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Iron status of Māori, Pacific and other infants in Aotearoa New Zealand

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Abstract

Poor iron status is one of the most prevalent problems facing infants worldwide, in both developing and developed countries[1]. A complex interplay of both dietary and non-dietary factors affects iron intake, absorption, and requirements, and subsequently iron status[2]. We aimed to describe iron status in an ethnically diverse cohort of urban-dwelling infants. Data were collected from 364 infants aged 7.0 to 10.0 months living in two main urban centres in New Zealand (Auckland and Dunedin) between July 2020 and February 2022. Participants were grouped by total ethnicity, with any participants who did not identify as either Māori or Pacific categorised into a single 'others' group. Haemoglobin, plasma ferritin, soluble transferrin receptor (sTfR), C-Reactive protein, and alpha-1-acid-glycoprotein were obtained from a non-fasting venous blood sample. Inflammation was adjusted for using the Biomarkers Reflecting Inflammation and Nutritional Determinants of Anaemia (BRINDA) method[3]. Body iron concentration (mg/kg body weight) was calculated using the ratio of sTfR and ferritin. A total of 96.3% of Pacific infants were iron sufficient, defined as body iron ≥0 mg/kg body weight and haemoglobin (Hb) ≥105 g/L, compared to 82.3% of Māori and 76.0% of 'other' (i.e. neither Māori nor Pacific) infants. 'Other' infants had the highest prevalence of iron deficiency overall, with 2.8% categorised with iron-deficiency anaemia (IDA) (body iron <0 mg/kg, haemoglobin <105 g/L), 11.8% with early 'functional' iron deficiency (body iron <0 mg/kg, haemoglobin ≥105 g/L), and 9.4% with iron depletion (ferritin <15 µg/L, in the absence of early 'functional' iron deficiency and iron deficiency anaemia). For Māori infants, 3.2% and 6.5% had IDA and early 'functional' iron deficiency respectively, and 8.1% were iron depleted. One (3.7%) Pacific infant was iron depleted, and the remainder were iron sufficient. Plasma ferritin and body iron concentration were, on average, higher in Pacific compared to non-Pacific infants. These findings give an up-to-date and robust understanding of the iron status of infants by ethnicity, highlighting an unexpected finding that infants who are neither Māori nor Pacific may be at higher risk of poor iron status in NZ.

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