

Nutritional assessment among postnatal mothers availing health services at a maternity hospital in rural Karnataka

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ABSTRACT

Background: The postnatal period is a time of heightened nutritional needs. The recommended dietary allowance(RDA) of energy, protein, micro-nutrients like iron, calcium, vitamins, zinc and folic acid are enhanced during this period. This helps to satisfy the demands of lactation and protects the infant from nutrient deficiencies. **Objectives:** To assess the nutritional intake and its associated factors among postnatal mothers availing health care services at a rural maternity hospital in Ramnagara district, Karnataka. **Methods:** This cross sectional study was conducted among 159 postnatal mothers over a two-month period (July-August 2014). Written informed consent was obtained and a face-validated, semi-structured interview schedule administered. The socio-demographic data, obstetric history, detailed dietary history with a 24-hour dietary recall was obtained. Nutrient composition of the food item consumed was calculated using standard food conversion tables using an excel software developed for both raw and cooked foods. **Results:** Around 104 women were in the early postnatal period (within 1 week) and 55 were late postnatal (4-6 weeks). Majority were aged 18-25 years (81.1%), educated up to std 10 (44%) and belonged to Class II by modified BG Prasad's scale (34.6%). Majority had a normal vaginal delivery (79.2%) with child weighing >2500 gms (84.9%). Most women consumed inadequate calories (98.1%), proteins (94.9%), iron (49.7%) and calcium(65%). There was a significant association between the post-natal period and nutrient intake (p<0.05). **Conclusions:** Nutritional assessment and advice should form a key component during the postnatal visits to promote healthy eating and combat adverse immediate and long-term consequences.

Key Words: cross-sectional study, lactating women, nutrient intake, postnatal mothers, recommended dietary allowance .

INTRODUCTION

The post-natal period is crucial for both the mother and infant as additional maternal nutritional needs are to be met to ensure adequate breast milk production both in terms of quality and quantity by the infant. Healthy eating following childbirth plays a vital role in reducing the risk for many diseases⁽ⁱ⁾.

Although some women may consume a healthy diet during their pregnancy⁽ⁱⁱ⁾ these habits are slowly discontinued and often forgotten following childbirth^(ii,iii). This is particularly worrisome as increased intake of certain nutrients or the use of certain supplements is recommended in a lactating mother to satisfy the demands of milk production and to protect the infant from nutrient deficiencies^(iv).

The recommended additional dietary allowance of energy during lactation period in India in the first 6 months is 600 kcal and 23 grams of protein/kg per day (RDA 2010).

The need for micro nutrients like iron, calcium, vitamin A, B, C, zinc and folic acid are also enhanced during lactation^(v). Consequences of under nutrition during lactation include poor immune status, maternal and infant morbidities, low milk production, poor cognitive development in child^(vi). Low milk production could result in cessation of breastfeeding and introduction of cow's milk or formula with bottle feeds. This has short-term consequences for the infant like diarrhoea, pneumonia, otitis media and growth faltering as well as long-term consequences for the mother (ovarian and breast cancer, diabetes and metabolic syndrome)^(vii). Considering that promotion and maintenance of lactation has a major role to play in child survival, the onus lies on the primary care provider to offer education, assessment and advice not only concerning the health of the new-born and mother, but also regarding maternal nutrition intake in the postpartum period.

Assessing nutrient intake of lactating women therefore is essential to examine whether women in developing countries like India consume adequate levels to maintain both their health and their child's health. While providing maternal health services at a rural maternity hospital in a village in Ramnagara district of South Karnataka, it was observed that many lactating mothers complained of less milk or poor milk flow and their diet seemed inadequate to meet their needs during this crucial period. This study was therefore conducted to assess nutritional intake and its associated factors among rural lactating mothers in order to identify gaps in nutrition and suggest corrective dietary measures.

MATERIAL AND METHOD

This was a cross-sectional study conducted at a rural maternity hospital in a village in Ramnagara District in southern Karnataka. All post-natal mothers who availed of obstetric and child health services over a two-month period (July-August 2014) were consecutively sampled and invited to participate in the study. Written informed consent was obtained from each subject following which the women were administered a face-validated, semi-structured interview schedule in the local language. This obtained the socio-demographic data, obstetric history and detailed dietary history including a 24-hour dietary recall. Data was collected by medical interns who were trained in administering the 24-hour dietary recall. Standard portion size models and additional probing during the interview were used to assist in obtaining the recall. Nutrient composition of the food item consumed was calculated using standard food conversion tables using an excel software developed for both raw and cooked foods^(viii-x).

Women were categorised based on the post natal period as early postnatal (within 7 days of birth) and late postnatal (4-6 weeks post-delivery).

Statistical analysis: Descriptive data was reported as mean, standard deviation and percentages. Associations between intake of various nutrients and demographic/obstetric factors was done using Mann Whitney U test. A p value of <0.05 was considered statistically significant.

RESULT

A total of 159 postnatal mothers were included, 104 of whom were in the early postnatal period (within 7 days of birth) and 55 of whom were in the late postnatal period (4-6 weeks post-delivery).

Most of the women were aged 18-25 years (81.1%), were educated to std 10 (44%) and belonged to Class II by modified BG Prasad scale (34.6%). (see table 1). Majority had given birth to a child weighing 2500 gms or more (84.9%), and had a normal vaginal delivery (79.2%) (see table 1)

Table I: Socio-demographic details and obstetric characteristics of the post-natal women (n=159).

Variable	Category	N (%)	
Age	<18 years	4 (2.5)	
	Mean = 22.6+ 2.9 years	18-25 years	129 (81.1)
		> 25 years	26 (16.4)
Education	Illiterate	1 (0.6)	
Status	<10th standard	31 (19.5)	
	10th pass	70 (44)	
	PUC	33 (20.8)	
	Degree	24 (15.1)	
Husband's Education	Illiterate	8 (5)	
	<10th standard	40 (25.2)	
Socio-economic class	10th pass	50 (31.4)	
	PUC	24 (15.1)	
	Degree	37 (23.2)	
	Class I	38 (23.9)	
	Class II	55 (34.6)	
	Class III	45 (28.3)	
Mode of delivery	Class IV	15 (9.4)	
	Class V	6 (3.8)	
	Normal vaginal delivery	126 (79.2)	
delivery	Caesarean section	19 (11.9)	
	Assisted delivery	14 (8.8)	
Birth weight	< 2500 grams	24 (15.1)	
	≥ 2500 grams	135 (84.9)	
	Urinary tract infection	11(6.9)	
Antenatal complications	Pregnancy induced hypertension	10(6.3)	
	Anaemia	17(10.7)	
	Post-partum haemorrhage	4(2.5)	
Postnatal complications	Fever	6(3.8)	
	Abdominal pain	8(5)	
	Wound infection	1(0.6)	

Dietary intake

Around 147 (92.5%) women consumed a mixed diet. The staple food was rice for 77 (48.4%) of the women and ragi for 48 (30.2%), while the rest consumed both rice and ragi regularly. Almost 112 (70.4%) of the women consumed around 1 litre of water or less per day and the rest consumed 2 or more litres of water per day.

While 73 (46%) of the post-natal women consumed eggs at least once a week, only 11.3% and 12.6% consumed chicken and other meats at least once a week. The large majority of the women never consumed other sources of animal protein such as chicken (88.7%), fish (96.9%) and other meats (86.8%). Fruit consumption was also low among the mothers. Only 77 (48.4%) of the women consumed fruits on a daily basis.

Table II: Consumption of micro-nutrients and macro-nutrients by the post-natal women (n=159).

Nutrient	RDA for lactating women (sedentary)	Adequate Consumption (%)	Inadequate consumption (%)
Energy	2500KCal/day	3 (1.9%)	156 (98.1%)
Proteins	74gm/day	8 (5.03%)	151 (94.9%)
Iron	21mg/day	80 (50.3%)	79 (49.7%)
After supplementation with 100mg of elemental iron		126 (79.2%)	33 (20.7%)
Calcium	1000mg/day	55 (34.6%)	104 (65.4%)
After supplementation with 500 mg of calcium		84 (52.8%)	75 (47.2%)
Zinc	12mg/day	3 (1.9%)	156 (98.1%)
Folic acid	300ug/day	76 (47.8%)	83 (52.2%)
After supplementation with 500ug of folic acid		140 (88.1%)	19 (11.9%)
Vitamin A	950ug/day	6 (3.8%)	153 (96.2%)

Table III: Association between post natal period and daily nutrient consumption (n=159).

Nutrient intake	Early period postnatal	Late postnatal period	p value
	Median(IQR)	Median(IQR)	
Energy	1578.6(1392.4-1784.1)	1825.3(1547-2092.3)	0.001*
Protein	47.01(41.7-54.6)	51.9(45.7-59.7)	0.009*
Iron	16.5(11.5-80.1)	76.3(13.9-138.7)	0.002*
Calcium	596.4(247-1099.9)	1022(596.4-1694.1)	<0.001*
Zinc	6.2(5-7.4)	7.5(6.1-8.8)	<0.001*
Folic acid	272.7(215.7-380)	384.4(263.6-442.8)	0.003*

Mann Whitney U test),*-p<0.05

Nearly all the women (98.1%) consumed calcium, iron and folic acid supplements in the early postnatal period. However, this proportion was very small at 6 weeks or later (16.4%)(see table 2).

Majority of the post-natal mothers consumed a diet which was deficient in the required calories (98.1%) and proteins (94.9%). Almost half of the women consumed a diet deficient in iron while 65% were consuming a diet

deficient in calcium. This reduced to 20.7% following supplementation with 100 mg iron and 47.2% following supplementation with 500mg calcium.

DISCUSSION

The recommended dietary intake (RDA) for most nutrients are increased during lactation. This increase is to cover for exclusive breastfeeding for the first six months. In this study, the overall diet intake during the post natal period was found to be inadequate. The energy and protein consumption was found to be grossly deficient among the women. This in turn will have an effect on the quantity and quality of breast milk and thereby on the nutritional status of the infant.

Only half of the women in our study met recommended intakes for fruit. The reason for the low consumption could be due to the cultural practices followed in Indian households wherein many fruits and vegetables are thought to be ‘cold’ foods and hence avoided in the postnatal period. Few studies that have been done previously to assess dietary intake in mothers, have similarly shown diet quality to be sub-optimal for women during the postpartum period^(ii,xi). Meat and fish as well as legumes and green leafy vegetables are the main dietary sources of iron. In this study almost all women were taking iron supplements (98.1%) early post-partum which progressively dropped to 16.4% at the end of 6 weeks post-partum. Findings of another study done to estimate the prevalence of post-partum iron deficiency anaemia show that 42% of women in the immediate postpartum period were taking regular iron supplements^(xii). While the National Family Health Survey report (NFHS 4) states that close to half of all pregnant women are anaemic (50.3%), no such data is available in the post-partum period. Unlike in pregnancy, post-partum women are less likely to develop anaemia due to the replenishment of the previously depleted iron stores and the relative period of amenorrhea minimizing iron loss through menstruation. However, several studies show that iron levels remain low among women who are not supplemented with iron post-partum and therefore are at an increased risk of developing anaemia^(xiii,xiv). Half of the women in the present study fell short of their RDA of iron, and after supplementation with 100 mg elemental iron, the iron intake still fell short for 20.7% women.

Calcium is an important mineral required for the growth and development of a newborn’s bones and teeth. According to the National guidelines for calcium supplementation during pregnancy and lactation all women should be supplemented with at least 1000mg of Calcium/day^(xv). It was therefore not surprising that in this study almost half of the women still fell short of the recommended intake of calcium despite supplementation with 500 mg of calcium.

Also, there was a significant association between the post-natal period and nutrient intake. The consumption of

almost all nutrients both macro and micro improved 6 weeks following childbirth as compared to immediate post-partum except iron intake. This might be due to the role of prevalent cultural beliefs during the immediate postpartum period placing certain food restrictions and taboos on the woman. There was a decline in the iron intake with time partly because of discontinuation of iron supplementation following childbirth. This in turn puts a woman at greater risk for postpartum anaemia.

In the months following childbirth, there is a shift in focus from the mother onto the newborn hence advice regarding adequate post-natal diet and exercise is seldom provided. While there might be several unique barriers that a new mother faces which includes lack of time, child care difficulty, early return to work and so on, optimum focus and supportive strategies should be developed to promote healthy eating in the post-natal period as well.

Recommendations: The postpartum period is a time when self-care can be affected and consequently, nourishment too. The results of this study shows a worryingly low nutritional intake among rural postnatal women, both in terms of macro and micro-nutrients.

The lactation period provides an excellent opportunity to provide food and nutrition education, because mothers are receptive to advice during this time and because of greater health seeking behaviour for the child. Strategies should focus on addressing prevalent food taboos and ensuring provision of adequate nutritional supplementation in the postpartum period. Furthermore, future studies are necessary to explore the relationship between socio-cultural practices and dietary habits among these women.

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