



DIETARY ASSESSMENT OF PREGNANT SICKLERS

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ABSTRACT

“Sickle Cell Anemia” is one of the most troublesome and fatal disease. It is prevalent in many parts of India, where the prevalence has ranged from 9.4 to 22.2% in endemic areas. It is prevalently high in the rural region of Eastern Maharashtra. Women with sickle cell anemia, especially those who are pregnant, often experience sickle cell crises due to the extra stress of pregnancy. Since, the most important determinants of a baby’s health and proper growth is the mother’s diet, there arises a need for her proper nutrition during pregnancy, as her nutritional status may bound to affect the development of her baby. Hence, in the present research paper, an earnest attempt has been made to investigate & study the plight of pregnant women suffering with sickle cell anemia in the region of the Chandrapur district, Maharashtra, thereby keeping in mind the parameters pertaining to food habits, dietary intake, nutrient intake & the actual intake of nutrients as compared to RDA. The key findings reveal that the actual intake of nutrients on the part of these patients is much less as compared to their recommended values.

Keywords: Sickle cell anemia, dietary & nutrient intake, recommended dietary allowances.

INTRODUCTION

“Sickle Cell Anemia” is one of the most troublesome and fatal disease. It is prevalent in many parts of India, where the prevalence has ranged from 9.4 to 22.2% in endemic areas. Patients are widely scattered in the states of Assam, Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Karnataka, TamilNadu, Andhra Pradesh & Kerala. High prevalence

is observed in the rural region from the Eastern part of Maharashtra and hence population is at high risk in this area. The said region is flooded with general practitioners who have very little knowledge about this disease. Women with sickle cell anemia, especially those who are pregnant, often experience sickle cell crises due to the extra stress of pregnancy. Pregnant women with sickle cell are almost



anemic at the first pre-natal visit. Since, the most important determinants of a baby's health and proper growth is the mother's diet, there arises a need for her proper nutrition during pregnancy, as her nutritional status may bound to affect the development of her baby. In this crucial period of time it becomes all the more necessary for the expectant mother to take care of herself and so there arises a need for her to consume healthy nutrition so as to combat the pregnancy period.

On the basis of all the available information and literature the research scholar learnt that along with other parts of Maharashtra, sickle cell anemia is more prevalent in the Chandrapur district, too. Hence, an earnest attempt has been made on her part to investigate & study the plight of pregnant women suffering with sickle cell anemia in the region of the Chandrapur district thereby keeping in mind the following objectives; those are being highlighted in the present research paper.

Objectives

- To study the food habits of pregnant sicklers
- To assess the dietary intake of pregnant sicklers by 24 hours recall method
- To compute the nutrient intake of pregnant sicklers
- To compare the actual mean intake of nutrients with RDA.

METHODOLOGY

In the present study, careful collection of facts was undertaken by the researcher to ensure the validity of the facts. The study region being Chandrapur District in the Nagpur Division of the Indian state of Maharashtra, occupying an area of 11,443 km² which constitutes 3.72 percent of the total area of the state. In order to fulfill the objectives of this research work, sickle cell anemia affected pregnant women were selected from the study region i.e. Chandrapur district.

In order to study the food habits, dietary intake, nutrient intake in SCD affected pregnant women, standard methods were



employed to generate data. A randomized sample size of 250 was considered as an appropriate sample size for the present study.

The SCD screening process involved collection of blood samples. General information was collected using structured interview schedule and the specific information included information pertaining to food habits, meal pattern, dietary intake, nutrient intake. The information regarding diet was collected by 24 hours recall. Daily intake of food was recorded. Daily intake of nutrients was calculated by using Food value tables. Average daily intake of nutrients was compared with standards.

RESULTS

Nutrition is one of the most important elements of our lives. It has a profound impact on our health status, as well as many other factors. Diet is multidimensional and is influenced by biological, psychological, social and cultural factors.

The findings of this investigation are presented hereunder.

From the Table 1, it is evident that 73.6% (184) pregnant women take non-vegetarian diet, whereas 26.4% (66) pregnant women take only vegetarian diet. It is apparent from the data that significantly ($P < 0.05$) high percentage of sickle cell Anemia affected pregnant women in the study area take both vegetarian as well as non-vegetarian diet.

It is observed from the table 2 that 64.8% (162) pregnant women take morning breakfast, lunch and dinner, whereas for 18.4% (46) of them, prefer lunch, afternoon snacks and dinner, moreover, 12% (30) of the sickle cell anemia affected pregnant women, prefer morning breakfast, lunch, afternoon snacks and dinner and lastly, 4.8% (12) of them like to have lunch and dinner. It is evident that significantly ($P < 0.05$) high percentage of pregnant women followed morning breakfast, lunch and dinner daily diet schedule.



From Table 3 it may be seen that the average daily energy intake of the Sickle Cell Anemia affected women is about 1518 ± 203 . Thus, it is evident from the data that the daily energy intake of Sickle Cell Anemia affected pregnant women residing in the study region is significantly ($P < 0.05$) less than the standard recommended value for daily energy intake (2250 KCal). The average daily energy intake of Sickle Cell Anemia affected pregnant women was significantly less.

From the data reflected from the table 3, it may be seen that the average daily protein intake of Sickle Cell Anemia affected pregnant women is 39.61 ± 7.8 g/d. Thus, it is apparent from the data that the daily protein intake of Sickle Cell Anemia affected pregnant women residing in the study region is significantly ($P < 0.05$) less than the standard recommended value for daily protein intake.

Table 3 also depicts information pertaining to the

average daily fat intake of Sickle Cell Anemia affected pregnant women. Intake of fat was found to be 24.1 ± 2.6 g/d. Intake of fat is significantly ($P < 0.05$) less than the standard value for daily fat intake (30g/d). Hence, it may be concluded from the study results that the average daily fat intake of Sickle Cell Anemia affected pregnant women in study from their diet is notably low.

From the table 4, it is seen that daily iron intake of iron in the diet consumed by the subjects is 25.5 ± 6.0 mg/d. It is evident that the daily iron intake is significantly ($P < 0.05$) less than the standard recommended value for daily iron intake (35mg/d). Hence it may be concluded the average daily iron intake of Sickle Cell Anemia affected pregnant women in their diet is notably low.

It was observed that the average daily calcium intake of Sickle Cell Anemia affected pregnant women was 368 ± 157 mg/d which was significantly ($P < 0.05$) less than the



standard recommended value for daily calcium intake (1200mg/d).

From Table 5 it is seen that daily intake of carotene in the diet consumed by the subjects is 907 $\mu\text{g}/\text{d}$. It is obvious from the study result that daily carotene intake of pregnant sicklers is significantly ($P<0.05$) less than the standard value for daily carotene intake (6400 $\mu\text{g}/\text{d}$). The above table depicts that daily intake of B₁ Thiamine in the diet consumed by the subjects is 0.951 mg/d. It is apparent from the study result that their daily B₁ Thiamine intake is significantly ($P<0.05$) less than the RDA for daily Thiamine intake (1.2 mg/d). Hence it may be concluded the average daily B₁ Thiamine intake of Sickle Cell Anemia affected pregnant women in their diet is notably low.

It is seen from the table 5 that daily intake of Riboflavin in the diet consumed by the subjects is 0.986 mg/d. The table also depicts that daily intake of vitamin C in the diet consumed by the subjects is 73,2 \pm 34.6 mg/d. It is evident that the daily Vitamin C

intake is significantly ($P<0.05$) more than the standard recommended value for daily Vitamin C intake (60mg/d). The average daily Vitamin C intake of Sickle Cell Anemia affected pregnant women in their diet was sufficient.

Similarly, it is seen that daily intake of Folic Acid in the diet is 204 \pm 59 $\mu\text{g}/\text{d}$. Daily Folic Acid intake was significantly ($P<0.05$) less than the RDA.

According to Reed J D et al (1987), the role of protein and calorie deficiency in sickle cell disease remains poorly defined. While such features as growth retardation, impaired immune function, etc. do suggest a relationship between sickle cell disease and under-nutrition, measurement of more direct nutritional parameters in these patients have yielded mixed results. Also, iron deficiency is now known to be a relatively common occurrence in sickle cell anemia, especially in children and pregnant women. Mohanty and Mukherjee (2008), in their study have found



out that iron deficiency anemia was more common in sickle cell anemia patients as compared to sickle cell trait and normal controls and that was due to low dietary intake. Same trend was observed in present study. Dietary iron intake was low when compared with RDA.

Pellegrini et al (1995) evaluated the nutritional status of patients with sickle cell disease (SS) and concluded that patients with sickle cell disease showed indexes of malnutrition, Iron deficiency, hypercupremia and low plasma zinc levels related to low stature. According to Khalifa Al Mulhim (1999), Pregnancy in sickle cell disease (SCD) patients is

associated with increased risk to both mother and fetus. It is becoming clearer that recommended dietary allowances (RDAs) for the general population are insufficient for the sickle cell patient.

CONCLUSION

From the results & findings of the study pertaining to dietary intake, nutrient intake being taken on the part of the SCA pregnant women in the limited region of the Chandrapur district, Maharashtra, is less than RDA except Vitamin C. Overall the nutritional status of pregnant women suffering from sickle cell anaemia was found poor.

Table 1:Type of diet taken by sickle cell anemia affected pregnant women

Type of diet taken	No. of women	Percent
Vegetarian	66	26.4
Non-vegetarian	184	73.6
Total	250	100.0

**Table 2: Daily meal pattern of the sickle cell anemia affected women:**

Schedule of diet taken daily	No. of women	Percent	Cumulative Percent
Breakfast, Lunch, Dinner	162	64.8	64.8
Lunch, Snacks, Dinner	46	18.4	83.2
Breakfast, Lunch, Snacks, Dinner	30	12.0	95.2
Lunch and Dinner	12	4.8	100.0
Total	250	100.0	

Table 3:- Mean Intake of Energy and macronutrients of Sickle Cell Anemia affected pregnant women

Nutrient	Mean Intake	±SD	RDA	MD	Min.	Max.	't'	P
Energy kcal	1518	±203	2250	-732	1230	1823	78.230	<0.01
Protein g/day	39.61	±7.8	82.5	-42.59	36.52	58.7	-49.813	<0.01
Fats g/day	24.1	±2.6	30	-5.9	22.2	28.1	30.190	<0.01
Carbohydrates g/day	187	±46	495.3*	11.7	162	289	3.454	<0.01

SD: Standard Deviation; **RDA:** Recommended Daily Allowance; **MD:** Mean Difference; **Min:** Minimum; **Max:** Maximum; **t':** t' value ; **P:** Probability;

- By difference

Table 4 Daily intake of iron, calcium of the pregnant Sickle Cell Anemia affected women

Nutrients	Mean (mg/d)	±SD	RDA (mg/d)	MD	Min.	Max.	't'	P
Iron	25.5	±6.0	35	-9.5	21.3	28.2	-21.609	<0.01
Calcium	368	±157	1200	-832.2	302	867	-37.878	<0.01

SD: Standard Deviation; **RDA:** Recommended Daily Allowance; **MD:** Mean Difference; **Min:** Minimum; **Max:** Maximum; **t':** t' value ; **P:** Probability;

**Table 5:- Daily Intake of Vitamins By Pregnant Sickle Cell Anemia Affected Women**

Nutrients	Mean (mg/d)	±SD	RDA (mg/d)	MD	Min.	Max.	't'	P
Carotene(ug/d)	907	±169	6400ug/d	-5492	771	1569	-43.934	<0.01
B ₁ Thiamine	0.951	±0.017	1.2	-0.249	0.562	1.117	3.010	<0.01
B ₂ Riboflavin	0.986	±0.022	1.4	-0.414	0.637	1.335	3.078	<0.01
Vitamin C	73.2	±34.6	60	13.2	52.1	86.4	1.326	NS
Folic acid	204	±59	500	-296.5	184	258	-68.733	<0.01

SD: Standard Deviation; **RDA:** Recommended Daily Allowance; **MD:** Mean Difference; **Min:** Minimum; **Max:** Maximum; **'t':** 't' value; **P:** Probability

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