Proceedings of the Nutrition Society (2015), **74 (OCE1)**, E25 doi:10.1017/S0029665115000403

Summer Meeting, 14–17 July 2014, Carbohydrates in health: friends or foes

Iodine intake and excretion are low in British breastfeeding mothers

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Increasing evidence suggests that the UK population is iodine insufficient[1,2]. Iodine is essential for the infant's brain development during pregnancy and lactation and iodine deficiency is the most preventable cause of brain damage worldwide. This study aimed to assess the iodine status of breastfeeding mothers in the area of Glasgow, UK.

Recruitment for the survey took place in Greater Glasgow, UK, during June–July 2013 and February-March 2014. Dietary habits were recorded using a validated iodine-specific food frequency questionnaire[3]. Urinary iodine concentration (UIC) was measured using the Sandell-Kolthof colorimetric method on casual spot samples, and corrected for creatinine excretion.

A total of 168 breastfeeding mothers were recruited during summer 2013 ($n = 103$) and winter 2014 ($n = 65$). Mean age was 34 years (SD 4). They were mainly non-smokers (98%) with a normal BMI of 22·7 (IQR 20·7–25·7). There was no vegan, and only 1·8% reported using iodised salt. Median age of the babies was 26 weeks (IQR 15–35).

The median population UIC was 79 μg/l (IQR 43–120), lower than the WHO recommended threshold for lactation (100 μg/l), indicating mild iodine insufficiency. Although 63% of the participants consumed supplements, less than half (45%) contained iodine. Average iodine intake was 150 μg/day (IQR 105–196), 169 μg/day (IQR115–196) including supplements. Only 19% and 11% of mothers reached the intake threshold (≥250 μg/day) with and without supplements, respectively. Women who consumed iodised supplements were more likely to have sufficient iodine intake ($p = 0·002$) but there was no difference in UIC ($p = 0·6$) or UIC corrected for creatinine excretion ($p = 0·8$) between those consuming supplements or not. Similarly, no difference was seen between summer and winter samples or mothers with younger and older babies (>6 months) for UIC, dietary or total iodine intake. UIC corrected with creatinine was higher in the winter sample ($p < 0·001$).

	All ($n = 168$)		Summer Sample ($n = 103$)		Winter Sample ($n = 65$)		
	% dietary iodine intake						P *value*[*]
Milk	38		36		43		0·104
Dairy products	34		37		29		0·002[*]
Fish and Seafood	15		18		13		0·049[*]
	Median	*IQR*	*Median*	*IQR*	*Median*	*IQR*	
Dietary intake (μg/day)	150	105–196	150	100–197	150	105–189	0·813
Total intake (μg/day)	169	115–196	173	130–219	165	105–223	0·640
UIC (μg/l)	79	43–120	72	41–113	92	43–144	0·057
UIC (μg/g creatinine)	146	77–250	92	62–187	215	156–446	0·000[*]

Mann-Whitney U test, *$p < 0·05$, statistically significant difference between summer and winter samples.

Milk was the main source of dietary iodine, contributing toward 38% of the dietary iodine intake, with higher consumption in those with sufficient total iodine intake ($p < 0·001$).

While older and well educated, this sample still did not achieve the recommended iodine intake, and the population UIC was below the threshold for sufficiency. The use of supplements may be able to improve the iodine status of lactating women.

1. Vanderpump MP, Lazarus JH, Smyth PP *et al.* (2011) *Lancet* **377**, 2007–2012.
2. Bath SC & Rayman MP (2013) *P Nutr Soc* **72**, 226–235.
3. Combet E & Lean ME (2014) *J Hum Nutr Diet* doi:10.1111/jhn.12219 [ahead of print].