Pica:

Its Frequency and Significance in Patients with Iron-deficiency Anemia Due to Chronic Gastrointestinal Blood Loss

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Purpose: *Pica, particularly ice-eating (pagophagia), is a recognized symptom of iron deficiency. The value of pica as a clue to the etiology of blood loss has never been studied.*
Patient population: *Fifty-five unselected patients with iron-deficiency anemia due to gastrointestinal blood loss evaluated by a gastroenterology referral service at a city hospital.*
Results: *The patients' mean hematocrit was 26 ± 15% (SD). Thirty two (58%) had pica, and in 28 (88%) it manifested as pagophagia. Pica was present significantly more often in women (19/32, 68%) than in men (9/23, 39%, $p<0.05$). Pica occurred less frequently in patients with malignancy (2/9 vs. 30/46), but this difference was not significant.*
Conclusion: *Pica, a frequent symptom in patients with iron-deficiency anemia due to gastrointestinal blood loss, particularly women, is not of value in predicting the cause of bleeding.*
Key words: *iron; iron-deficiency anemia; pica.* J GEN INTERN MED 1989;4:512–513.

PICA is a well-recognized symptom of iron deficiency, both in patients with and in patients without anemia.[1-5] Patients who have iron deficiency may crave both food items and non-food substances, especially ice (pagophagia). Prior studies have emphasized the occurrence of pica and in particular the frequency of pagophagia.[1-5] However, the patients in these studies have mainly been adult women with excessive menstrual blood losses and adult patients with polycythemia vera treated by repeated phlebotomy.[2-4] Chronic gastrointestinal blood loss is responsible for iron deficiency in many adult patients and is of particular concern because it may be a marker of gastrointestinal malignancy.[6] The purposes of this study were to evaluate the frequency of pica in patients with iron-deficiency anemia and to determine the clinical features of such patients, and particularly the relationship of gastrointestinal malignancy to the occurrence of pica.

METHODS

Subjects of the study were 55 unselected patients prospectively evaluated for iron-deficiency anemia associated with gastrointestinal blood loss over a year's time by the author on a gastroenterology referral service at a city hospital. Iron-deficiency anemia was established by the presence of a subnormal hemoglobin concentration (women <12 g/100 ml, men <14 g/100 ml) and a serum iron saturation <10%. Gastrointestinal blood loss was established either by the appearance of gross blood or by the observation of a positive guaiac reaction (Hemoccult) in the stool.

The nature of the gastrointestinal evaluation was determined by the patient's symptoms. The colon was evaluated either by flexible sigmoidoscopy with air-contrast barium enema or by colonoscopy. The upper gastrointestinal tract was evaluated by esophagogastroduodenoscopy or a barium meal, and the remainder of the small intestine was evaluated by means of a small bowel series. The work-up was suspended upon discovery of a probable bleeding site and was resumed only if bleeding continued despite appropriate therapy. All patients in whom no source of bleeding was found underwent esophagogastroduodenoscopy, colonoscopy, and a small bowel series.

All patients were interviewed by the author. Pica was defined as the recent onset of an appetite for ice (≥1 cup/day), dirt or clay, laundry starch, or any other item for which the patient was able to identify a recent craving that resolved with iron treatment.

Means were expressed ±1 standard deviation and compared using the unpaired t-test. Group frequencies were compared by chi-square analysis using Yates' correction factor or by Fisher's Exact Test. A significance level of 0.05 was selected.

RESULTS

The mean age of the patients was 53 ± 15 years. There were 28 women and 27 men. The mean hematocrit, corpuscular volume, and iron saturation of the group were 26 ± 8%, 68 ± 15 fl, and 5 ± 6%, respectively.

Thirty-two of the 55 patients (58%) had pica. In 28 of these subjects (88%), the pica manifested as pagophagia. The other three patients had developed cravings for sugar (2), dirt (1), and salted peanuts (1). Of four patients who were edentulous, three nevertheless craved ice.

The causes of gastrointestinal blood loss are shown in Table 1. The most commonly identified causes were gastrointestinal tumors, esophagitis, prior partial gastrectomy, and peptic ulcer disease.

Pica occurred more frequently in women (Table 2). The frequency of pica in patients with metastatic malignancies was less than that in patients without ma-

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lignancy, but not significantly so (2/9 vs. 30/46). The ages and hematologic indices of patients with and without pica were similar.

DISCUSSION

The principal non-hematologic effect of iron deficiency is perversion of the appetite. As Crosby has emphasized, patients with iron deficiency do not volunteer a history of pica, regarding it as an idiosyncrasy rather than a symptom.[1,7] Pica reportedly occurs in approximately 50% of such patients.[1-5] The commonest substance for which the iron-deficient patient develops a craving is ice. Occasionally, pagophagia becomes so severe as to require an expanded ice-making capacity in the freezer and may even cause dental injury. However, absence of teeth and the inability to chew ice does not prevent pagophagia. Three of the four edentulous, iron-deficient patients in this study sucked on ice. A variety of other compounds, both foodstuffs and nonfood items, have been consumed by patients with pica.[7] Cravings for sugar were present in two patients in this report, a form of pica not previously described.

TABLE 1

Causes of Blood Loss and Frequency of Associated Pica

	Patients	
	No.	No. Pica (%)
Gastrointestinal tumor	12	4 (33)
Colonic cancer	6*	0 (0)
Colonic polyp	4	3 (75)
Gastric lymphoma	1	0 (0)
Gastric polyp	1	1 (100)
Esophagitis	6	4 (67)
Post-gastrectomy	6	3 (50)
Normal mucosa	5	2 (40)
Marginal ulcer	1	1 (100)
Peptic ulcer disease	5	4 (80)
Duodenal ulcer	3	3 (100)
Gastric ulcer	2	1 (50)
Inflammatory bowel disease	3	2 (67)
Crohn's disease	2	1 (50)
Ulcerative colitis	1	1 (100)
Hemorrhoids	3	3 (100)
Metastatic carcinoma (? source)	2	2 (100)
Etiology unknown	9	5 (56)
Rendu-Osler-Weber syndrome	2	1 (50)
Esophageal varices	1	1 (100)
Koch pouch ulceration	1	1 (100)
Pancreatic rest	1	0 (0)
Radiation colitis	1	1 (100)
Gastritis	3	1 (33)
TOTAL	55	32 (58)

*All metastatic at time of diagnosis.

TABLE 2

Characteristics of Patients with and without Pica

	Patients with Pica	Patients without Pica
Age	51 ± 2 years	56 ± 3 years
Women†	19/32	9/23*
Prior weight loss (>5 lb)	11/32	11/23
Hematocrit	26 ± 2%	27 ± 2%
Mean corpuscular volume	67 ± 2 fl	71 ± 2 fl
Saturation of iron-binding protein	5 ± 1%	6 ± 1%

*$p<0.05$ vs. patients with pica.

Pica is clearly caused by iron deficiency in that it occurs in iron-deficient patients and is relieved by iron therapy. Anemia is not a requirement for pica.[4] Nonanemic, iron-deficient patients may develop pica. Moreover, pica is cured by iron therapy in anemic patients before the blood count improves. The mechanism by which iron deficiency produces pica is unknown.[8]

The form of iron deficiency about which the internist has the greatest concern is that associated with chronic gastrointestinal blood loss, owing to the possibility of gastrointestinal malignancy, particularly in the colon. Pica occurred in over 50% of such patients in this report, a frequency similar to that described for iron-deficient menstruating women and patients with polycythemia vera treated by phlebotomy.[2-4] Pica was significantly more frequent in women than in men, as has previously been observed in other settings. Although the frequency of pica was less in patients with malignancy than in other patients, the difference was not significant. The number of patients with malignancies in this study was small, and it is possible that a study of a larger group of patients would find a significant difference in the frequency of pica in such patients compared with other iron-deficient patients. However, at present, the absence of pica in an iron-deficient patient cannot be taken as an indication of underlying malignancy.

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