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Screening and Treatment for Iron Deficiency Anemia in Women: Results of a Survey of Obstetrician-Gynecologists

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Abstract

Objective—To better understand the knowledge, attitudes and practices of obstetrician-gynecologists with respect to screening and treatment for iron deficiency anemia (IDA).

Methods—A total of 1,200 Fellows and Junior Fellows of the American College of Obstetricians and Gynecologists were invited to participate in a survey on blood disorders. Respondents completed a questionnaire regarding their patient population, screening and treatment practices for IDA, and general knowledge about IDA and its risk factors.

Results—Overall response rate was 42.4%. Thirty-eight percent of respondents screen non-pregnant patients regularly, based on risk factors; 30.5% screen only when symptoms of anemia are present. For pregnant patients, 50.0% of respondents screen patients at their initial visit, while 46.2% screen every trimester. Sixty-one percent of respondents supplement pregnant patients when there is laboratory evidence of anemia; 31.6% supplement all pregnant patients. Forty-two percent of respondents screen post-partum patients based on their risk factors for IDA. However, when asked to identify risk factors for postpartum anemia, slightly more than half of respondents correctly identified young age and income level as risk factors for post-partum anemia; only 18.9% correctly identified pre-pregnancy obesity as a risk factor.

Conclusion—There are opportunities for increased education on IDA for obstetrician-gynecologists, specifically with respect to risk factors. There also appears to be substantial practice variance regarding screening and supplementation for IDA, which may correspond to variability in professional guidelines. Increased education on IDA, especially the importance of sociodemographic factors, and further research and effort to standardize guidelines is needed.

Keywords

Anemia; Anemia in pregnancy; Anemia in women; Iron defciency anemia

Compliance with Ethical Standards: Conflict of interest The authors report no conflict of interest.

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Introduction

Iron deficiency anemia (IDA) is a global health issue. The World Health Organization ranks IDA in the top-20 causes of disability-adjusted life-years lost, ahead of tuberculosis (World Health Organization 2013). Worldwide, the number of non-pregnant women affected by IDA is well over 400 million, making this the population group with the largest number of affected individuals (World Health Organization 2008). Prevalence of IDA among pregnant women worldwide is 41.8, and 30.2% among non-pregnant women (World Health Organization 2008). In the United States, monitoring of iron status is limited, but approximately 4% of women between the ages of 12 and 49 have IDA (Cusick et al. 2008). Among pregnant women in the United States, iron deficiency prevalence is 18.6%, and approximately 16% of these women are anemic (Mei et al. 2011). Racial and ethnic disparities exist, with 12% of black women and 8% of Mexican-American women being affected by IDA, as compared with 3% of non-Hispanic white women (Cusick et al. 2008).

IDA is associated with a number of adverse health consequences for both women and their children. IDA in pregnancy is associated with preterm delivery and low birth-weight (Scholl and Reilly 2000). IDA in pregnancy may also contribute to poorer cognitive development and IDA among children (Radlowski and Johnson 2013), and has been implicated in the development of post-partum depression (Albacar et al. 2011). A recent study showed that IDA was an independent risk factor for maternal transfusion, preterm delivery, 5 min APGAR less than seven, and NICU admission (Drukker et al. 2015), and associated a 1 g/dL increase in hemoglobin with an approximate 8% decrease in risk for Cesarean section (Drukker et al. 2015). Most cases of IDA are easily treated by dietary supplementation when identified (Johnson-Wimbley and Graham 2011).

Obstetrician-gynecologists are in a unique position to care for the general health of both pregnant and non-pregnant women. Given the importance of IDA as a health concern for women in general, and pregnant women, in particular, we investigated knowledge, attitudes and practices surrounding screening and treatment for IDA among obstetricians and gynecologists.

Materials and Methods

The American Congress of Obstetricians and Gynecologists (ACOG) selected 1200 fellows and junior fellows in current practice in December, 2009 to receive a survey questionnaire. Of these, 600 were members of the Collaborative Ambulatory Research Network (CARN), who voluntarily agree to participate in survey research. The additional 600 were randomly selected fellows and junior fellows outside of the CARN. The survey was mailed to recipients up to four times before they were counted as non-responders.

The survey included questions about physician demographics, training, practice characteristics, and patient population. Questions assessed self-reported practices for screening non-pregnant, pregnant and postpartum patients, supplementation of pregnant patients, and knowledge about IDA and risk factors. The survey questions did not specify a time-frame that they referred to, such as “for patients over the last year;” responses were

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therefore assumed to refer to a respondent's current practices, offering a cross-sectional view of practices in time. Physicians were also asked to rate the training they had received in medical school and residency, together, on IDA screening, assessment and treatment as comprehensive, adequate, barely adequate, inadequate, or nonexistent. These ratings were left undefined and were meant to assess how physicians felt their training on IDA in medical school and residency prepared them for practice, not as an objective measure of how much training on IDA they had actually received.

This project was approved by the ACOG institutional review board (IRB) and was approved on December 10, 2009, IRB #05. Statistical analysis was performed using SPSS (version 16, Chicago, IL).

Results

Of the 1200 eligible survey participants, 15 could not be reached. A total of 503 surveys were available for analysis, giving a total response rate of 42.4% (503/1185). Of these 503 respondents, 338 (67.2%) were CARN members. No differences in demographics were found between CARN responders and non-CARN responders in previous studies utilizing this survey data (Byams et al. 2012), allowing the samples to be combined for analysis.

Respondents had been in practice for a mean of 18.8 years, and a majority (72.6%) described their primary specialty as general obstetrics-gynecology (Table 1). Respondents most frequently reported that their patients lived in urban areas (40.9%), with non-Hispanic white patients, on average, making up the largest percentage of patients seen in respondents' practices (59.3%, Table 1).

The vast majority of physicians surveyed rated their training in each IDA-specific domain (screening, assessment and treatment) as either comprehensive or adequate. Absolute numbers of respondents rating their training as inadequate were small, with seven rating training on screening or treatment and six rating training on assessment as such. More respondents rated their training on assessment as barely adequate or inadequate than for screening or treatment (13.4 vs. 9.7 and 12.0%, respectively). No respondents rated their training on IDA as nonexistent.

Respondents most commonly reported screening non-pregnant and post-partum patients based on unspecified risk factors (Table 2), although several also reported screening all non-pregnant and post-partum patients regularly. Thirty percent (30.5%) of respondents reported screening non-pregnant patients only when patients were symptomatic, comparable to 28% of respondents who screen post-partum patients only when symptomatic (Table 2). Screening for pregnant women revealed a dichotomy in terms of when patients are screened, with half (50%) of respondents who reported that they see pregnant patients screening pregnant women at their initial visit and nearly half (46.2%) screening pregnant women every trimester (Table 2).

When responses to questions regarding screening were stratified based on subspecialty, only 30% of general gynecologists and 22.1% of general obstetrics-gynecology providers surveyed screen all non-pregnant patients regularly (Table 2). Small percentages of

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gynecologists and general obstetrics-gynecology practitioners reported that they do not regularly screen any patients for IDA. General obstetrics-gynecology practitioners are generally divided between those who report screening pregnant patients at the initial visit only (49.2%), and those who screen pregnant patients every trimester (47.1%, Table 2). No respondents reported “never” screening pregnant women, regardless of specialty.

When responses to questions on screening were stratified by how respondents ranked their training on screening, a higher percentage of those who rated their screening training as “barely adequate” reported that they screen non-pregnant patients based on symptoms, compared with those who rated their training in this area as comprehensive, adequate, or inadequate (Table 3).

A majority (61.9%) of respondents that answered a question regarding iron supplementation in pregnant women (n = 396) reported that they supplement pregnant patients only when there is laboratory evidence of anemia; 31.6% supplement all pregnant patients. Six physicians indicated that low-dose iron is typically part of their patients' prenatal vitamins and additional supplementation is reserved for evidence of anemia.

Eighty-nine percent (89.7%) of 468 respondents correctly identified altitude as a factor to consider when interpreting hemoglobin and hematocrit; 82.9% correctly identified smoking history as a factor. Only 38.9% of these respondents correctly identified race as a factor to account for in interpretation of results.

Risk factors for IDA in all women of reproductive age were well recognized by respondents. A diet poor in iron and heavy menses were the most well recognized risk factors, with 96.1 and 95.3% of respondents correctly identifying these; over 85% of respondents identified gastrointestinal disease affecting absorption and short interpregnancy interval as risk factors, while 84.8% recognized heavy blood loss during vaginal delivery. A short interpregnancy interval was correctly identified as a risk factor by fewer respondents who rated their training in the assessment domain as barely adequate (77.0%) or inadequate (60.0%), and only 40.0% of those who rated their training as inadequate recognized heavy blood loss during vaginal delivery as a risk factor.

Risk factors for post-partum anemia were correctly recognized by smaller proportions of the responding sample. While third trimester anemia was identified as a risk factor for post-partum anemia by 95.4% of respondents answering this question, multiparity was recognized by 73.2%, young age by 57%, income level by 56.2%, and pre-pregnancy obesity by only 18.9%. Identification of risk factors for postpartum anemia was lower in the group that rated their training on assessment as inadequate, with 83.3% recognizing third trimester anemia, 50% recognizing multiparity, 50% young age, and 33.3% income level.

Comment

This survey on knowledge, attitudes and practices regarding IDA among obstetrician-gynecologists identified gaps in some knowledge areas, suggesting opportunities for increased education in these areas, and identified practice pattern variations that may be influenced by available recommendations.

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Answers of survey respondents to knowledge questions suggest that there is room for improvement in education about IDA, specifically regarding identification of risk factors. Although the number of physicians rating their training as inadequate was small, these physicians less commonly identified risk factors. Physiologically-based risk factors clearly receive emphasis in medical school and residency and are easily recognized. Nearly 85% of respondents correctly identified risk factors for IDA among reproductive aged women of all races, all of which are related to iron or blood physiology. However, fewer respondents correctly identified socio-demographic risk factors. For example, about half of respondents did not identify income and educational levels as risk factors for post-partum IDA. Similarly, race was recognized by less than half of respondents as a consideration in interpreting hemoglobin results, while physiologic factors, like smoking or altitude, were recognized by over 80% of respondents. This suggests that increased discussion of socio-demographic parameters and the influence of socio-demographic variables on health may be warranted in the education of obstetrician-gynecologists, at least with respect to IDA. Additionally, since many respondents to our survey report screening non-pregnant and postpartum patients based on risk factors, it is imperative that providers recognize as many of those risk factors as possible in order to facilitate screening.

Results from this survey indicate that, where there are unclear or conflicting recommendations, there are varied and conflicting practices. CDC and the Institute of Medicine (IOM) recommend that all women of childbearing age in the United States be routinely screened for IDA every 5–10 years without risk factors, and annually with risk factors (Centers for Disease Control and Prevention 1998, Institute of Medicine 1993). However, ACOG and USP-STF, which have published recommendations on screening pregnant women (American College 2008; United States Preventive Services Task Force 2015), have not issued guidelines for screening nonpregnant women. Because many women of childbearing age visit gynecologists regularly, these practitioners are uniquely positioned to provide screening services to these women, regardless of their pregnancy status. In our survey, only a third of gynecologists and 22.1% of obstetrician-gynecologists screen nonpregnant patients regularly; 30.5% of respondents screen for IDA in nonpregnant women only when they are symptomatic. Screening nonpregnant patients based on risk factors was reported more commonly. Another 3.9% do not screen any patients for IDA as part of routine gynecologic visits—and this number is mostly made of up of general practitioners within the field of obstetrics-gynecology.

ACOG (American College 2008), IOM (Institute of Medicine 1993) and CDC (1998) recommend screening asymptomatic pregnant women for IDA, while the most recent update to USPSTF recommendations finds insufficient evidence to endorse doing so (United States Preventive Services Task Force 2015). Neither ACOG nor CDC recommendations provide information regarding when in pregnancy to screen and whether to screen at multiple points in a pregnancy, despite the fact that prevalence of IDA increases across trimesters (Mei et al. 2011, 15). IOM guidelines recommend screening each trimester. Accordingly, while the majority of respondents reported screening pregnant patients, half of these providers screen at the initial pregnancy visit, while half screen every trimester.

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Conflicting recommendations exist for supplementation practices, as well. Although the USPSTF found insufficient evidence to recommend for or against routine iron supplementation in pregnancy (United States Preventive Services Task Force 2015), CDC recommends universal supplementation for pregnant women (Centers for Disease Control and Prevention 1998). ACOG guidelines note that iron supplementation in pregnancy decreases the prevalence of maternal anemia at delivery, but overtly recommend supplementation only for women with IDA (American College 2008). IOM guidelines endorse supplementation based on hematologic parameters (Institute of Medicine 1993). Nearly a third of respondents to our survey follow CDC recommendations, while 61.9% supplement when anemia is present.

Although we did not ask practitioners whether they are aware of guidelines for IDA screening or supplementation, or what guidelines they follow, practice variation is apparent and suggests that providers may be following any one of the many different guidelines. These instances indicate the need for further research, both to gain a better understanding of physicians' familiarity with the guidelines and how guidelines are incorporated into clinical practice, and to identify the most beneficial practices regarding screening and supplementation of pregnant women. Large numbers of women may be undergoing differential screening and supplementation. Risks and benefits for these women could be identified to drive standardization of recommendations. The USPSTF, in its most recent update to recommendations, acknowledges the dearth of research in the United States population leading to an inability to fully weigh risks and benefits of both screening and supplementation practices (United States Preventive Services Task Force 2015).

Further research, however, is unlikely to address the wide variability in practice patterns for IDA in the short-term. A reasonable solution could be for stakeholders, including CDC, ACOG, IOM and USPTF members, to discuss the evidence base jointly and develop a single set of mutually acceptable recommendations, although this would require coordination and buy-in at the stakeholder level. More widespread recognition that variable recommendations influence the practice patterns of obstetrician-gynecologists may lend a sense of urgency to the development of standardized recommendations. At the educational level, alerting obstetrics and gynecology physicians-in-training to the multiple and sometimes conflicting recommendations could allow more familiarity with recommendations and potentially drive further research.

This study has limitations. As a self-reported survey, responses may represent biased estimates as opposed to objective data on a participant's practice. The overall response rate for this survey is low at 42.4%, and respondents may be intrinsically different than non-respondents. While approximately two-thirds of respondents were CARN members of ACOG, CARN membership is managed in order to provide demographic representativeness with ACOG fellows as a whole; ACOG, in turn, represents approximately 90% of US obstetrician-gynecologists. Additionally, the sample size of those physicians rating their training as “inadequate” is small (n = 7) and conclusions about this group should be viewed with caution. The proportion of these physicians who appear to follow recommended screening practices may be artificially elevated above the proportions of physicians rating their training differently because of the sample size; alternatively, physicians who feel that

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they received an inadequate amount of training in a particular domain may have put more effort into independently studying the various recommendations, and may truly be more familiar with them. Importantly, a limitation of our survey is that it did not ask practitioners whether they are aware of guidelines for IDA screening or supplementation, or what guidelines they follow, if any; this limits the ability to draw firm conclusions about the influence of a diversity of professional recommendations regarding IDA, although the variability of practice patterns reported does appear to align with various specific recommendations.

In conclusion, practitioners of obstetrics and gynecology are in a unique position to provide screening, education, and treatment for IDA in women, which continues to contribute to morbidity among women of childbearing age in the United States. The survey results reported here, from fellows and junior fellows of ACOG, indicate that while training on IDA generally provides an appropriate knowledge base for practitioners, there are areas where increased education could improve practice; there are also practice variations in both screening and supplementation for IDA. Education should stress the variability of recommendations for screening and supplementing non-pregnant and pregnant women, and should highlight sociodemographic influences on IDA, especially given that much screening takes place on the basis of whether risk factors, many of which are socidemographic, are present. Finally, further research regarding screening and supplementation practices is needed to allow for wider standardization of guidelines.

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Significance

Iron deficiency anemia is a major cause of morbidity for women of childbearing age, but little is known about knowledge, attitudes and practices related to screening for and treatment of this condition. This study provides insight into the practice patterns of American obstetrician-gynecologists.

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Table 1
Participant and practice characteristics (n = 503)

Characteristic	n or mean	Percent or SD *
Birth year (mean)	1957	SD = 10.5
Gender		
Male	257	51.1
Female	246	48.9
Years in practice since residency (mean)	18.8	SD = 10.4
Current practice		
Solo practice	89	17.7
Health maintenance organization	10	2.0
Obstetrics-gynecology partnership/group	232	46.1
University full-time faculty and practice	60	11.9
Multi-specialty group	63	12.5
Other	46	9.1
Primary medical specialty		
General obstetrics-gynecology	365	72.6
Maternal-fetal medicine	29	5.8
Obstetrics only	3	0.6
Reproductive endocrinology	8	1.6
Gynecology only	81	16.1
Other	13	2.6
Residence of patients		
Urban	206	40.9
Suburban	166	33.0
Mid-sized town	73	14.5
Rural	36	7.2
Military	10	2.0
Other	3	0.6
Percent of patient race/ethnicity in practice (mean)		
Non-Hispanic White	59.3	SD = 27.0
Hispanic	16.4	SD = 20.3
African-American	14.8	SD = 15.3
Native American	1.5	SD = 7.1
Asian/Pacific Islander	4.9	SD = 8.3
Other	2.2	SD = 9.5
Patients seen each week (mean)	83.1	SD = 40.6

SD standard deviation

* Some columns do not total 100% because of missing responses

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Table 2
Screening practices of respondents, total and stratified by subspecialty type

Screening practice	Overall n (%)	Sub-specialty n (%)		
	(n = 503)	Maternal-fetal medicine (n = 29)	Gynecology only (n = 81)	Obstetrics-gynecology (n = 365)
Non-pregnant patients	*n = 482*	*n = 22*	*n = 80*	*n = 358*
Based on risk factors	194 (40.2)	4 (18.2)	36 (45.0)	147 (41.1)
When symptoms present	147 (30.5)	4 (18.2)	16 (20.0)	119 (33.2)
All regularly	122 (25.3)	13 (59.1)	24 (30.0)	79 (22.1)
No patients screened	19 (3.9)	1 (4.5)	4 (5.0)	13 (3.6)
Pregnant patients	*n = 488*	*n = 27*	*n = 80*	*n = 358*
Do not see pregnant patients	118 (23.5)	1 (3.7)	74 (92.5)	27 (7.5)
	n = 370	*n = 26*	*n = 6*	*n = 331*
Initial visit	185 (50.0)	16 (61.5)	2 (33.3)	163 (49.2)
Every trimester	171 (46.2)	9 (34.6)	4 (66.7)	156 (47.1)
When symptoms present	14 (3.8)	1 (3.8)	—	12 (3.6)
Postpartum patients	*n = 397*	*n = 25*	*n = 13*	*n = 348*
Based on risk factors	170 (42.8)	14 (53.8)	5 (38.5)	147 (42.2)
When symptoms present	111 (28.0)	5 (19.2)	—	105 (30.2)
All regularly	98 (24.7)	6 (23.1)	6 (46.2)	81 (23.3)
No patients screened	18 (4.5)	1 (3.8)	2 (15.4)	15 (4.3)

Subspecialties reproductive endocrinology, obstetrics only and “other” not included in table; each of these categories had fewer than 15 respondents. Rows may not total to 100% because of the exclusion of these subspecialty categories

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Table 3

Screening practices of respondents, stratified by rating of education in screening domain

Screening practice	Rating of education (screening domain) n(%)			
	Comprehensive (n = 148)	Adequate (n = 296)	Barely adequate (n = 41)	Inadequate (n = 7)
Non-pregnant patients	*n = 145*	*n = 290*	*n = 41*	*n = 7*
Based on risk factors	64 (44.1)	112 (38.6)	14 (35.9)	3 (42.9)
When symptoms present	40 (27.6)	88 (30.3)	17 (43.6)	2 (28.6)
All regularly	37 (25.5)	76 (26.2)	7 (17.9)	2 (28.6)
No patients screened	4 (2.8)	14 (4.8)	1 (2.6)	—
Pregnant patients	*n = 146*	*n = 293*	*n = 41*	*n = 7*
Initial visit	63 (43.2)	110 (37.5)	10 (24.4)	2 (28.6)
Every trimester	55 (37.7)	97 (33.1)	15 (36.6)	4 (57.1)
When symptoms present	2 (1.4)	11 (3.8)	1 (2.4)	—
Do not see pregnant patients	26 (17.8)	75 (25.6)	15 (36.6)	1 (14.3)
Postpartum patients	*n = 128*	*n = 231*	*n = 32*	*n = 6*
Based on risk factors	58 (45.3)	93 (40.3)	16 (50.0)	3 (50.0)
When symptoms present	43 (33.6)	61 (26.4)	7 (21.9)	—
All regularly	25 (19.5)	63 (27.3)	8 (25)	2 (33)
No patients screened	2 (1.6)	14 (6.1)	1 (3.1)	1 (16.7)