didates for BIDS, despite the supposition that a major benefit of adding a sulfonylurea to insulin lies in improving the insulin responsiveness of tissues of obese persons. In a prospective trial of BIDS now underway we are limiting entry to persons weighing <150% of ideal and with diabetes ≤12 yr. We propose that, for properly selected persons incompletely responsive to a sulfonylurea alone, this regimen may prove a simple, safe, and effective therapeutic alternative.

MATTHEW C. RIDDLE, M.D.
JEAN S. HART, B.S.

From the Division of Endocrinology/Metabolism/Nutrition, Department of Medicine, Oregon Health Sciences University, Portland, Oregon 97201.

Address reprint requests to Matthew C. Riddle, M.D., at the above address.

REFERENCES

[1] Lotz, N., Lacher, F., and Bachmann, W.: Combination of sulfonylureas and insulin in the treatment of type II diabetes with secondary failure of sulfonylurea therapy. Diabetes 1984; 33 (Suppl. 1):24A.

[2] Dornhurst, A., Powell, S., and Pensky, J.: Tolazamide therapy in insulin treated type II diabetics reduces insulin dosage and improves glycemic control. Diabetes 1984; 33 (Suppl. 1):103A.

[3] Groop, L., Harno, K., Nousianinen, R., and Karonen, S.-L.: The combination of insulin with sulfonylurea in the treatment of maturity-onset diabetes. Acta Endocrinol. 1980; 94 (Suppl. 237):28.

[4] Fabrykant, M.: Use of Orinase as a basic adjuvant in management of insulin-dependent diabetes. Metabolism 1958; 7:213–21.

[5] Volk, B. W., and Lazarus, S. S.: Significance of effectiveness of combined insulin-Orinase treatment in maturity-onset diabetes. Am. J. Med. Sci. 1959; 237:1–7.

Empirical Determination of Diabetes Clinical Type

Clinical subtypes of diabetes mellitus have been promulgated by the National Diabetes Data Group,[1] namely, insulin-dependent diabetes mellitus (IDDM); non-insulin-dependent diabetes mellitus (NIDDM), with patients further divided into obese (obese NIDDM) and not obese (nonobese NIDDM) subgroups; and diabetes secondary to some other disease process or to the use of drugs that impair glucose metabolism (secondary diabetes mellitus). This categorization appears to represent a substantial improvement over the traditional "juvenile onset" and "maturity onset" dichotomy.[2] There are, however, important practical problems with using the new criteria in retrospective epidemiologic studies, especially those based on medical records. To obviate this difficulty, we proposed an empirical approach to the determination of clinical type through existing medical records.[2]

In our original report, we neglected to show how well this ad hoc classification performed in predicting the subsequent risk of ketoacidosis. These data are shown in Figure 1. By 20 yr after the initial diagnosis of diabetes, an actuarially estimated 35% of the patients classified as IDDM had experienced at least one episode of ketoacidosis. Comparable figures for obese and nonobese NIDDM patients were 2.7% and 4.4%, respectively. One of 29 patients with secondary diabetes (3.4%) developed ketoacidosis, but the experience of this group could not be estimated beyond 6 yr due to the small number of subjects being followed.

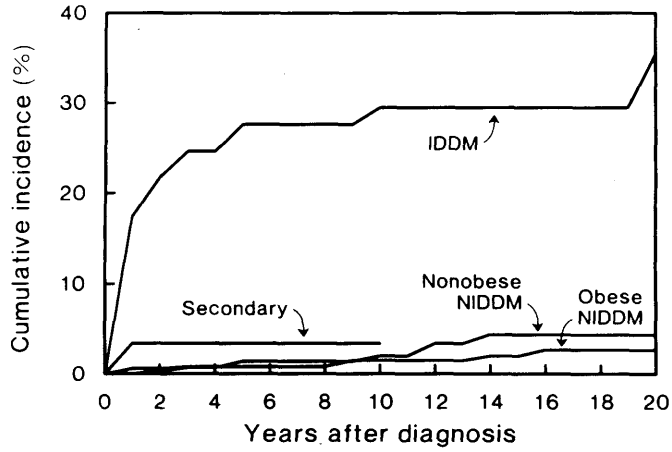

FIG. 1. Actuarially estimated cumulative incidence of ketoacidosis following the initial diagnosis of diabetes mellitus among Rochester, Minnesota residents with different clinical types of disease.

While the individuals classified as IDDM were at substantially increased risk of subsequent ketoacidosis, it must be noted that some patients not classified as IDDM also experienced ketoacidosis.

This may be due in part to misclassification. However, it also seems to result from non-insulin-dependent patients later developing insulin dependence, a phenomenon recognized by the National Diabetes Data Group.[1] This suggestion is supported by observations from earlier studies in this population, which revealed that patients not using insulin were placed on insulin therapy at the rate of over 2% per yr,[3] and that the initial episode of ketoacidosis often appeared only after diabetes of many years duration.[4]

Modern laboratory methods may permit more definitive determination of insulin dependence in prospective clinical studies. However, relatively arbitrary criteria are needed for investigations employing existing medical records, especially if older records must be used, as in the case of retrospective cohort studies. We suggest that investigators using medical records restrict insulin dependence at the time of diagnosis to the situation where a patient is started on insulin within 1 wk of diagnosis of diabetes and remains on that therapy for an extended period (arbitrarily defined here as 1 yr or until death), that the patient not be obese (relative weight less than 1.2), and that he or she display some evidence of ketosis or ketonuria.[2] The IDDM patients so restricted represent only one-third of all insulin users in the diabetic population. This approach identifies patients with the characteristics tradi-

tionally associated with IDDM and results in incidence rates for IDDM that are relatively stable throughout life.[2]

L. JOSEPH MELTON III, M.D.
PASQUALE J. PALUMBO, M.D.

From the Section of Clinical Epidemiology, Department of Medical Statistics and Epidemiology (L.J.M.), and Division of Endocrinology (P.J.P.), Department of Internal Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota 55905.

Address reprint requests to L. Joseph Melton III, M.D., Department of Medical Statistics and Epidemiology, Mayo Clinic, Rochester, Minnesota 55905.

REFERENCES

[1] National Diabetes Data Group: Classification and diagnosis of diabetes mellitus and other categories of glucose intolerance. Diabetes 1979; 28:1039–57.

[2] Melton, L. J., Palumbo, P. J., and Chu, C. P.: Incidence of diabetes mellitus by clinical type. Diabetes Care 1983; 6:75–86.

[3] Melton, L. J., Ochi, J. W., Palumbo, P. J., and Chu, C. P.: Sources of disparity in the spectrum of diabetes mellitus at incidence and prevalence. Diabetes Care 1983; 6:427–31.

[4] Johnson, D. D., Palumbo, P. J., and Chu, C. P.: Diabetic ketoacidosis in a community-based population. Mayo Clin. Proc. 1980; 55:83–88.