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Clinical Scenario

Pregnant women have an increased need for iron that might not be met with diet alone. Due to physiologic anemia and population differences, no set criteria for defining iron deficiency anemia (IDA) are available globally. Serum ferritin and transferrin levels are often used to guide therapy by clinicians. Studies have reported an association between poor iron status and negative health outcomes such as low birth weight, premature birth, and perinatal death for women and their infants, although the evidence is weak.

Keywords: Anemia, iron, pregnancy

Background

Prenatal screening for IDA and routine iron supplementation may allow clinicians to diagnose and preemptively treat iron deficiency and IDA in pregnant women, leading to a decreased risk of future negative health outcomes. However, there is a lack of one consistent set of guidelines that can be applied safely to all populations globally. These guidelines will let clinicians deliver the most efficient care to their patients. One such effort was made by the United States Preventive Services Task Force (USPSTF), which last reviewed evidence on prenatal screening for IDA in 2006 and recommended routine screening on the basis of fair-quality evidence. According to the USPTF, although there is insufficient evidence for screening asymptomatic or treating nonanemic asymptomatic pregnant women, treatment of asymptomatic IDA has moderate health benefits. This summary reports the evidence for routine screening and iron supplementation for IDA in nonsymptomatic pregnant women.

How was the Study Done?

Researchers from the USPSTF conducted a systematic review and meta-analysis of studies reporting routine screening and iron supplementation for asymptomatic (anemic and nonanemic) women and the intervention's effect on any health outcomes for women and infants.

The review included randomized controlled trials, nonrandomized, controlled trials and cohort studies including asymptomatic pregnant women receiving screening or supplementation for IDA, and the studies were in English. When good- and fair-quality studies were available, poor-quality studies were excluded as were studies only published with abstracts or without original data. The review focused on studies using iron supplementation and treatment regimens commonly used in clinical practice in the United States and those conducted in countries with "high" or "very high" human development based on the United Nations's Human Development Index.

How was Quality of Evidence Assessed?

Study quality was assessed by the two reviewers who used predefined criteria set by the USPSTF, which rates study quality as good, fair, or poor. Discrepancies were addressed by consensus.

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Table 1: Summary of pooled results

Intervention	Outcome	Effect estimate	Heterogeneity	Quality
Routine iron supplementation versus no supplementation or placebo	Preterm delivery (defined as delivery at <37 weeks)	#RR 0.88 (95% *CI: 0.55, 1.42) Two studies, *n*=1,010	χ^2 *P* 0.38; I I^2 0%	Fair
	Low birth weight (defined mostly as <2500 g)	RR 1.10 (95% CI: 0.54, 2.25) Three studies, *n*=688	χ^2 *P* 0.45; I I^2 0%	Fair
	IDA (defined as hemoglobin level <110 g/L and serum ferritin level <27 pmol/L or <44.9 pmol/L)	RR 0.29 (95% CI: 0.17, 0.49) Four studies, *n*=762	χ^2 *P* 0.55; I I^2 0%	Fair
	Iron deficiency (defined as serum ferritin level <27 pmol/L, <33.7 pmol/L, or <44.9 pmol/L)	RR 0.53 (95% CI: 0.33, 0.84) Three studies, *n*=510	χ^2 *P* 0.20; I I^2 40%	Fair

*CI: Confidence interval; #RR: Risk ratio

What did the Study Find?

After conducting a thorough search, researchers from the USPSTF selected 12 trials that compared the effects of routine prenatal iron supplementation versus no supplementation. No trials reporting on the benefits or harm of routine screening on pregnant, maternal, or infant health outcomes were found. Evidence from new trials supports the previous findings of routine supplementation improving maternal IDA and other blood indices. However, there is still insubstantial evidence for the effect of routine iron supplementation or screening on maternal or infant health outcomes as reported in Table 1. This means that the current evidence supports the previous USPTF recommendations of routine prenatal iron supplementation. Studies included were of good and fair quality; however, due to low number of trials, there is a lack of generalizability, no consistent amount of iron dose used, and clinical outcomes mostly reported as *ad hoc* events.

Implications for Clinical Practice

Evidence supports routine supplementation in terms of maternal hematologic health but does not have any impact on maternal and infant clinical health outcomes. For the second question, evidence was not strong enough to support or oppose the effect of routine screening on anemic and nonanemic women in terms of future health benefit(s) or harm(s) for the involved woman or infant. For physicians, the message is that routine supplementation of iron during pregnancy does improve hematologic markers in women reducing future risk of IDA, so it should be continued. However, routine screening for IDA in asymptomatic women may or may not be conducted since there is still a lack of sufficient evidence to develop a recommendation for this procedure.

Implications for Research

The previous USPTF report identified certain research gaps that included whether routine iron supplementation and IDA screening impacted future clinical outcomes of women and their children as well as whether routine IDA screening should be implemented in asymptomatic women. This report, albeit able to corroborate the findings for routine iron supplementation, found inadequate evidence for routine IDA screening and did not address whether routine IDA screening will impact the hematologic indices of asymptomatic women. These gaps need to be filled with strong long-term clinical trials needed to evaluate the effect of screening and routine iron supplementation on maternal and infant short- and long-term health outcomes. Trials need to be conducted on a large scale in high-, middle-, and low-income countries that focus on certain regimens, stratify populations based on risk factors, and are powered to report clinical outcomes.

Conclusion

Trials support the use of routine iron supplementation in anemic and nonanemic asymptomatic pregnant women; however, there is a lack of evidence for or against routine screening in this population.

This evidence-based summary is based on Cantor 2015.[1]

Reference

1. Cantor AG, Bougatsos C, Dana T, Blazina I, McDonagh M. Routine iron supplementation and screening for iron deficiency anemia in pregnancy: A systematic review for the U.S. Preventive Services Task Force. Ann Intern Med 2015;162:566-76.

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