) during pregnancy. Prevalence of geohelminths and malaria was low. Treatment response was defined as hemoglobin > 100 g/L at the 90-d or > or = 25 g/L at the 60-d follow-up visit. The standard-of-care treatment resulted in a response rate of 49% at follow-up, although an adherence of > or = 85% elicited a higher response (67%). The effect of the additional treatments was weak. Although response was higher in the enhanced groups than for the standard treatment at the final assessment, the differences were not statistically significant. However, hemoglobin concentration increased significantly in all groups and was higher in the enhanced mebendazole group compared with the standard group (P < 0.05). **CONCLUSIONS:** Iron deficiency was high in this population, and the standard-of-care treatment resulted in a treatment response of 50%, although better treatment adherence showed a higher response. Multivitamins and the enhanced mebendazole regimen had a modest benefit over and above the standard treatment.

Publication Types:

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