

LIVER FUNCTION PROFILE IN INSULIN DEPENDENT DIABETES MELLITUS (IDDM)

THESIS

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of the Master Degree

In
Pediatrics

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L I S T O F A B B R E V I A T I O N S

ALT	=	Alanine Transaminase
AST	=	Aspartate Transaminase
D. M.	=	Diabetes Mellitus
D.K.A.	=	Diabetic Keto-acidosis
G.D.M.	=	Gestational Diabetes Mellitus
G.G.T	=	Gamma Glutamyle Transferase
H.L.A	=	Human Leucocyte Antigen
I.D.D.M	=	Insulin Dependent Diabetes Mellitus
I.G.T.	=	Impaired Glucose Tolerance
M.R.D.M	=	Malnutrition Related Diabetes Mellitus
N.D.D.G	=	National diabetes data group
NIDDM	=	Non-Insulin Dependent Diabetes Mellitus
OGTT	=	Oral Glucose Tolerance Test
WHO	=	World Health Organization

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INTRODUCTION AND AIM OF WORK

I N T R O D U C T I O N

A N D A I M O F T H E W O R K

Type I diabetes is a syndrome characterized by a sudden clinical onset, severe hyperglycaemia, easy appearance of Keto-acidosis and severe insulin deficiency (Genuth, 1982).

The liver is probably the single most important regulatory site of glucose metabolism, and in patients with liver disease, disturbance of carbohydrate metabolism is common (Johnston and Alberti, 1976).

Disturbance of liver function in some patients with diabetes mellitus is well recognized but the precise relationship of diabetes mellitus to liver dysfunction has not been simply established (Felig and Sherwin, 1976).

So, it is important to study some aspects of liver function in insulin dependent diabetic children in order to detect early cases of liver affection that requires early management.

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REVIEW OF LITERATURE

DIABETES MELLITUS

Historical Review

Knowledge of diabetes mellitus dates back to centuries before christ. The Egyptian Papyrus Ebers described an illness associated with the passage of much urine. The first accurate clinical description of the disease was made by Aretaeus of Cappadocia in the second century A.D., who stated that diabetes is a wonderful affection, not very frequent among men, being a melting down of the flesh and limbs into urine. In the 3rd to 6th centuries A.D., scholars in China, Japan and India wrote about a condition with polyuria in which the urine was sweet and sticky. However, although it had been known for centuries that diabetic urine tasted sweet, it remained for Willis in 1674 to add the observation " as if imbued with honey and sugar". The name diabetes mellitus (mellitus = honey) was thus established (George and Cabill, 1985).

Definition

Diabetes mellitus is a grouping of anatomic and chemical problems resulting from a number of factors in

which an absolute or relative deficiency of insulin or its function usually is present. It tends to run in families, is associated with accelerated atherosclerosis, and predisposes to certain specific microvascular abnormalities including retinopathy, nephropathy and neuropathy (WHO, 1985).

Classification

During the last decade, the growth of knowledge regarding the etiology and pathogenesis of diabetes has led many individuals and groups in diabetes community to express the need for a revision of the nomenclature, diagnostic criteria and classification of D.M., seeking an international one if possible. To accomplish this task an international work group was held on April, 1978, under the supervision of The National Diabetes Data Group (NDDG) of The National Institute of Health (NIH) of U.S.A. There has been general acceptance of the classification adopted by The WHO Expert Committee on D.M. in 1980; however, a number of valuable comments and suggestions have since been made. These have now been incorporated into the classification and the revised version is given in table I (WHO, 1985).

The most important change from the previous classification is the appearance of malnutrition - related diabetes mellitus as a major clinical subclass, ranking with insulin dependent diabetes mellitus and non-insulin dependent diabetes mellitus.

Table I : Classification of diabetes mellitus and allied categories of glucose intolerance (quoted from WHO, 1985).

Class	Former Terminology
A. Clinical classes:	
1. Diabetes mellitus:	
a) Insulin dependent diabetes mellitus, (IDDM), Type I	Juvenile diabetes, Juvenile onset diabetes Ketosis-prone diabetes
b) Non-insulin dependent diabetes mellitus (NIDDM) Type II: - non-obese NIDDM - obese NIDDM	Adult - onset diabetes maturity-onset diabetes, ketosis - resistant diabetes
2. Malnutrition - related diabetes mellitus (MRDM)	
3. Other types of diabetes associated with certain conditions and syndromes:	Secondary diabetes

-----cont.-----

Class	Former Terminology
-Pancreatic disease -Disease of hormonal etiology -Drug-induced or chemical induced conditions -Abnormalities of insulin or its receptors - Other types	
4. Impaired glucose tolerance (IGT) a) Non-obese IGT b) Obese IGT c) IGT associated with conditions and syndromes	Asymptomatic diabetes, chemical diabetes, subclinical diabetes border-line diabetes
5. Gastrointestinal diabetes mellitus (GDM)	Gastrointestinal diabetes
B. Statistical Risk Classes	
(Subjects with normal glucose tolerance, but substantially increased risk of developing diabetes)	
1. Previous abnormality of glucose tolerance (Prev. AGT)	
2. Potential abnormality of glucose tolerance (Pot. AGT)	

Malnutrition Related Diabetes Mellitus (MRDM)

The introduction of this clinical class of diabetes mellitus in the classification of D.M. is in recognition of its clinical distinctiveness and severity, and its high prevalence in some tropical countries. This new category of diabetes includes the variety of types known in the past as tropical diabetes, pancreatic diabetes, ketosis resistant diabetes of young (WHO 1985).

A recent monograph has summarized the considerable epidemiological, clinical and biochemical information on MRDM, and has suggested the existence of at least two subclasses: -fibrocalculous pancreatic diabetes , and - protein - deficient pancreatic diabetes (Bajaj et al, 1984).

In several tropical countries, an estimated 20 - 70 % of diabetics first present below the age of 30 years. Many of them are seen during the childhood with recurrent attacks of abdominal pain. Males outnumber females by 3 to 1. In the subclass of fibrocalculous pancreatic diabetes, the patients are grossly underweight, and other stigmata of past or present malnutrition may be present (Mc Millan et al, 1979). The key metabolic features are moderate to severe