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## The Lost Symposium

### Diabetes and Exercise 1990

The term lost has been applied by historians to a generation of people and by Hollywood to describe a missing weekend. Likewise, musicologists have their lost chord and the Bible its lost tribes. This letter deals with what may be the first instance of a lost symposium. The symposium in question is entitled “Diabetes and Exercise 1990,” and it occupies pages 1675–1813 of the November 1992 issue of *Diabetes Care*. Unfortunately, the table of contents in this issue did not list the 19 individual articles and, as a result, many readers were not aware of their presence. This lack of identification has been rectified, and thanks to the efforts of Allan Drash and the editorial staff of *Diabetes Care*, a full table of contents appeared in the January 1993 issue.

Over the past 20 years, the view of physicians and scientists concerning the role of exercise in diabetes therapy has been on a roller coaster. In the 1970s, enthusiasm was high, as studies in humans and experimental animals and the development of new methods to study muscle, in vitro, led to a vast increase in our understanding of both the

metabolism of exercise and how it is altered in patients with types I and II diabetes. Much of this work was summarized at a milestone Kroc Foundation Conference on Diabetes and Exercise held in Santa Ynez, California in 1979 (1). Also presented at this meeting were the first reports suggesting that physical activity might be useful in improving glucose homeostasis and in diminishing coronary risk factors in patients with type II diabetes.

The next half-dozen years were characterized by a flurry of activity in the study of diabetes and exercise. The combined effect of exogenous insulin and physical activity on glucose homeostasis in patients with type I diabetes was clarified (2). In addition, the basic elements of the exercise prescription (3) and its potential benefits in patients with type II diabetes (3,4) were defined more conclusively. Thus, clear-cut improvement in HbA<sub>1c</sub> levels, glucose tolerance, plasma triglycerides, and in some instances, blood pressure, were noted by numerous investigators in patients performing endurance-type exercise at least three times/wk. Likewise, because of the increase in insulin sensitivity that it caused, the notion that physical training might be useful in treating other disorders characterized by hyperinsulinemia and insulin resistance was proposed (5). Singled out in this regard were hypertriglyceridemia, essential hypertension, and coronary heart disease. Contemporary epidemiological studies that demonstrated that heart attacks are less frequent in physically active individuals (3) and that hyperinsulinemia may be an independent risk factor for coronary heart disease added greatly to the momentum of this idea (3).

Soon after the initial burst of interest in its use, it became apparent that exercise could be used only to improve glycemic control in a small percentage of patients with type I diabetes. Also, the results of long-term exercise programs in patients with type II diabetes, especially the elderly, were often disappointing because of a high drop-out rate (6) and

because of the relatively modest improvement achieved in many patients. Furthermore, in many type II diabetic patients, the ability to exercise was limited as a result of clinically significant vascular disease and/or neuropathy. Largely for these reasons, an NIH consensus panel issued in 1988 a “somewhat controversial, rather sobering statement . . . that downplayed the role of exercise in the management of type II diabetes (7,8).”

“Why then did a rather large group of clinical diabetologists, epidemiologists, physiologists, biochemists, and exercise physiologists feel it appropriate to meet for a symposium on diabetes and exercise in May 1990 (8)?” In part, the symposium was undoubtedly a response to the NIH statement. In addition, several concurrent developments made the timing of the meeting particularly appropriate. One of these was the tremendous increase in the interest of patients with diabetes in sports and physical activity. As pointed out in the original introduction to the symposium (8), a “drastic increase in the number of publications directed to sports activities in journals edited for diabetic patients all over the world” has occurred. Also, “much of the momentum motivating clinical diabetologists to reinvestigate a number of aspects of acute exercise in insulin-dependent (type I) diabetes has been prompted by the activities following the 1988 founding of the IDAA in Arizona.” In keeping with the increasingly greater participation of diabetic patients in exercise, the history and purpose of the IDAA were described at the symposium by Harper and Thurm, and a written version of their presentation appears in the proceedings.

The symposium also occurred at a time when important new insights were being made into the molecular biology and physiology of glucose transport. The GLUT4 glucose transporter had been discovered and its gene cloned in the preceding two years. At the symposium, this work as well as newer studies of the

