Effect of Nutrition Counselling on the Anthropometry and Blood Pressure in Non-Insulin Dependent Female Diabetics

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KEYWORDS Body Mass Index. Blood Pressure. Nutrition Education. NIDDM

ABSTRACT The present study was conducted on sixty non-insulin dependent diabetic women in the age group of 40-60 years. After assessing the basic knowledge of the subjects about the disease by knowledge testing questionnaire all the subjects were imparted nutrition education regarding the disease, its symptoms, causes, complications and dietary modifications. The height, weight, mid upper arm circumference, tricep skinfold thickness body mass index and waist to hip ratio of the subjects was measured before and after nutritional education. A significant decrease in weight (66.45 to 61.20 kg), body mass index (27.70 to 25.56 kg/m²) and waist to hip ratio (0.88 to 0.85) was observed. The mean systolic (154.7 to 150 mm Hg) and diastolic (91.8 to 87.4 mm Hg) blood pressure decreased significantly (P ≤ 0.01) after intervention. Therefore it can be concluded that nutrition counselling is an important measure for improving the knowledge and bringing about favourable and significant changes in anthropometry of diabetics.

INTRODUCTION

Diabetes mellitus is an endocrinological disorder in which nutritional education (NE) plays an important role in the control of hyperglycemia and further help in the retardation of secondary complications. People who eat too much food and lead a sedentary life become overweight and obese. Obesity is a major risk factor for the development of diabetes as it reduces the sensitivity of tissues to the action of insulin and in the utilization of glucose. The risk of diabetes increase with greater body mass index (BMI) and even women with average body weight had an elevated risk (Colditz et al., 1995). Stuchldreucher et al. (1994) suggested that waist to hip ratio act as a marker of risk for diabetes complications mainly through an influence on other complications. Hypertension contributes significantly to morbidity and mortality in diabetic patients (Pati et al., 1996). Studies by various workers indicate that obesity and NIDDM is interlinked and NE can play an important role. So, the present study was planned to see the efficacy of nutrition counselling on the anthropometry and blood pressure of the diabetic subjects.

MATERIALS AND METHODS

Sixty non-insulin dependent female diabetic subjects in the age group of 40-60 yrs were selected from PAU, Hospital, Ludhiana. After assessing the basic knowledge of the selected diabetic subjects about the disease by knowledge testing questionnaire, the subjects were imparted NE after every 15 days during 3 months period. Education regarding diabetes, types of diabetes, the causes, symptoms, complications, dietary management was imparted to the patients. Visual aids like charts and posters were used. Summary of lectures on diabetes and dietary treatment, food exchange lists were given as handout to each subject.

The subjects knowledge regarding diet and diabetes was assessed using same knowledge testing questionnaire after 3 months education period and differences in knowledge score was calculated. Height, weight, mid upper arm circumference (MUAC), tricep skin fold thickness (TSFT), waist to hip ratio (WHR) was measured before and after NE by using standard methods given by Jelliffe (1966) and BMI was calculated by using formulae weight in kg/ht. in meter square. The blood pressure of the subjects was recorded with sphygmomanometer by physician by method given by Maclead (1984). The data obtained was analysed by using the appropriate statistical tools.

RESULTS AND DISCUSSION

The anthropometric parameters of the subjects before and after NE is presented in table 1. The mean height of the subjects was 154.90 cm. The mean weight of the subjects before NE
Table 1: Major anthropometric measurements of the subjects before and after nutrition education

<table>
<thead>
<tr>
<th>Variables</th>
<th>Before N.E.</th>
<th>After N.E.</th>
<th>t-value</th>
<th>Reference standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (cm)</td>
<td>154.90±0.61</td>
<td>154.90±0.61</td>
<td>-</td>
<td>NA</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>66.45±1.34</td>
<td>61.20±1.10</td>
<td>3.47**</td>
<td>50</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>27.70±0.52</td>
<td>25.60±0.48</td>
<td>2.23**</td>
<td>20-25</td>
</tr>
<tr>
<td>Midupper arm circumference (cm)</td>
<td>29.80±0.44</td>
<td>29.25±0.41</td>
<td>1.61**</td>
<td>28.5</td>
</tr>
<tr>
<td>Tricep skin fold thickness (mm)</td>
<td>25.11±0.74</td>
<td>25.02±0.74</td>
<td>0.07 NS</td>
<td>16.5</td>
</tr>
<tr>
<td>Waist hip ratio</td>
<td>0.88±0.009</td>
<td>0.85±0.01</td>
<td>2.56**</td>
<td>1.8</td>
</tr>
</tbody>
</table>

N.E. - Nutrition education, ** - Significant at 5%, * - Significant at 10%, NS - Non-significant NA - Data not available


was 66.45 kg which reduced significantly (P≤0.01) to 61.20 kg, after NE. The reduction in body weight can be due to reduction in energy intake. Reduction in body weight after dietary counselling was also reported by Anuradha and Vidhya (2001) and Dunstan et al. (2002).

A derived index of fatness from weight and height was used to classify the subjects into grades of obesity according to classification proposed by James et al. (1988). About 25% of the subjects were normal weight and 15% were severely overweight i.e. 2nd grade of obesity before NE. After NE, percentage of subjects in normal weight increased to 35% and decreased to 3% in severe over weight category. The mean BMI of the subjects before NE was 27.7 kg/m² which reduced to 25.5 kg/m² after NE. Mid upper arm circumference value of the subjects before and after NE was 29.8 and 29.25 cm, respectively. A non-significant decrease in MUAC was observed after NE. It was found that after NE there was non-significant decrease in skinfold thickness at triceps. In comparison with the standard (16.5 mm) laid down by Jelliffe (1966) the tricep skinfold thickness (TSFT) value was higher in the subjects. A significant (P<0.05) decrease in waist to hip ratio was observed which may be due to reduction in body weight. Chang et al. (1992) and Hodge et al. (1993) have reported that after NE of 3 months, WHR had significantly reduced (Table 2).

It was found that BMI was negatively correlated with weight (r=0.926), MUAC (r=0.625), TSFT (r=0.624), fasting glucose (r=0.292) and post prandial (r=0.282) glucose. The BMI and MUAC showed negative correlation with HDL-C (r=-0.258) and (r=-0.293), respectively.

Before NE, the mean systolic blood pressure of the subjects was 154.7 mm Hg and reduced significantly (P≤0.05) to 150 mm Hg, after NE. The mean diastolic blood pressure before and after NE was 91.8 and 87.4 mm Hg. Decrease in diastolic blood pressure after NE was found to be significant (P≤0.01)(Table 3). Reduction in systolic and diastolic blood pressure among NIDDM diabetics of coimbatore after dietary counselling was also reported by Suganthi and Saradha (1991).

Nutrition counselling improved the knowledge of subjects regarding the disease and thus improved their diabetic state. The mean score of diabetic knowledge improved significantly (P≤0.01) in post test (5.17 to 10.28) Results are in agreement with the results of Jeremy et al. (2003) who reported the positive impact of nutrition education (Table 4).

**CONCLUSION**

Hence from the foregoing results it can be inferred that people should be made aware about...
the disease through nutrition counseling as the present study shows that with the increase in knowledge scores the anthropometric parameters and blood pressure of the diabetics patients reduced significantly. Therefore it can be concluded that nutrition counseling is an important and effective measure for improving the knowledge and bringing about favorable and significant changes in anthropometry and blood pressure of diabetics which further leads to improvement in the diabetic state.

REFERENCES


Raghuram, T.C., Pasricha, S and Sharma, R.D.: *Diet and Diabetes*. National Institute of Nutrition. ICMR, Hyderabad


<table>
<thead>
<tr>
<th>Table 4: Distribution of percent knowledge scores obtained by the subjects before and after nutrition education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scores</td>
</tr>
<tr>
<td></td>
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<tr>
<td>&lt;8</td>
</tr>
<tr>
<td>9-17</td>
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<tr>
<td>18-25</td>
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<tr>
<td>Mean Pre-test scores ($T_1$)</td>
</tr>
<tr>
<td>Mean Post-test scores ($T_2$)</td>
</tr>
</tbody>
</table>

N.E. - Nutrition education, *** - Significant at 1%, $T_1$ - Pre - test, $T_2$ - Post - test