IN PRACTICE

Determination of iron status in women attending genitourinary clinics with pruritus vulvae

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Objective: To compare iron status in women with pruritus vulvae and in asymptomatic controls.

Methods: 42 women with pruritus vulvae and 42 asymptomatic broadly age-matched controls were enrolled in this prospective study. The outcome measures assessed were serum iron, serum ferritin, total iron-binding capacity, haemoglobin and transferrin saturation.

Results: 12 (29%) participants and 10 (24%) controls were iron deficient; 1 (2%) participant and 1 (2%) control had laboratory-defined iron deficiency anaemia. Participants generally had lower levels of iron markers than controls, with differences (95% confidence interval (CI)) of $-3.5 \mu\text{g/l}$ (-9.89 to 6.99) for serum ferritin ($p=0.73$), -4.9 mmol/l (-8.12 to 0.12) for serum iron ($p=0.06$) and -5.5 mmol/l (-5.75 to 1.46) for total iron-binding capacity ($p=0.24$). No significant difference in haemoglobin or mean cell volume was shown between the two groups (haemoglobin: $p=0.17$, 95% CI -0.83 to 0.15 ; mean cell volume: $p=0.15$, 95% CI -4.59 to 0.73).

Conclusion: This study does not provide evidence to support the routine determination of iron status in patients presenting to genitourinary medicine clinics with pruritus vulvae from all causes.

Pruritus vulvae is a condition caused by a variety of factors including infection, dermatoses and premalignant conditions. When no underlying cause is established, the condition is referred to as idiopathic pruritus vulvae.

Iron deficiency has been associated with both generalised and localised pruritus, with relief of symptoms shortly after starting iron replacement treatment.^{1–4} Although national guidelines on the management of vulval conditions suggest only estimation of serum ferritin in women with vulval dermatitis,⁵ this test is commonly performed in women presenting with pruritus vulvae of any aetiology.

METHODS

The project was approved by South Sheffield Research Ethics Committee.

Women presenting to the department of genitourinary medicine with vulval itching on most days for ≥ 1 month or with four or more episodes of itching and requiring treatment within the past year were invited to participate. A control group of asymptomatic women was selected, half of whom were aged ≥ 35 years, reflecting the age distribution of participants.

Informed consent was obtained, and all examinations were undertaken by one of the two investigators. Blood samples were taken to assess serum ferritin, serum iron, total iron-binding capacity, transferrin saturation and a full blood

count. A high vaginal swab and a vulval swab from the site of maximum irritation were sent for culture.

The sample size of 42 in each group had a 90% power to detect a difference in serum ferritin means of $25 \mu\text{g/l}$ by assuming a common standard deviation of 34, using a two-group t-test with a 0.05 two-sided significance level.

RESULTS

A total of 24 (57%) participants had an infection in at least one site compared with 30 (71%) controls. Rates of candida infection were identical between the two groups (31%), but β -haemolytic streptococci were cultured more frequently in the participants (24%; controls, 2%), and anaerobic infection was more common among controls (48%; participants, 24%).

Skin changes were recorded in 26 (62%) participants and 5 (12%) controls. The most common finding among participants was vulvitis (52%); 7 (17%) participants had evidence of excoriation, 6 (14%) had fissuring and 4 (10%) had lichen simplex.

A total of 16 (38%) participants reported itching at a site other than the vulva, and 5 (12%) participants reported generalised pruritus.

A trend towards lower serum iron levels in participants did not reach significance compared with controls (differences (95% confidence interval (CI)) for serum iron, -4.9 mmol/l (-8.12 to 0.12), $p=0.06$; total iron-binding capacity, -5.5 mmol/l (-5.75 to 1.46), $p=0.24$; and serum ferritin, $-3.5 \mu\text{g/l}$ (-9.89 to 6.99), $p=0.73$).

In all, 12 (29%) participants and 10 (24%) controls had iron deficiency, defined as a low ferritin or transferrin saturation; 1 (2%) participant and 1 (2%) control had laboratory defined iron deficiency anaemia.

No difference in haemoglobin or mean cell volume was shown between the two groups (haemoglobin: $p=0.17$, 95% CI -0.83 to 0.15 ; mean cell volume: $p=0.15$, 95% CI -4.59 to 0.73).

Table 1 shows a summary of the blood tests.

DISCUSSION

Pruritus is a common feature among women presenting with chronic vulval symptoms to various settings. Fischer *et al*⁶ reported itching as the predominant symptom in 66% of women with chronic vulval problems consulting a gynaecologist and 73% of women consulting a dermatologist. Thus, large numbers of women are probably screened for iron deficiency without robust evidence to support this practice.

Iron deficiency has been associated with chronic mucocutaneous candidiasis,⁷ but little evidence supports a link with vulvovaginal candidiasis.⁸ Davidson *et al*⁸ did not find any statistically significant difference in serum iron and serum ferritin levels between three groups of women: women with recurrent symptomatic vulvovaginal candidiasis; asymptomatic women with cultures negative for candida species; and asymptomatic women carrying candida. Crone *et al*⁹ found that 20% of patients with vulval dermatitis had iron

Table 1 Iron status and haematology results for participants and controls

	Participants			Controls			p Value (95% CI)
	Mean	SD	Range	Mean	SD	Range	
Serum iron (mmol/l)	16.4	8.2	2–42	20.4	10.7	3–51	0.06 (–8.1 to 0.1)
Serum ferritin (µg/l)	29.7	19.8	2–81	31.1	19.1	3–86	0.73 (–9.9 to 7.0)
TIBC (mmol/l)	63.7	8.7	51–83	65.8	7.9	48–84	0.24 (–5.7 to 1.5)
Transferrin saturation (%)	26	13.2	2–63	31	17.5	4–87	0.11 (–12.2 to 1.2)
Haemoglobin (g/dl)	13.1	1.2	8.9–15.7	13.5	1.1	9.0–15.4	0.17 (–0.8 to 0.2)
Mean cell volume (fl)	89.3	6.6	61.8–101.1	91.2	5.6	73.1–110	0.15 (–4.6 to 0.7)

TIBC, total iron-binding capacity.

deficiency, and Adams³ reported low ferritin levels in association with lichen simplex.

Although many authors have suggested an association between iron deficiency and pruritus, none have satisfactorily explained how this arises. Proposed mechanisms include epithelial abnormalities, neurological dysfunction and altered enzyme function.¹ The severity of itching has been linked to the degree of iron deficiency, and iron replacement has been reported to improve symptoms.^{1–3 7 9} However, no studies have examined the effect of iron replacement in women with pruritus vulvae of any cause.

Key messages

- No existing evidence supports iron deficiency as an aetiological factor in vulval pruritus of any cause.
- National guidelines suggest testing for serum ferritin only in women with vulval dermatitis, although it is common practice to test all women who present with vulval pruritus of any cause.
- This study does not support the practice of testing women with vulval pruritus of any cause for iron deficiency.

CONCLUSION

We found no substantial difference in serum iron status between women with pruritus vulvae of mixed aetiology and controls. Further studies should be undertaken to determine whether iron deficiency truly is an aetiological factor in specific conditions causing vulval pruritus and if so, whether

the effect of iron replacement would warrant further investigation.

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