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Impact of nutrition counselling on food adequacy of expectant hypertensive and diabetic patient

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Nutrition intervention is considered the cornerstone of treatment for all women with pregnancy complications. Educating pregnant women on proper consumption of nutrients and a healthier lifestyle will help promote a healthy pregnancy. The objectives of this study is to assess the impact of nutrition counselling on food adequacy of pregnancy induced hypertension (PIH) and gestational diabetes mellitus (GDM) patients and a 24 hour recall questionnaire was used to assess the food intake among patients. Twenty two PIH and GDM patients were selected and equally divided into two groups, *i.e.*, experimental group and control group. Nutrition counseling was imparted for three months (experimental group) at 30 days interval. The mean daily intake in the experimental group for pulses had no significant change, while cereals, milk and milk products, meat, fish and poultry, fruits, green leafy vegetables and other vegetables was increased significantly and that of roots and tubers, fats and oils and sugar and jaggery decreased significantly. However, the control group had no significant change for pulses, cereals, milk and milk products, meat, fish and poultry, fruits, green leafy vegetables, other vegetables, roots and tubers and sugar and jaggery while a significant decrease was observed in the mean daily intake of fats and oils.

Key Words : Nutrition counseling, Pregnancy induced hypertension, Gestational diabetes mellitus, Daily food intake

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INTRODUCTION

Adequate nutrition is of paramount importance during all the stages of a life as life cannot be sustained without adequate nourishment. To lead a healthy and productive life human being require a wide range of nutrients which are dependent upon age, sex, physical activity and physiological status. Expectant mothers require increased amount of body building and protective nutrients. Inadequate nourishment coupled with pregnancy induced complications may ultimately make the vulnerable stage of life more risky. This period is marked by high accumulation of nutrients in the form of maternal and foetal tissue growth. Nutrition during pregnancy is of great importance because the foetus draws it nutrients from the mother. It is uncared for and the maternal nutrition is inadequate, the body reserves are drawn up and depleted. Thus child bearing imposes great strain and increases considerably the nutritional requirement of the mother (Grewal, 2007).

Good health and nutrition before conception are key to a mother's ability to meet the nutrient demands of pregnancy and breastfeeding, and are vital to the healthy

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development of her embryo, foetus, infant and child (Hanson *et al.*, 2015). A girl's or woman's nutritional health and lifestyle before and during pregnancy can influence clinically important pregnancy outcomes, including gestational hypertension and diabetes, preterm delivery and foetal growth restriction which can have lasting effects on her long-term health (Morton, 2006 and Scholl, 2008).

Nadkarni *et al.* (2001) defined pregnancy induced hypertension (PIH) or hypertension during pregnancy as a systolic blood pressure of 140 mm Hg or higher or a diastolic blood pressure of 90 mm Hg or higher, occurs after 20 weeks gestation in previously normotensive women. Hypertensive disorders predispose the women to serious complications, including thrombocytopenia, disseminated intravascular coagulation, acute renal failure, hepatic failure, pulmonary oedema, adult respiratory distress syndrome and cerebral haemorrhage (Dutta, 2004). Waller (2006) estimated the frequency of hypertensive disorders of pregnancy to be between 7-10 per cent. Kalra *et al.* (2013), on the other hand, defined gestational diabetes (or gestational diabetes mellitus, GDM) as any degree of glucose intolerance with the onset or first recognition during pregnancy with or without remission after the end of pregnancy. It also known as hyperglycemia and is defined by Sreelakshmi *et al.* (2015) as a condition characterized by carbohydrate intolerance of variable severity that particularly develops during pregnancy. During the third trimester of pregnancy, the mother experiences an impaired ability to metabolize carbohydrates properly. This factor is usually caused by a deficiency of insulin production, which does occur during the third trimester of pregnancy. Prasanna and Jyothi (2016) believed that the hormones produced during pregnancy reduce a women's response to insulin, leading to high blood sugar levels. Women who are diagnosed with GDM typically have normal carbohydrate tolerance before pregnancy and their carbohydrate tolerance returns to normal after delivery as opposed to diabetes mellitus Type 1 and Type 2. GDM is a severe and neglected threat to maternal and child health. International diabetes federation in 2013 estimates that 6 million births are affected by some form of hyperglycaemia in pregnancy in India alone, of which 90 per cent are due to GDM.

Power of diet has a long legacy beginning with the Greeks and Romans. It is said that every therapy that has no faith in the efficiency of medicine, has conceded the importance of food for a happy life. Keshinro and Ijarotimi (2008) found that calcium supplementation reduces the incidence of high blood pressure in pregnant women at high risk of pregnancy induced hypertension as well as pregnant women with low dietary calcium intake. Diaz *et al.* (2002) suggested that sodium, folic acid and zinc were significantly correlated with systolic blood pressure during gestational hypertension. Lauszus *et al.* (2001) on the other hand, examined the effect of a diet high in mono-unsaturated fatty acids, on blood pressure, blood glucose control, lipids and insulin sensitivity in women with GDM and authors found that although the diet had a favourable impact on blood pressure, no improvement in insulin sensitivity resulted. Moses *et al.* (2009), trialled a low glycemic index (GI) diet (consisting of foods that are slowly digested and which release energy slowly) for its effect on reducing insulin requirements and found that adherence to the diet successfully reduced the number of women requiring insulin.

Nutrition intervention is considered the cornerstone of treatment for all women with pregnancy complications (Fagen *et al.*, 1995). Nutrition counseling significantly increases the knowledge, attitude and practice as well as improves the nutritional status of patients suffering from the gestational diabetes mellitus (Kaur and Singh, 1998). In the area of nutritional assistance, dietary counseling may be understood as discussed and negotiated guidelines of food and nutrition which aim the making of autonomous decisions related to behaviour and food practices. Thus, it is important to educate and help treat the current disorder to help ensure a healthy, normal pregnancy and delivery. Educating pregnant women on proper consumption of nutrients and a healthier lifestyle will help promote a healthy pregnancy for both the mother and her baby (Troumbly, 2003). Due to dearth of information on dietary management practices of pregnancy induced complications in Assam, the present study on impact of nutrition counselling on nutritional status of expectant hypertensive and diabetic patient" was undertaken.

A total representative sample of 22 numbers within the age range of 20-39 years were selected for the investigation and were equally divided into two group *viz.*, experimental and control group. A schedule was developed for conducting the 24 hour recall method to record the individual food consumption.

Visual and audio-visual aids were constructed and

selected to be combined with lecture method for imparting nutrition counselling to the respondents. Visuals selected were folders, leaflet, projected slides, booklets, bookmarks and calendar of the year used to make them aware about the judicious choice of different foods which are better to be included in the dietaries and the other foods which are to be avoided for complications in pregnancy like hypertension and diabetes mellitus. The aids were prepared keeping in mind the content of the message to be conveyed to the target population.

The daily food intake of the target population was recorded and anaysed to assess the total food intake in comparison to the standard balanced diet recommended. Nutrition counselling was imparted to the experimental group, while the control group was not given any counselling. Dietary intake of both the groups were recorded twice *i.e.* before and after nutrition counselling. The difference between mean existing daily food intake of the respondents and mean post exposure daily food intake of the respondents has been termed as "gain in food adequacy". The data were then put to statistical analysis.

OBSERVATIONS AND ASSESSMENT

The adequacy of food intake of the respondents before and after nutrition counseling is presented in Table 1.

The adequacy of cereal consumption per day increased significantly after nutrition counseling from 238.32 to 288.46 g in the experimental group with 11.54 per cent deficit of BDR and a non-significant increase was found in the control group, *i.e.*, from 261.26 to 276.71 g with 23.29 per cent deficit of BDR.

The pulse adequacy per day of the respondents in the experimental group increased non significantly after nutrition counseling from 30.01 to 30.09 with 0.09 per cent excess of BDR while in the control group also a non-significant change was seen where the daily pulse intake increased from 27.28 to 33.50 after 3 months with 3.50 per cent excess of BDR.

The adequacy of daily intake of milk and milk products increased significantly from 149.76 to 199.09 g in the experimental group with 300.91 per cent deficit of BDR after nutrition counseling. In the control group, milk and milk products intake of the respondents per day increase non-significantly by from 158.85 to 159.70 g after 3 months with 340.30 per cent deficit of BDR.

When compared with the intake of meat, fish and poultry per day of the respondents before and after nutrition counselling, it was found that, it increased significantly in the experimental group from 38.32 to 50.21 g with 0.21 per cent excess of BDR after nutrition counseling. While in the control group, a non-significant increase was observed from 58.74 to 64.07 g per day with 14.07 per cent excess of BDR.

In case of daily consumption of fruits by the respondents, it can be revealed that, the average daily intake of fruits in the experimental group increased significantly from 78.18 to 155.90 g after nutrition counseling with 44.10 per cent deficit of BDR and in the control group a non-significant increase was observed

Table 1: Adequacy of food intake of the respondents before and after nutrition counselling

Food stuff (g)	Experimental group (n = 11)					Control group (n = 11)				
	Before	After	S.E.±	C.D. (P=0.05)	% Excess or deficit of BDR	Before	After	S.E.±	C.D. (P=0.05)	% Excess or deficit of BDR
Cereals	238.32	288.46*	12.94	26.99	- 11.54	261.26	276.71**	-	-	- 23.29
Pulses	30.01	30.09**	-	-	+ 00.09	27.28	33.50**	-	-	+ 03.50
Milk and milk products	149.76	199.09*	20.85	43.49	- 300.91	158.85	159.70**	-	-	- 340.30
Meat, fish, poultry	38.32	50.21*	03.42	07.14	+ 00.21	58.74	64.07**	-	-	+14.07
Fruits	78.18	155.90*	26.71	55.72	- 44.10	67.27	75.45**	-	-	- 124.55
Green leafy vegetables	81.23	165.87*	16.01	33.40	+ 15.87	84.80	85.22**	-	-	- 64.78
Other vegetables	52.72	104.99*	12.94	27.00	+ 04.99	54.54	65.36**	-	-	- 34.64
Roots and tubers	30.72	13.87*	08.98	18.74	- 86.13	33.12	22.59**	-	-	- 77.41
Fats and oils	34.79	15.00*	02.64	05.50	- 10.00	35.69	21.06*	03.34	06.97	- 03.94
Sugar and jaggery	08.36	01.63*	02.13	04.44	- 18.37	07.90	06.81**	-	-	- 13.19

* and ** indicate significance of values at P=0.05 and 0.01, respectively NS = Non-significant

where the per day consumption of fruits by the respondents increased from 67.27 to 75.45 g with 124.55 per cent deficit of BDR.

It was observed from the study that the daily intake of green leafy vegetables in both the experimental and control group increased, yet the increase in the experimental group was significant while that of the control group was non-significant. The per day consumption of green leafy vegetables was increased significantly in the experimental group from 81.23 to 165.87 g after nutrition counseling with 15.87 per cent excess of BDR while in the control group the increase after 3 months was non-significant *i.e.* from 84.80 to 85.22 g with 64.78 per cent deficit of the BDR.

The consumption of other vegetables per day increased significantly from 52.72 to 104.99 g in the experimental group with 4.99 per cent excess of BDR after nutrition counselling while it had a non-significant increased from 54.54 to 65.36 g with 34.64 per cent deficit of BDR in the control group.

It is evident from Table 1 that the average daily intake of roots and tubers in the experimental group decreased significantly from 30.72 to 13.87 g with 86.13 per cent deficit of BDR while in the control group a non-significant decrease was seen from 33.12 to 22.59 g with 77.41 per cent deficit of BDR.

The consumption of fats and oils per day decreased significantly in both the experimental and control group from 34.79 to 15 g and 35.69 to 21.06 g, respectively with 10 and 3.94 per cent deficit of BDR in both the respective groups.

It can be inferred from Table 1 that the daily intake of sugar and jaggery decreased significantly in the experimental group from 8.36 to 1.63 g with 18.37 per cent deficit of BDR and in the control group, the decrease was non significant, *i.e.*, from 7.9 to 6.81 g with 13.19 per cent deficit of BDR.

It was observed that there were wide variations in the food adequacy of the respondents in the experimental group. This may be due to effective nutrition counseling provided to the experimental group for three months.

Conclusion:

The study indicated that the adequacy of consumption in terms of five food groups revealed that cereals, pulses, fats and oils and sugar and jaggery were consumed by all the respondents daily. The consumption of fruits, other vegetables and meat, fish and poultry was quite frequent in comparison to green leafy vegetables and milk and milk products.The average daily consumption of cereals, pulses, green leafy vegetables, other vegetables and meat, fish, poultry and egg by the target population was fulfilled upto 70-95 per cent of the balanced diet recommended. On the other hand the mean daily intake of milk and milk products, fats and oils and sugar and jaggery was less than 50 per cent of the BDR.The inadequate consumption of green leafy vegetables and milk and milk products is a matter of concern because poor consumption of these food groups leads to the deficiency of key vitamins and minerals which in turn may affect the overall growth and development of the pregnant mother and the developing foetus.The consumption of income elastic food such as milk and milk products, meat, fish and poultry and fats and oils increased with increase income of the families which indicated that as income improves, the choice of food is influenced resulting in a better intake of food and nutrients. A higher socio-economic status may guarantee better maternal nutrition and health care, which improve the pregnancy outcome. The present study revealed that the nutrition counselling imparted to the pregnant women with diabetes mellitus and hypertension was efficient in terms of gain in knowledge of the respondents.

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