High prevalence of iron deficiency in Swiss women of reproductive age

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Background

Iron deficiency (ID) and iron deficiency anemia (IDA) persist as a major global public health problem, also affecting industrialized countries such as Switzerland. However, national data on the prevalence of ID or anemia are lacking. Young women are one of the most vulnerable groups. The aim of this study was therefore to compile data on iron status from past studies conducted at the Human Nutrition Laboratory of the ETH Zürich and to assess the prevalence of ID and IDA in generally healthy young women in Switzerland.

Subjects/Methods

We have compiled data from 22 studies conducted between 2009 and 2019. This is a non-representative sample and most studies (n=21) included participants living in the area of Zurich, while one study was conducted at a national level (including 155 participants). In all participants, weight and height were measured using standard anthropometric techniques and a blood sample was taken for the determination of serum ferritin (SF), and hemoglobin (Hb) as markers of iron status and C-reactive protein (CRP), as a marker of inflammation.

Results

The sample included n=2606 women aged between 18 and 45 years (median age=23.4 years) with a mean BMI of 21.6 kg/m^2 (SD ±2.58). Mean Hb concentration was 13.6 g/dl ±0.98 and median SF concentration was 31.5 µg/l (range: 1.5-358.0). The prevalence of anemia, ID and IDA was 4.7 %, 19.1% and 3.4%, respectively. When correcting SF concentrations for inflammation using the BRINDA correction factor, the prevalence of iron deficiency remained unchanged at 19.8%.

Participant characteristics

	N	
Weight (kg)	2599	60.0 ± 7.88[1]
Height (m)	2599	1.67 ± 0.062
BMI (kg/m2)	2599	21.6 ± 2.58
Age (y)	2437	23.4 (17.9-63.0)[2]
Hb (g/dl)	2589	13.6 ± 0.98
Ferritin (ng/ml)	2606	32.7 (1.5-358.0)
CRP (mg/l)	2606	0.67 (0-62.6

[1] Mean ± SD (all such values); [2] Median (min-max) (all such values)

Prevalance

Biomarkers	% (N)
Ferritin < 15 ng/ml	19.1% (498)
Ferritin < 30 ng/ml	45.5% (1187)
Hb < 12 g/dl	4.7% (122)
Ferritin < 15 and Hb < 12	3.4 % (87)
CRP > 3 mg/l	16.5% (430)
CRP > 5 mg/l	9.3% (242)

[1]Iron deficiency: ferritin <15μg/L, low iron stores ferritin: <30μg/L, anemia: Hb<12.0 g/dl, inflammation: CRP>5 mg/L.

Conclusions

We found every fifth women to be iron deficient while the prevalence of anemia was below 5%. Thus, an important proportion of young Swiss women suffer from iron deficiency, potentially limiting their capacity to work and learn productively. The overall low prevalence of anemia suggests that preventive measures (low dose supplementation or dietary approaches) may be a low cost yet effective strategy to counteract iron deficiency in Swiss women.