Myanmar Health Sciences Research Journal, Vol. 30, No. 1, 2018

SHORT REPORT

Iodine Deficiency in Pregnant Women Living in the Coastal Area of Mon State

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Key words: Iodine deficiency, Pregnant women, Coastal area

Iodine requirements sharply increase during pregnancy because of the transfer of iodine and thyroid hormone to the fetus, an increased needs for maternal thyroid hormone and maternal renal iodine clearance.[1] Thus, recommended iodine intakes during pregnancy are 250 μg/day compared with 150 μg/day for non-pregnant women and the corresponding median urinary iodine concentration (UI) indicating optimal iodine nutrition increases from 100-199 μg/l in non-pregnant women to 150-250 μg/l during pregnancy.[2]

Adequate iodine nutrition in pregnant women residing in coastal area where solar salt is available, is crucially important to prevent miscarriages, still birth, low birth weight babies as well as inevitable cretinism. In Mon State, there are coastal fishing and related industries such as production of dried fish, fish sauce and solar salt (unfortified salt).

Measurements of urinary iodine levels are often used for assessment of iodine deficiency disorders in populations because of accessibility of urine samples in community-based survey. Therefore, urinary iodine concentration can be used as an indicator for sufficiency of iodine nutrition status of pregnant women living in certain pocket areas like Panga Village and Kalokepi Village in Thanbyuzayat Township, Mon State.

A cross-sectional, descriptive study was carried out among the 144 pregnant women living in above mentioned villages. All pregnant women who were in generally good health, without visible goitre enlargement or other thyroid disorders or history of iodine supplements were included in the study. In the pilot survey, pie sorting was conducted to identify commonly consumed food among pregnant women. Based on these findings, food frequency questionnaires for consumption pattern of iodine rich food were constructed. The studied pregnant women were interviewed by using the structured questionnaires including background, parity, consumption patterns of salts and frequency of iodine rich food. Three each of iodized salt and non-iodized salt samples from local markets were collected for determination of iodine content by the iodometric titration method.[3] Casual urine samples were collected for urinary iodine determination based on Sandell-Kolthoff reaction[4] indicating changes in colour due to the presence of iodine.

In this study, 16.7% of study population used non-iodized salt for consumption. Majority of pregnant women (74.3%) did not consume seaweed (wet or dried) although they are rich in iodine content. Among sea foods, marine fish was the most common food which was consumed by 36.1% of study women. Mean iodine content of iodized salt and non-iodized salt were 20.6±9.2 ppm and 5.1±1.2 ppm, respectively.

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Although iodine concentration in salt at the point of production should be within the range of 20-40 ppm,[5] the lower limit could be considered these conditions such as salt with poor quality, long termed exposure to moisture, light, heat and contaminants. Proper packing, transport and storage should be carried out to maintain the desirable iodine content in salt as it may loss up to 50%.

It was found that the median urinary iodine concentration was 105 µg/l (5 to 295 µg/l). Out of 144 pregnant women, 65(45.1%), 41(28.5%) and 38(26.4%) pregnant women had urinary iodine level with less than 100 µg/l, 100-149 µg/l and 150 µg/l and above, respectively. It showed insufficient iodine nutrition in pregnant women.

Table 1. Urinary iodine concentration of pregnant women by types of salt consumed

Types of salt consumed	Urinary iodine concentration			p value
	Median (µg/l)	<150 µg/l* No.(%)	>=150 µg/l No.(%)	
Iodized salt	105.5	86(71.7)	34(28.3)	0.336
Non-iodized salt	102.5	20(83.3)	4(16.7)	

* 150 µg/l was used as cut-off point because during pregnancy, median urine iodine concentration between 150-249 µg/l defines a population which has no iodine deficiency.[2]

Table 1 shows the urinary iodine concentrations in pregnant women who consumed iodized salt and non-iodized salt were not significantly different where 150 µg/l was used as a cut-off. Only 16.7% of pregnant women consumed non-iodized salt and 19.4% used it for making dried fish.

Majorities of food producers were not willing to use iodized salt in processing due to the appearance of unfavourable colours in their products. Majority of pregnant women (74.3%) did not consume seaweed (wet or dried) although they are rich in iodine content. Therefore, the contributing factors for insufficiency of iodine nutrition in these pregnant women were low iodine content in iodized salt, inadequate consumption of iodine rich food and easily availability of non-iodized salt in the villages. Iodine contents of sea water fish and prawn were three to seven times higher than those of fresh water fish.[6] The sources of iodine from food are iodized salt and sea food in Myanmar.

Therefore, adequate consumption of seafood which are abundant in these areas, should be encouraged during pregnancy. Health education should be given to pregnant women to take iodine rich food and iodized salt for attaining sufficient iodine nutrition which is essential for growth and development of baby and themselves. Iodized salt should be used in production of dried fish and fish sauce. Universal salt iodization should be covered up to small scale factories especially in coastal area where solar salt are abundant.

Sustainable monitoring of iodine content in salt at retailed shops/ household levels, quality control procedures of salt iodization and urinary iodine concentration among pregnant women should be enhanced. Furthermore, information on standard operating procedures of salt iodization and the role of iodine in health should be disseminated to iodized salt manufacturers.

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