

ectomy seems to be justified. The results to date must be viewed with conservatism, and the studies must be regarded as being in the field of clinical investigation of an illness for which there is no known effective method of treatment. Certainly any enthusiasm for the procedure in the far advanced type of case in which a radical approach to treatment seems most justifiable must be tempered by the realization that the lesions in the eyes and kidneys may already be essentially irreversible. Nevertheless, as of today, further experimental and clinical study of the whole matter seems desirable. Until the effects of hypophysectomy or adrenalectomy have been studied, it will be impossible to answer the practical question—do the results justify the means employed?

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HIGH REQUIREMENT FOR INSULIN FOLLOWING TOTAL PANCREATECTOMY

Human diabetes following total pancreatectomy is characterized for the most part by a low requirement for insulin, in the neighborhood of 40 units per day, and a rather marked sensitivity of its hypoglycemic effects. The small amount of insulin needed by these patients, compared with the much larger doses necessary in many with spontaneous diabetes, has been widely ascribed to the removal by pancreatectomy of the cells that make glucagon along with the cells that make insulin. The implication is that glucagon, the hyperglycemic-glycogenolytic factor, possesses physiologic activity and may, in the ordinary diabetic, either cause or mediate an increased need for insulin under certain conditions.

In the light of the foregoing, the recent report of Dituri¹ concerning insulin resistance after total pancrea-

tectomy is of special interest. Following the operation the patient was discharged taking 20 units of protamine zinc insulin daily. Subsequently it became necessary to increase the dose to a maximum of 180 units, an amount which still failed to control glycosuria completely. Upon readmission to the hospital for further study, infection, endocrine abnormalities and aberrations of diet were eliminated as possible causes of this high requirement. Antibodies to insulin, however, were demonstrated in the serum.

This is the largest daily insulin dosage recorded for a depancreatized patient. Dituri cites two additional cases, both complicated by infection, with maintenance requirements higher than usual, namely, 84 and 50 units. Careful persual of other reports reveals that not uncommonly doses in excess of 40 units must be given for brief intervals. The patient of Greenfield and Sanders,² for example, subjected to dental extractions while on a daily dose of 40 units, developed ketosis with a blood sugar level of over 400 mg. per 100 cc. and received an extra 45 units over a period of 12 hours.

These observations are not entirely surprising in view of the known hyperglycemic effects of febrile disease and other forms of stress, operating presumably through the pituitary-adrenal axis, in both experimental and clinical diabetes. The contribution they make is to show that glucagon is not a necessary factor in the increased requirement for insulin that accompanies these conditions. The possibility is not excluded, of course, that glucagon, when present in the intact pancreas, participates in the aggravation of diabetes either as an independent agent or as a link in the chain of other hormones which oppose the action of insulin.

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THE STUDENT-INTERN ESSAY CONTEST

One of the major objectives of the American Diabetes Association is professional education. Every effort is made to convey to as many physicians as possible all that is