DIABETES MELLITUS CHALLENGES FOR THE FUTURE

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OUTLINE

Introduction

Diagnosis of Diabetes mellitus

- Value of GTT
- New Criteria
- Genetic markers

Etiology of Diabetes mellitus

- Genetic
- Autoimmunity
- Obesity
- receptors

Treatment

- General considerations
- Pancreatic transplantation
- Artificial pancreas
- Somatostatin and other compounds

Complications

- Sorbitol
- 2,3-DPG
- Control of various complications

Summary
INTRODUCTION

Diabetes mellitus remains an enigma in many ways in spite of the tremendous amount of research and writing that has occurred regarding this condition during the past 50 years. Nobel prizes have been awarded to Banting and Best (1922) for the discovery of insulin, Houssay (1937) for his pituitary investigations which spotlighted the extrapancreatic aspects of diabetes, to Sanger (1959) and colleagues for elucidating the amino acid structure of insulin, and to Sutherland and Rall (1958) for their classic studies in hormone action as manifest by changes in cyclic AMP.

In spite of these classical studies in diabetes that have received such widespread acclaim plus the exciting contributions of Yalow and Berson (1959) in developing the radioimmunoassay using insulin as a model and the important contribution of Steiner, Cunningham, Spigelman, and Aten (1967) in their pro-insulin studies, the exact answers to "What is Diabetes?" and "How does insulin work at the cellular level?" have not been found. Thus, we talk about a condition(s) that involves at least 5% of the population, doubles in incidence every 15 years, costs our economy six billion dollars per year, is the third leading cause of death, the most common cause of irreversible blindness, and the most important condition predisposing to accelerated vascular disease; yet, we are unsure as to what we are talking about. Considering the importance of diabetes and the impact that it makes each year on the health welfare of U.S. citizens alone, one is quite justified in suggesting that there are at least three more Nobel Prizes awaiting scientists in diabetic research: (1) the group that establishes concrete diagnostic tests for diabetes and elucidates the specific etiologies; (2) the group that discovers the mode of insulin action and via this develops more effective modes of therapy; and (3) the group that pinpoints the etiology and, hence, preventive methods for the complications of diabetes. These questions constitute challenges for the future.

One of the first challenges, however, is to establish adequate research funds to attract new scientists into the field of diabetes research. It is rather disconcerting to those interested in diabetes to note that as of 1975 there was only 43 million dollars allotted to diabetes research, as compared to 208 million dollars in heart research and 691 million dollars in cancer research. Significantly more money must be made available if research in diabetes is to prosper. The findings of the National Commission on Diabetes (Report of the National Commission on Diabetes to the Congress of the United States, submitted December 10, 1975) will, hopefully, stimulate an improvement in this regard.