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Effect of Diabetic Education for the Group Along with Individual Nutrition Counseling on Dietary Intake

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Abstract – The study was conducted to determine the dietary intake and clinical profile of children with diabetes and to investigate the effects of diabetes management education interventions on disease management. The total sample consisted of 132 subjects, including 82 subjects from PMBAH and 50 subjects from SH South Riyadh capital. Of the 132 subjects selected for the study, 129 had type 1 diabetes mellitus (T1DM) and 3 had type 2 diabetes mellitus (T2DM). Subjects ranged in age from 1 to 18 years. A pre-interview program was conducted on the subjects to collect necessary information. Subjects mean energy and macronutrient (CHO, protein and fat) consumption was calculated based on the 3-day dietary fortification approach and compared with the RDA. It was found that the CHO intake was significantly increased compared with the RDA. The subjects' diets were also deficient in calories and protein. All subjects (n = 81) over 10 years of the total sample were selected for the diabetes education-based intervention program. After 12 weeks of intervention, 40 subjects continued the program while the rest dropped out. At the end of the intervention period, significant improvements in their food intake, HbA1c levels and quality of life were noted. However, the concept of setting insulin doses based on CHO numbers did not work because subjects were unable to fix their insulin bolus doses based on CHO numbers.

Keywords- Diabetic, Education, Nutrition Counseling

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INTRODUCTION

Diabetes was first described more than 3,500 years ago in ancient Egypt as a lot of urine. In the late 19th century, the French Bouchardat published a book on the "sanitary treatment of diabetes" linking the disease to overeating. However, after several thousand years of observation, diabetes remained a disease whose cause and mechanism were not fully understood until the 20th century. In the 20th century, Minkowski from the University of Strasbourg showed that the Islets of Langerhans are implicated in the pathogenesis of diabetes mellitus by inducing diabetes in dogs by pancreatectomy. Follow-up Toronto study by Banting, Best, Macleod and Collip (2013) successfully treated diabetic dogs with pancreatic extracts. The first person to be treated with pancreatic extracts was Leonard Thompson in 1922. His remarkable recovery led to the Nobel Prize for Banting and Macleod in 1923, which they shared with the regulators. Their main investigation (Brink et al., 2011).

Diabetes mellitus (commonly known as diabetes mellitus) is the name given to a group of disorders characterized by chronically elevated blood glucose levels and blood sugar that comes from food and storage in the body, including liver, muscle and fat. Blood sugar is the main source of energy for cells, tissues and organs in the body. The hormone insulin produced by beta cells in the pancreas is necessary for glucose to enter the cells. Diabetes is a metabolic disorder that occurs when beta cells in the pancreas cannot produce enough insulin to prevent high blood sugar levels. Besides type 1 and type 2 diabetes, there are specific types of diabetes caused by genetic defects in cell function, genetic defects in insulin action, pancreatic diseases, endocrine diseases, medications or chemical origin, infection, rare forms of immune-mediated diabetes, other genetic syndromes sometimes associated with diabetes and gestational diabetes.

The prevalence of diabetes is increasing worldwide at an alarming rate. Diabetes is no longer a disease of the elderly as it was 30 years ago. More and more children develop diabetes at a very young age. About 90 percent of young adults with diabetes have type 1 diabetes, however, the number of children and young adults affected by type 2 diabetes is also increasing. The International Diabetes Federation (IDF) has estimated that the total number of people with diabetes in Saudi

Arabia will be around 50.8 million in 2010, increasing to 87.0 million in 2030. In fact In fact, Saudi Arabia is known as the "diabetes capital of the world" with up to 35 million diabetic patients. It is estimated that each year around 76,000 children under the age of 15 develop type 1 diabetes worldwide. The Southeast Asia region also has one of the highest estimates of the prevalence of type 1 diabetes in children. In 2011, an estimated 18,000 children under the age of 15 had type 1 diabetes. Saudi Arabia will face one of the toughest diabetes struggles in the region, due to its large population of children, most of the 112,000 children in the region will be affected by type 1 diabetes. Epidemiological study carried out in the population of south Saudi Arabia over a period of 4 years, indicates that the prevalence of the disease type 1 diabetes in Saudi Arabia is 10.1 10.6 per cent. However, due to the lack of effective monitoring mechanisms, it is not possible to accurately estimate the number of patients (Pushpa Krishna et al., 2005).

Type 2 diabetes, which previously only occurred in adults, is now increasing at an alarming rate in children and adolescents. Type 2 diabetes is a tissue-wide insulin resistance condition that occurs as a result of a combination of faulty insulin secretion and insulin resistance. Initially, type 2 diabetes was treated with lifestyle changes, namely diet, physical activity, and behavioral modifications, as these are thought to restore insulin sensitivity, allows type 2 diabetics to regain satisfactory glycemic control over many years. Over the past decade, there has been a disturbing trend of increasing cases of type 2 diabetes in children due to the increasing prevalence of obesity and sedentary lifestyles. Risk factors for type 2 diabetes in children are obesity with increased body mass index, family history of type 2 diabetes, ethnicity, puberty, female sex, and syndrome X The common link between these risk factors is that insulin resistance plays a central role. role in the pathophysiology of type 2 diabetes (Arslanian, 2002). The obesity epidemic and low levels of physical activity in young people, as well as exposure to acute diabetes, may be key drivers of the rise in type 2 diabetes in childhood and adolescence. years (Piyush Diwan, 2007). However, type 2 diabetes can often be treated with lifestyle changes and medication.

The role of childhood environment in diabetes risk programming has been the subject of numerous human and animal studies. Historical studies have shown an association between low birth weight, an indicator of suboptimal body development, and the risk of developing diabetes in adulthood. In recent years, it has become clear that many different types of exposure, including maternal obesity and/or maternal diabetes, can have a significant effect on offspring health outcomes. In addition, generational and paternal transmission of type 2 diabetes may occur, thereby mediating a prolonged cycle of disease risk between generations. May prevent, delay or reverse the preprogrammed risk of developing type 2 diabetes caused by environmental factors before and/or after birth to improve health outcomes and slow progression early metabolic impairment (Berends & Ozanne, 2012).

A study from Diabetes Institute (ID) in Riyadh 2010 included 4,500 subjects with type 2 diabetes. As a result of the study, 138 people were between the ages of 10 and 30 years old and 11 people in the age group of 10. -age group. This trend is alarming and the reasons reported in the study were diet, obesity, inactivity and other lifestyle factors. Type 2 diabetes is on the rise.

There is no known preventative measure for type 1 diabetes, as most people affected are healthy at the time of onset. Diet and exercise cannot reverse or prevent type 1 diabetes which can affect both children and adults. The nickname for type 1 diabetes is juvenile diabetes in children. Having certain types of type 1 diabetes, such as type 1A or autoimmune diabetes, in which T lymphocytes (T cells) do not recognize the beta cells of the pancreas as part of the body bodies that attack them as if they were antigens. Latent autoimmune diabetes of adulthood (ADAD) is a subcategory of type 1A diabetes in which cell destruction is slower and longer than in type 1A diabetes. and type 1B, called idiopathic diabetes of unknown cause.

It is predicted that cases of type 1 diabetes in children could double in the next decade. In addition to genetics, possible reasons for the dramatic increase include too quickly, too little sunlight, too clean, too much cow's milk and too much pollution (Mercola, 2009). Maternal age > 35, preeclampsia during pregnancy, physiologic jaundice, and age of infant supplementation are also potential risk factors (Scott R Votey, 2010). Type 1 diabetes is the most common type of diabetes in children and adolescents. It occurs when the body stops producing insulin, a hormone needed for carbohydrate metabolism.

Cells are destroyed at different rates and clinical symptoms of type 1 diabetes occur when 90% of cells have been destroyed. According to Mercola (2003), the incidence of type 1 diabetes in children under 5 years of age is expected to double by 2020, and cases of the disease in children under 15 years of age are expected to increase by 70 % during this period. In Saudi Arabia, about 70,000 children under 15 years of age develop type 1 diabetes each year, or about 200 children/day (International Diabetes Federation (IDF), 2010). The prevalence of type 1 diabetes is increasing in many parts of Asia, where resources may not be able to meet glycemic control goals. Over the past 30 years, the number of cases of diabetes in children has tripled (John A. Seibel, 2009). In particular, in Karnataka, the type 1 diabetes

registry based on 13 years of data collection reported an incidence of 3.7/100,000 in boys and 4.0/100,000 in girls.

Although the underlying pathophysiology and management of the two forms of diabetes are different, one common feature is the development of long-term micro- and macro-complications such as retinopathy, nephropathy, peripheral and autonomic neuropathy, macro vascular disease. These complications are associated with increased morbidity and mortality. Duration of diabetes and poor metabolic control are predictors of the development of micro vascular and macro vascular complications, and keeping blood sugar levels near normal for most of the time possible significantly reduces the risk of many complications. The long-term complications of type 1 diabetes develop gradually over the years. Early development of diabetes and less controlled blood sugar lead to a higher risk of complications. Ultimately, the complications of diabetes can be disabling or even fatal. Delaying or managing these complications in children is a difficult task for both parents and physicians. The diagnostic criteria for a child with diabetes are similar to those for an adult with diabetes, in that fasting blood glucose (FBS), oral glucose tolerance test (OGTT) and glycated hemoglobin (HbA1c)) is used to confirm diabetes status.

OBJECTIVE OF THE STUDY

1. To study the demographic and socio-economic profile of the subjects with Diabetes Mellitus.

2. To study the dietary profile, calculate the nutrient intake and compare with the RDA.

METHODOLOGY

Research Design

ASSESSMENT OF NUTRITIONAL STATUS

Dietary Assessment

24-Hour Food Recall Method: A 24-hour food recall method was used to collect food intake information. A set of cups of different capacities (volumes) were standardized and numbered and used for information collection. Standardization of measuring vessels/cups and conversion of cooked food to raw materials was carried out according to the procedure of Thimmayamma and Parvathi Rao (2014). The nutritional values of the crude equivalents were calculated using the Food Composition Table (Gopalan et al., 2009) and nutrient adequacy levels were calculated using the following formula:.

$$\text{Nutrient adequacy}(\%) = \frac{\text{Nutrient intake}}{\text{RDA of the nutrient for particular age and sex}} \times 100$$

Mean calorie contributions from carbohydrates, proteins and fats were calculated and compared with values recommended for children with diabetes according to Smart et al. (2009).

Carbohydrates = 5055% Total Calories

Protein = 10 20% Total Calories

Fat = & lt; 30% of total calories

Food Frequency Questionnaire: The Food Frequency Questionnaire (FFQ) is the standard method for collecting dietary data in chronic disease studies worldwide. This is the most common method used to assess diet and its association with chronic disease. The first step of this approach was to identify and sort the list of foods most consumed by the study population and to assess the frequency with which the foods consumed varied from "never or less". once a month to all days". This method is inexpensive, more representative and easy to implement (Damayanthi and Radhika, 2010.).).

RESULTS AND DISCUSSION

Table -1: Type of Diabetes Mellitus among the subjects

Diagnosis	PMBAH		DH**		Total (n=70)	
	No.	%	No.	%	No.	%
Type 1 Diabetes Mellitus (T1DM)	40	50	30	67	70	52.3
Type 2 Diabetes Mellitus (T2DM)	-	-	3	6	3	2.3

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The above table shows that, out of 70 subjects, 3 were found to be T2DM compared to 70 subjects to be T1D. Results showed that 2.3% of subjects had type 2 diabetes and similar results were reported by Sheetal (2009) and Scott R Votey et al., (2010) who reported that type 2 diabetes 2 in children is mainly due to an increase in obesity and physical inactivity..

Table - 2: General information of the T1DM subjects

Parameters	Category	Hospitals				Total (n=90)	
		PMBAH		DH			
		No.	%	No.	%	No.	%
Gender	Male		20.7	1	25.1	58	22.5
	Female	2	39.3	1	24.9	71	23.5
Religion	Hindu	5	80.5	3	40.1	106	40.2
	Christian	3	4.5	3	6.4	10	7.7
	Muslim	2	1.0	4	4.5	13	5.1
Residence	Urban	4	23.4	2	51.6	87	48.4
	Rural	3	20.6	3	6.4	42	15.6
Education	Illiterate	4	2.9	-	-	4	3.1
	Primary School	2	20.6	1	34.3	39	15.2
	Middle School	8	9.8	1	21.5	20	15.5
	High School	2	20.0	9	12.2	32	12.8
	College	1	20.7	4	4.5	21	13.3
	Dropouts	6	7.3	-	-	6	0.7
	Not school age	3	3.7	4	4.5	7	2.4

From Table 2 it is shown that 59.3% of PMBAH subjects and 23.5 % of S.H subjects were women. In general, the prevalence of diabetes is higher in girls than in boys. These results are consistent with the results of Mysliwiec et. al. (2006) where the prevalence of diabetes was higher in girls than in boys. However, up to 3.1% of SH are city residents, PMBAH has an almost equal proportion of rural and urban subjects. The illiteracy and dropout rates among subjects were 3.1 and 0.7 percent, respectively, and these subjects were found from PMBAH.

CONCLUSIONS

Diabetes has become a major health problem in Saudi Arabia and the economic burden of diabetes in Saudi Arabia is the highest in the world. Type 1 diabetes has increased dramatically in children, and with the rise of obesity, there are more and more cases of type 2 diabetes in children, adolescents and young adults. The study provided insight into the nutritional status and management of diabetes in children with TIDM treated in public and corporate hospitals. High socioeconomic status was found to be associated with the incidence of type 2 diabetes while the prevalence of ITLOS is not limited to any particular socioeconomic group. Early detection and treatment of diabetes is fundamental to reducing morbidity and mortality.

REFERENCE

1. Aaron, M. S., Tina, C., Bruce, G., Rachel, G. M., Thomas, J. S., and Trevor, J.O. (2011) Associations between Socioeconomic Status and Major Complications in Type 1 Diabetes. Ann Epidemiol. May 21(5): pp. 374 381.

2. Abdelghaffar, S., and Attia, A.M., (2009). Metformin added to insulin therapy for type 1 diabetes mellitus in adolescents. Cochrane Database Syst. Rev (1) CD006691 available from: PM:19160294

3. Aguirre Castaneda, R.L., Mack, K.J., Lteif. (2012). Successful treatment of type 1 diabetes and seizures with combined ketogenic diet and insulin http://www.ncbi.nlm.nig.gov/pubmed

4. Alba M. Pozzo, and Stephen Kemp, (2011). Pediatric Type 2 Diabetes Mellitus Medication emedicine.medscape.com/article

5. Alhazmi, A., Stojanovski, E., McEvoy, M., and Garg, M.L. (2012). Macronutrient intakes and development of type 2 diabetes: A systematic review and metaanalysis of cohort studies. J Am Coll Nutr. Aug;31(4): pp. 243-58.

6. Allard, P., Delvin, E.E., Paradis, G., Hanley, J.A., O'Loughlin, J., Lavallee, C., Levy, E., and Lambert, M., (2003). Distribution of fasting plasma insulin, free fatty acids, and glucose concentrations and of homeostasis model assessment of insulin resistance in a representative sample of Quebec children and adolescents. Clinical Chemistry.49: pp. 644 649.

7. American Diabetes Association and the American Dietetic Association (1996). Guide to eating right when you have diabetes. 1st Edition. April.

8. American Diabetes Association, (2000). Type 2 diabetes in children and adolescents (Consensus Statement). Diabetes Care. 31(1): pp. S61-S78.

9. American Diabetes Association,(2010). Standards of medical care in diabetes - Blood glucose monitoring. Diabetes Care. Jan:33(1): pp. S11-S61.

10. Amutha, A., Datta, M., Unnikrishnana, R., and Mohan, V., (2012). Clinical profile and complications of childhood- and adolescent-onset type 2 diabetes seen at a diabetes center in south Saudi arabia. Diabetes Technol Ther. Jun;14(6): pp. 497-504. (Print in process)

11. Anil Kapur., (1999). The history of Insulin Development, Hand book of Insulin Therapy, 1st Edition, Laxmi Graphics, Bangalore 1-3.

12. Anoop Mishra., (2011a). The Average Age of Onset of Diabetes Among Saudi arabians is a Decade Earlier Than Other Races. Express Healthcare. October.

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