Proceedings of the Nutrition Society (2024), **83 (OCE4)**, E341 doi:10.1017/S0029665124005792

Nutrition Society Congress 2024, 2–5 July 2024

Influence of adiposity on the prevalence of iron deficiency in women of reproductive age: data from the UK National Diet and Nutrition Survey 2008-2019 (NDNS)

S.P. Demirdjian[1], M.A. Kerr[1], M.S. Mulhern[1], P. Thompson[1], M. Ledwidge[2] and M.T. McCann[1]
[1]*Nutrition Innovation Centre for Food and Health (NICHE), Ulster University, Coleraine, United Kingdom*
[2]*School of Medicine, University College Dublin*

Overweight/obesity and iron deficiency are highly prevalent, particularly in women of reproductive age (WRA)[1]. Both can seriously affect women's health and cause severe complications in pregnancy[1]. Obesity is associated with nutritional deficiencies but its influence on iron deficiency is unclear. This study aimed to investigate the influence of adiposity on the prevalence of iron deficiency in UK women of reproductive age.

Data from NDNS (years 2008-2019) was used including general characteristics, anthropometry, iron biomarkers; haemoglobin (Hb), ferritin, and C-reactive protein (CRP) as a marker of inflammation. WRA aged 18-49 years with BMI ≥18.5kg/m^2 were included. Data were categorised as follows: Anaemia: Hb<120 g/L, Iron Deficiency Anaemia (IDA): Hb<120g/L and ferritin <30 μg/L, Iron Deficiency (ID): ferritin <30 μg/L, Iron Deficiency Without Anaemia (IDWA): Ferritin <30 μg/L and Hb>120 g/L[2]. Ferritin was adjusted for CRP (aFerritin)[3]. WRA were divided into two adiposity groups: BMI <25 kg/m^2 and ≥25 kg/m^2, waist circumference (WC) <80cm and ≥80cm, waist-toheight (WHtR) <0.50 and ≥0.50, and waist-to-hip ratio (WHR)<0.85 and ≥0.85 according to guidelines[4,5]. Weighting was applied to account for response differences between the surveys. Chi-square was performed to compare iron deficiency prevalence between adiposity groups and multiple logistic regressions adjusting for relevant covariates to evaluate the associations between adiposity and anaemia, IDA, ID and IDWA. P-value <0.05 considered significant.

n = 1098 WRA were included, n = 496 with normal weight and n = 602 with overweight/obesity (Ow/Ob). The overall anaemia, IDA, ID, and IDWA prevalence was 9.2%, 5.3%, 49.7%, and 42.9% respectively. Anaemia prevalence was greater in those with higher WHtR and WHR (11.9% vs 5.9% and 16.7% vs 6.5% respectively; both p<0.001). Greater IDA prevalence was observed in those with higher WC, WHtR and WHR (8.5% vs 4.3%, p = 0.005; 9.4% vs 3.3%, p<0.001; and 12.1% vs 4.9%, p<0.001). Overall prevalence of ID was 43% using unadjusted ferritin and 49.7% using aFerritin, both with similar prevalence observed between adiposity groups. IDWA prevalence was higher in the low WC compared to the high WC group (46.5% vs 40.1%, p = 0.030), however, no association was found between ID or IDWA with any adiposity group. Logistic regression analyses showed that higher WHtR and WHR predicted anaemia and IDA (anaemia: WHtR aOR 1.74 p = 0.045, WHR aOR 4.05 p<0.001; IDA: WHtR aOR 2.45 p = 0.011, WHR aOR 3.82 p<0.001).

ID prevalence in a representative sample of UK WRA is high, at 43%, with higher rates of 50% observed when ferritin is adjusted for inflammation, indicating the increased sensitivity of aFerritin in ID detection. A greater central adiposity in WRA is a risk factor for IDA. Public health strategies are needed to address the high prevalence of ID in UK WRA, particularly those living with Ow/Ob.

References

1. Cepeda-Lopez AC & Baye K (2020) *Public Health Nutr* **23**(10), 1703–4.
2. NICE (2023) Anaemia-Iron deficiency [available at: www.ckw.nice.org].
3. WHO (2020) Guideline on use of ferritin concentrations to assess iron status in individuals andpopulations [Available at: https://www.who.int/publications/i/item/9789240000124].
4. NICE (2023) Identifying and assessing overweight/obesity and central adiposity [Available at: https://www.nice.org.uk/guidance/cg189/chapter/Recommendations#identifying-and-assessingoverweight-obesity-and-central-adiposity].
5. WHO (2008) Waist circumference and waist-hip-ratio: report of a WHO expert consultation.