Food Intake in Relation to Nutritional Needs In Diabetic Patients in Surgical wards

Prepared by:

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B.Sc. Applied Medical Science King Soud University,1993

Master Environmental Sc., Ain Shams University, 2001

A Thesis Submitted for Partial Fulfillment

of

the Requirement for the Doctor of Philosophy

In

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2010

Dedicated to

My Grandfather

Consultant, councilor of Law Prof. Houssein El Sayed

Acknowledgment

My deepest appreciation to **Prof. Dr. Mahi El-Tehewy** Prof. of Public Health-Faculty of Medicine Ain Shams University for her wise advice and kind supervision; offering me much of her valuable time, continuous encouragement, and support.

I am so grateful to **Ass. Dr. Eman Kamal Abdelkader El-Gabry** Assistant Consultant of Nutrition National Institute of Nutrition, for her supervision, help, and support.

I am so appreciative to **Dr. Maha Mohamed El-Gaafary** Assistant Prof. of Public Health-Faculty of Medicine Ain Shams University, for her generous guidance, assistance, and supervision.

Special thanks to:

Prof. Dr. Mostafa Hassan Ragab Prof. and Head of Medical Dep. Institute of Environmental Studies and Research Ain Shams University.

Prof. Dr.Magdy Nazzeh Azmy Hindy Prof. and Head of Nutritional Education Dep. National Institute of Nutrition

My appreciation to all who helped in conveying this thesis.

Abstract

Introduction: The nutritional care of hospitalized patients is a multidisciplinary approach of all persons in the heath team. Accumulated evidences indicate the presence of a gap between dietitian and treating physician leading to incidence of nutritional hazards that may affect diabetics as a vulnerable group.

Aim: 1-To assess the basal energy expenditure during hospitalization on admission, post operatively and on discharge/ end of study. 2- To assess daily total energy and distribution of proteins, carbohydrate, and fat. 3-To to analyze the diet order and food intake and compare it with the actual nutritional needs 4- To develop written policy and procedures for clinical nutrition function in the hospital with special reference to the diabetic patient.

Methods: A cross sectional study was conducted on 400 diabetic patients admitted to the Medical Center of Arab Contractors for surgery. A complete nutritional assessment was done for each patient on admission, post operation, and on discharge. Activity factors, injury factors were estimated and caloric requirement was calculated using Harris-Benedict equation. Nutritional index was used to evaluate the adequacy of the caloric intake for each patient.

Results: 34.8, 27.5 & 31.8% of diabetic patients received adequate calories on admission, post operatively respectively and on discharge. Logistic regression analysis identified the following significant independent variables for inadequate caloric intake; males, young patients, patients with renal diseases, patients subjected to wrong diet order, patients with BMI > 30, patients with activity factor out of bed and patients with RBS below average. Post operatively independent variables for inadequate caloric intake were young patients and patients with wrong diet order.

Conclusion: considerable percentage of diabetic patients received inadequate calories on admission 261(65.25%), post operative 290(72.5%), and 243(60%) on discharge. Independent risk factors included individula patient characteristics as well as wrong diet order.

Recommendations: Diet order needs to be individualized and tailored to meet the nutritional needs of each patient.

List of Abbreviations

AAs	African Americans
ADA	American Diabetes Association
A-FABP	Adipocyte fatty acid-binding protein
AHA	American Heart Association
BEE	Basal Energy Expenditure
BIA	Bioelectrical Impedance Analysis
BMI	Body Mass Index
Bp	Blood Pressure
CAD	Coronary Artery Disease
CCE	Conventional carbohydrate exchange
CHO	Carbohydrates
DBp	Diastolic Blood Pressure
DM	Diabetes Mellitus
DPP	Diabetic Prevention Program
EA	European American
F	Female
FTO	Fat mass and obesity associated
GI	Glycemic index
HANES	Health and Nutrition Examination Survey
HbA1c	Glycosylated haemoglobin
HCHF	High Carbohydrate High Fiber
HDL	High-density lipoprotein
HF	High Fat
HOMA-IR	Homeostasis Model Assessment of Insulin Resistance
HP	High Protein
hsCRP	High-sensitive C-reactive protein
IDDM	Insulin Dependent Diabetes Mellitus
IGT	Impaired Glucose Tolerance
IL-18	Interleukin 18

INA	Instant Nutritional Assessment
Kcal	Kilo-Calorie's
Kg	Kilograms
LAGB	Laparoscopic Adjustable Gastric Banding
LCLF	Low Carbohydrate Low Fiber
LDL	Low-Density Lipoprotein
M	Male
MAMC	Mid Arm Muscle Circumference
MR	Moderate Risk
MUFA	Mono-Unsaturated Fatty Acids
n	Number
NHANES	National Health and Nutrition Examination Survey
NIDDM	Non Insulin Dependent Diabetes Mellitus
NI	Nutritional Index
NR	No Risk
NRI	Nutritional Risk Index
NST	Nutritional Support Team
OHG	Oral Hypoglycemic Drugs
REE	Required Energy Expenditure
SBp	Systolic Blood Pressure
SFA	Saturated Fat
SGA	Subjective Global Assessment
SR	Severe Risk
SSIs	Surgical Site Infection
sTNFR2	Soluble Tumor Necrosis Factor Receptor 2
TQM	Total Quality Management
TRL	Triglyceride-Rich Lipoproteins
USA	United States of America

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Introduction

Without an adequate supply of food, tissues break down- no body cell is immune against poor nutrition. Add to this the effects of illness. **(Marian, 1996)**

Nutrition is an input to and foundation for health and development. Interaction of infection and malnutrition is well-documented. Better nutrition means stronger immune systems, less illness and better health. Healthy children learn better. Healthy people are stronger, are more productive and more able to create opportunities to gradually break the cycles of both poverty and hunger in a sustainable way. Better nutrition is a prime entry point to ending poverty and a milestone to achieving better quality of life. **(WHO, 2009)**

This first large scale study of individual-based dietary intakes in the general population in Eastern Europe implies that intakes of saturated fat, sugar and complex carbohydrates are a cause for concern. The development of country-specific nutritional tools must be encouraged and nutritional campaigns must undergo continuing development. **(Boylan et al., 2010)**

In the simplest terms nutrition may be defined as the process by which the organism utilizes food. This process is a complicated one involving digestion, absorption, transport, storage, metabolism and elimination of the many nutrients that are to be found in the very varied diets which we call our food. All of this has its purpose the maintenance of life, growth, reproduction and normal functioning of organs and production of energy.

Nutriture, or nutritional status, is the state of the body produced by the process and is determined by the balance between the supply of nutrients on one hand and the expenditure nutrients done by the organism on the other hand. In relation to epidemiology the concept of an Agent-Host-Environment interaction system has been developed. It is helpful to extend this to nutrition. The agent of nutrition is clearly nutriment or the nutrient interaction with host; man in this case. That part of the Environment concerned in nutrition is the part of it we ingest, namely food**. (Donaled, 1981)**

Nutrition, is the relationship of food to the well - being of the human body. It includes:

1-The metabolism of food

2-The nutritive value of foods

3-The qualitative and quantitative requirements for food at different ages and developmental levels to meet physiological changes and activity needs.

4-Changes in nutrient and food requirements that accompany or prevent disease states.

5-The economic, psychological, social and cultural factors that affect the selection of diet & food habits.

The science and practice of nutrition exist and attempt to contribute to a more secure life, relatively free of disease.

The nutritional care process is the assessment of the: individual's nutritional status, the identification of nutritional needs or problems, the planning of objectives of nutritional care to meet these needs, the implementation of nutritional care to meet these needs, the implementation of nutritional activities, including education, necessary to meet the objectives, and the evaluation of the nutritional care.

Nursing and medicine have always been concerned with the feeding of the sick. From the time of the Egyptian medical era, a relation has been recognized between food and disease, and some form of diet therapy has been practiced. Celsus emphasized the role of food in preventive medicine about 25 B.C, when he wrote:" …we come to those which nourish, namely food and drink. In (1671) Nicolai Venette recognized the efficacy of using vegetables and fresh fruits as antiscorbutics. In the early (1870s), Dr. F. W. Pacy, of the royal College of Physicians, London, began a traits on food and dietetics. **(Krause and Mahan, 1984)**

The nutritional care of hospitalized patients is not the function of dietitian alone. It is a multidisciplinary approach using the knowledge, the empathy and interest of all persons in the "health team". Good nutritional care of inpatients may well shorten the length of hospitalization.

Nutrition is an integral part of the monitoring and care of diabetes. Compliance with a nutritional plan is, however, one of the most difficult goals to achieve due to the changes in lifestyle that it implies. In order to integrate nutrition effectively into the follow-up and control of diabetic patients, it is necessary to have a multidisciplinary team of professionals basically comprising a doctor specializing in Endocrinology and Nutrition, a dietitian and a trainer in diabetes issues**. (Canovas et al, 2001)**

If the diabetic patients condition has been kept under control, he may undergo needed surgery without any unusual risk. Food in liquid form is usually the first type of food

permitted orally. After minor surgery, the patient may be given his usual diet immediately. The diet advances in a procedure similar to that described for the non-diabetic. The blood glucose determinations govern the amount and type of insulin injections. Diets for control of diabetes should be designed not merely to maintain blood glucose control but also to minimize the development of complications. Evidence is accumulating that early control of diabetes can postpone and minimize the onset of such complications as retinopathy, neuropathy, severe atherosclerosis and renal vascular disease. **(Krause and Mahan, 1984)**

Increasing emphasis on cost control, health promotion, disease prevention, medical technology, and home care are among the factors that contribute to the growth of nutrition science and nutrition therapy. Other factors, such as an increasing elderly population, greater public health consciousness, and cultural diversity also contribute to the focus on nutrition. **(Marian, 1996)**