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Original Research Article

To Determine the Effect of a Combination of Nutritional Education and Nutritional Supplementation on Changes in the Nutritional Status of Newly Wed to Prevent Stunting in Newborns

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Abstract

Aim: The purpose of this study was to determine the effect of a combination of nutritional education and nutritional supplementation on changes in the nutritional status of the newly wed female to prevent stunting in newborns.

Methods: The present study was conducted at PMCH, Patna, Bihar, India for one year and the number of subjects from the three intervention groups was 120 people. The intervention group is group 1: nutrition education intervention (stunting material) + multi micronutrient, group 2: nutrition education (stunting material) IFA (iron folic acid) and group 3: nutrition education (reproductive health material) + IFA.

Results: The average age in group 1,2 and 3 was 24.19±2.60, 24.33±2.74 and 23, 48±2.53. The average BMI value of the three groups on the subject, before the interventions were 21.64±3.16 kg/m2. The mean BMI after intervention was 22.08±3.12 kg/m2 with a difference change of 0.45±0.36 kg/m2. There was a difference in the mean BMI before and after the intervention in all groups ($p<0.05$), meaning that there was a significant difference in the mean before and after the intervention. The statistical test showed that there was a significant difference in the mean BMI between the three groups ($p<0.05$). The provision of education and nutritional supplementation from marriage to delivery, based on the distribution of outcome variables, showed that of 120 newborns, 14 babies had a body length of <48 cm, namely stunting. And 15 had low birth weight (<2,500 grams). For the variable head circumference, 13 infants had abnormal head circumferences, i.e. <32 cm for male infants and <31 cm for female infants.

Conclusion: The intervention can change the parameters of the nutritional status of the subject and there is a relationship between weight gain during pregnancy and infant anthropometry.

Keywords: Education, Nutrition Supplementation, Nutritional Status, Stunting.

Introduction

Stunting is a condition of failure to thrive in children under five years of age due to chronic malnutrition. [1] Stunting has an impact on the level of intelligence, reduces productivity, vulnerability to disease, thus hampering economic growth and increasing poverty and inequality which has long-term effects, for himself, his family, and the government (Ministry of Finance, 2018).

Short Toddler or called stunting is where the nutritional status is based on an index of body length or height that does not match where in anthropometric standards, the assessment of the nutritional status of children, the results of these measurements are at the threshold (Z-Score) <-2 SD to -3 SD (short/stunted) and <-3 SD (very short/severely stunted). Stunting is a chronic malnutrition problem caused by inadequate nutritional intake for a long time due to feeding that is not in accordance with nutritional needs. Stunting can occur from the first 1000 days of life (HPK) children can cause growth disorders that are difficult to fix when they are adults, such as cognitive which can affect learning performance in school. [2]

Mothers who have poor nutritional status, suffer from complications during pregnancy are a predisposing factor for the low health of babies born. [3] Efforts to create a quality generation through healthy families, by preparing starting from marriage are expected to have good health status, especially for female who will later become pregnant and give birth. The fertile period in women is the most important period so that the need for nutritional intake before pregnancy must be balanced in order to achieve optimal nutritional and health status to prepare for a healthy pregnancy. [4] Women of childbearing age (WUS) are vulnerable to the problem of lack of macro and micro nutrients so that they experience nutritional problems. [5] Pre-pregnancy Body Mass Index (BMI) is the most influential factor on birth weight. [6] WUS who experience chronic energy deficiency (KEK) during pre-pregnancy and pregnancy will have low body weight so that they are at risk of giving birth to stunting babies. [7]

Women of childbearing age (WUS) who experience chronic energy deficiency (KEK) during pre-pregnancy and pregnancies who have low body weight will be at risk of giving birth to stunting babies. Efforts to reduce the risk of CED and anemia in the pre-pregnancy period are very important to reduce the risk of malnutrition in the next generation. [8] Body weight before pregnancy (preconception period) should not be more or less than 10 percent of normal body weight according to height (BB/TB), in fact many women of childbearing age have unbalanced nutritional intake. An imbalance that lasts for a long time can cause nutritional problems in WUS. [9] Mothers with short stature (<145 cm) and low body weight before pregnancy had a higher risk of giving birth to babies with low birth weight than mothers with normal height. [10]

The purpose of this study was to determine the effect of a combination of nutritional education and nutritional supplementation on changes in the nutritional status of newly wed to prevent stunting in newborns.

Materials and Methods

The present study was conducted at PMCH, Patna, Bihar, India for one year and the number of subjects from the three intervention groups was 120 people. The intervention group is group 1: nutrition education intervention (stunting material) +multi micronutrien, group 2: nutrition education (stunting material) IFA (iron folic acid) and group 3: nutrition education (reproductive health material) +IFA.

Inclusion and exclusion criteria

The inclusion criteria in this study inclusion criteria as follows: Just married planning for pregnancy.

Subject exclusion criteria are: pregnant, suffer from severe anemia (Hb level <8 g/dl), smoke, suffer from chronic disease, abnormal menstrual cycle and do a diet program.

Data collection

The characteristics of the subject (age, education, occupation, income), health status includes data on Hb levels, nutritional intake. Nutritional status of subjects by measuring anthropometry (body weight, body high and MUAC). Compliance with nutritional supplement consumption with a dose of 1 tablet per week from catin until before pregnancy and during pregnancy a dose of 1 tablet daily during pregnancy until before pregnancy. give birth to. Anthropometry of newborns (body weight, body length and head circumference).

Statistical analysis

Data were analyzed using Microsoft Excel 2016 and SPSS (V.16) programs. The analysis was performed using the mean (SD) and number (percentage).

Results

Table 1: Nutritional status of subjects before and after intervention

Nutritional status variable Intervention	Groups			P value
	Group I N=40	Group II N=40	Group III N=40	
BMI Newly married				
Before	22.28±2.70	21.67±3.11	20.97±3.54	0.030
After	22.72±2.75	22.30±3.06	21.31±3.44	0.000
Δ	0.44±0.40	0.34±0.29	0.34±0.37	0.010
P Value	0.00	0.00	0.00	
Weight gain for pregnant women				
Before	52.47±6.13	52.79±6.36	49.46±8.41	0.027
After	65.34±4.99	64.27±5.68	59.46±8.25	0.000
Δ	12.86±2.45	11.48±2.53	10.00±2.65	0.000
P Value	0.00	0.00	0.00	

The average age in group 1,2 and 3 was 24.19±2.60, 24.33±2.74 and 23, 48±2.53. The average BMI value of the three groups on the subject, before the interventions were 21.64±3.16 kg/m2. The mean BMI after intervention was 22.08±3.12 kg/m2 with a difference change of 0.45±0.36 kg/m2. The results of the Wilcoxon test showed that there was a difference in the mean BMI before and after the intervention in all groups ($p<0.05$), meaning that there was a significant difference in the mean before and after the intervention. The statistical test showed that there was a significant difference in the mean BMI between the three groups ($p<0.05$). The difference test between groups (ANOVA) showed that there was a significant difference in the mean increase in gestational weight gain in the three groups ($p=0.000$).

Table 2: Effect of intervention on newborn anthropometric variables

Antropometric newborn variable	Groups Mean±SD			P value
	Group I N=40	Group II N=40	GroupIII N=40	
Body Length	49.41±1.29	49.32±1.50	48.67±1.22	0.02
Stunting <48 cm	1	5	8	
Stunting >48 cm	39	35	32	
Body weight	3013.83±299.79	2916.10±312.56	2823.03±294.06	0.04
LBW <2500 gram	1	5	9	
Normal>2500 gram	39	35	31	
Head circumference	33.11±1.72	33.01±1.86	32.32±1.08	0.06
Abnormal (P<31 cm; L<32 cm)	1	5	7	
Normal (P≥31; L≥32 cm)	39	35	33	

The provision of education and nutritional supplementation based on the distribution of outcome variables, showed that of 120 newborns, 14 babies had a body length of <48 cm, namely stunting. And 15 had low birth weight (<2,500 grams). For the variable head circumference, 13 infants had abnormal head circumferences, i.e. <32 cm for male infants and <31 cm for female infants. The distribution of the number of cases at risk of stunting was highest in group 3 and the lowest cases in the group that received intervention in group 1. The average body length of the babies in the three groups was 49.21±1.36 cm. The results showed that there was a significant difference in the mean body length of infants between groups (p=0.02). For the variable mean baby weight in the three groups that is equal to 2920.921±309.7 grams.

Discussion

Nutritional problems are a problem experienced by every country, be it developed countries, developing countries, or poor countries. Nutritional problems that often receive attention from the state are underweing, stunting, wasting, and micronutrient deficiency. Stunting is caused by multimedia factors and not only caused by poor nutrition experienced by pregnant women and children under five. The most decisive intervention to reduce the prevalence of stunting, therefore it needs to be carried out on 1000 days of HPK from children under five. Some of the factors that cause stunting can be described from the lack of knowledge of mothers regarding health and nutrition before and during pregnancy and after the mother gives birth. Another factor is the case of still limited health services for children and mothers during pregnancy. [2]

Maternal nutritional needs during pregnancy have increased for optimal health of the mother and fetus in the womb, if the intake is less then they will suffer from nutritional deficiencies both macro and micro. [11-15]

The provision of micronutrient supplementation in the preconception period is more important than only given during pregnancy. Intervention during pregnancy will miss the critical preconception period. Giving multi micro nutrients 2-6 months before pregnancy overcomes the problem of low quality of pregnancy outcomes (spontaneous abortion, prematurity and LBW. [14] The results of statistical tests showed that there was a significant difference in the mean weight gain of pregnancy in the three groups (p=0.000). And there is an effect of weight gain of pregnant women (nutritional status) on pregnancy outcomes.

The nutritional status of the mother during pregnancy is a determining factor for the growth and development of the fetus in the womb. [16] Malnourished women contribute to the trans-generational cycle of malnutrition. The MMS supplementation intervention gave a larger mean change when compared to IFA. [17] This shows that the MMS intervention is more effective than the IFA supplementation intervention than Fe alone, combining Fe with Folic Acid or Fe with Vitamin C helps to improve the anthropometric quality of newborns, so it is recommended that supplementation should be given early in pregnancy or even before pregnancy in order to reserve nutrients in the newborn. the body is able to meet the increased needs before and during pregnancy. [18] Babies born with low birth weight and height <48 cm (risk of stunting) represent impaired growth in the fetus or fetal period. [12]

Lack of various types of micronutrients causes problems in pregnancy and affects pregnancy outcomes. [13] Meeting the adequacy of micronutrients during the preconception period can contribute to improving the baby's birth length. The mean length of the babies born from the group given the MM supplement was significantly higher than the birth weight of the babies given the control/IFA supplementation group (p=0.001). [19] Various research has proven the superiority of MMS in overcoming pregnancy problems and low outcomes when compared to IFA. [20,21]

Conclusion

Providing educational interventions and effective nutritional supplementation can change the parameters of the nutritional status of the subject and affect the length of the baby's body and weight of the newborn ($p<0.05$) and there is a relationship between weight gain during pregnancy and the length of the baby's body, baby's weight and head circumference ($p<0.005$).

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