I'm Running on Insulin

Summary of the history of the International Diabetic Athletes Association

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The changes that physical activity brings in the functioning of the human body have a special interest to active individuals with diabetes. Certain adjustments in dosing are necessary. Even today, with such an emphasis on healthy life-style, little information is available to assist an individual with diabetes to exercise safely. Granted, no easy formula exists. Many different factors influence blood glucose. Most often, individuals with diabetes learn by trial and error how to best manage their favorite activity. In 1985, Paula Harper founded the International Diabetic Athletes Association (IDAA) in hopes of educating people with diabetes about the benefits of regular exercise. For most individuals with insulin-dependent (type I) diabetes mellitus, it is not encouragement, but safety that is the issue. The IDAA offers great opportunities for sharing ideas at its annual meetings. These meetings attract an exceptional faculty of speakers and offer a mix of workshops led by experienced diabetic athletes on various sports. A quarterly newsletter is published that presents new information and recognizes success stories. IDDA chapters exist in the U.S., Canada, U.K., Germany, France, Luxembourg, Switzerland, Belgium, the Netherlands, and Spain.

The complex mechanism of metabolism activated by an individual under physical activity has always caused special interest by medical researchers. In the case of the insulin-dependent (type I) diabetic patient, insulin treatment needs to be adjusted to the altered metabolic situation before, during, and after physical exercise.

A team of experts (among them E. Horton, M. Vranic, B. Zinman, M. Berger, and others) meets at regular intervals to gain new insight into the challenging and sometimes controversial field of "diabetes and exercise." However, it is a long way from scientific studies to the diabetes treatment centers, and the transition from theory to practice is often difficult.

Some conclusions from results of scientific studies proved to be very far from practice:

1. Which athlete likes to run with 60 g of carbohydrates in his stomach?
2. Who wants to work out at the same time and with the same intensity every day?

Therefore, most diabetic athletes had to find their own way of integrating physical exercise into their lives by "trial and error." Since 1985, they have found a way to share their knowledge with interested scientists, doctors, physical therapists, sports coaches, Certified Diabetes Educators (CDEs), and most of the sport enthusiasts among diabetics. The initiator of this movement and now the President of the International Diabetic Athletes Association (IDAA), Paula Harper, recalls that the very first steps toward this organization were exhausting in every respect.

"I embarked on a running program in 1976 with little information about how it would affect my type I diabetes. I developed a training regimen to build my endurance and within 1 yr entered my first marathon race. I went on to complete 30 more marathons, one ultramarathon (50 miles), as well as five triathlons, and six century (100 plus miles) bicycle races. That was quite an athletic feat for someone who previously was not big on exercise. The problem came when I sought medical advice for training. I was most often told not to do it or given inadequate or misleading advice. My heritage is German, so being told no was not about to stop me. Stubborn is what my husband calls me. I was troubled to learn that doctors had little helpful advice and were generally unwilling to work with me.

I set out on training runs, kept good records to chart my progress, and learned the most by 'trial and error.' In retrospect, what I did seems scary. These were the days before home blood glucose monitoring, and I am sure there were times when I exercised with my blood glucose too high or too low. With miles to go in one marathon, I had exhausted my supply of sugar-containing snacks and was experiencing low blood glucose because of poor advice by my physician about the amount of insulin to take for

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Table 1—*Chapters of the IDAA*

EUROPE	NORTH AMERICA	ASIA
BELGIUM	CANADA	JAPAN*
	VANCOUVER, BC	
ENGLAND	UNITED STATES	
	ATLANTA, GA	
FRANCE	BOCA RATON, FL*	
GERMANY	BOSTON, MA*	
GREECE*	CHARLESTON, SC*	
LUXEMBOURG	CHATSWORTH, CA	
POLAND*	DELAWARE VALLEY, PA	
SPAIN	LONG BEACH, CA	
SWITZERLAND	MILWAUKEE, WI*	
	MINNEAPOLIS, MN	
	NASHVILLE, TN	
	NEW YORK CITY, NY	
	PHOENIX, AZ	
	SALT LAKE CITY, UT*	
	SAN DIEGO, CA*	
	WICHITA, KS*	

*Organizing.

this endurance event. I was urged to drop out of the race. I would not think of it. Someone at an aid station gave me a soda, a policeman handed me a pack of chewing gum, and I crossed the finish line feeling better than I had during the middle of the race. Granted, this is not the optimal plan for running a 26 mile distance, but it worked. I was not fast, but I was never a quitter.

'I Run on Insulin' became my byword. I had it printed on the back of a tee shirt and to my surprise, when I wore it in races, I made many new friends who also had diabetes and endured similar problems. This growing network of active people with diabetes was actually the first step in starting the IDAA. I learned of many young athletes who were being kept from participation because of coaches' fears of difficulties with blood glucose regulation, and I realized the need for education and the crime in turning off youngsters to sports. I feel that the characteristics that allow an athlete to compete successfully and also to maintain good blood glucose control are essentially identical:

1. The desire to do the job right (the ability to make a short- and long-range commitment to learn about the disease continually and to make the necessary adjustments in life-style that are required for excellent glucose control).

2. An understanding how the game is played and what must be done to succeed (detailed knowledge about the pathophysiology of diabetes, the various types of insulin and their actions, and the effect of diet and exercise on blood glucose regulation).

3. The discipline to do what is needed consistently to succeed (to monitor blood glucose methodically multiple times daily, to avoid unhealthy diet and activity patterns while making healthy alternatives a routine part of one's daily life).

4. Skill (the ability to check blood glucose accurately and to choose the appropriate dietary manipulations to prevent major swings in blood glucose before, during, and after exercise)."

This enthusiasm quickly crossed the borders, and some months later similar groups were founded all over Europe. Soon, we hope to have groups in Africa, Australia, and Japan (Table 1).

Wherever active diabetic people arranged meetings and planned common sporting activities, the response was overwhelming. On 18–19 May 1990, 22 type I diabetic athletes proved, with a 250 km bicycle endurance tour down the Rhine Valley in Germany, that the diagnosis of diabetes mellitus was no longer synonymous with physical weakness. They proved Joslin's 1922 thesis that the therapy can be managed very successfully if the physicians educate their patients to become their own doctors. Today, many innovations in the therapy of diabetes allow the diabetic patient to live an almost "normal" life. It is no longer necessary to follow strict diets or to adhere to a strictly regulated schedule in an attempt to compensate for the shortcomings of insulin treatment.

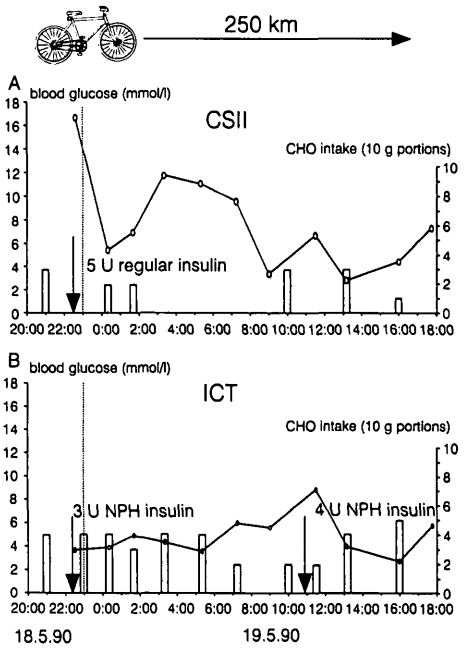

Figure 1—*A: blood glucose, carbohydrate (CHO) intake, and insulin therapy in a 26-yr-old female type I diabetic on insulin pump therapy (continuous subcutaneous insulin infusion [CSII]) before and during a 250 km bike race starting at 2300 on May 18, 1990 and finishing at 1600 on 19 May 1990. Usual daily dose of insulin in this patient was a basal rate of 24 U/24 h and total bolus dose of 25 U. CHO intake was 100 g/day. During the race, the dose was reduced to a basal rate of 12 U/24 h (50% of usual dose) and total bolus dose of 5 U (20% of usual dose). CHO intake during the race was 160 g (160% of usual intake). B: blood glucose, CHO intake, and insulin therapy from a 32-yr-old male type I diabetic with multiple injections (ICT) of NPH and regular insulin. Usual daily dosages were 14 U of NPH insulin/day in two divided dosage and 24 U of regular insulin. Usual CHO intake was 170 g/day. During the race, the NPH dose was reduced to 7 U (50% of usual dose) and no regular insulin. CHO intake was 340 g (200% of usual intake).*

Diabetic patients need motivation to do everything possible in order to reach good metabolic control. Those 22

cycling athletes were full of motivation in every way, and they all finished the tour without any hypo- or hyperglycemic episodes. On this occasion, the metabolic swings were documented because a blood test had to be done every 30 km.

Very different strategies of diabetes treatment met in this international group of cyclists: mixtures of conventional and multiple injections (ICT) and insulin pump therapy (continuous subcutaneous insulin infusion). There was a wide range of variation adjustments to this unusual endurance test starting on 18 May 1990, 1 h before midnight and lasting all through the next day without any long rest. The reduction of the basal insulin ranged from 50 to 90%. The increase of carbohydrates rose to 150% or 400 g (Fig. 1).

All participants on the bike tour realized how many different factors influenced blood glucose measurement, including 1. intensity of physical activity, 2. duration of physical activity, 3. kind of physical activity, 4. time of day, 5. amount of ingested carbohydrates, 6. serum insulin level, 7. amount of injected insulin, 8. time of insulin injection, 9. kind of insulin used (NPH or short acting), 10. insulin injection site, 11. level of physical fitness, and 12. blood glucose level at the beginning of exercise.

Because of this large number of influencing factors and interferences, one cannot give fixed rules for the adjustment of insulin dosages in connection with exercise that might apply to every diabetic person. Doctors have to consider the individual needs of each patient. Data gathered during this bike tour and similar events and experiences gathered within the IDAA can be an enormous help with this task. Among the IDAA members are experienced diabetics like Werner Beckhorst (age 64), who has had diabetes for 49 yr. Sports has helped him go through all these years without developing any late complications.

Professionals like Jonathan Hayes (tight end for the Kansas City Chiefs), Bill Carlson, the Iron Man Triathlete (consisting of 3.6 km swimming, 180 km cycling, and a marathon run), Steve Prostermann (a scuba diver who runs his own diving school on the Virgin Islands), Urban Miyares (who set the record in blind downhill skiing), and other marathon runners, ultracyclists, sport pilots, skydivers, can most effectively help newly diagnosed diabetics by telling their story and proving that diabetes is no reason for not being successful in sports, in daily life, or on the job. The IDAA meetings and their events help to spread this spirit. For the participants, the bike tour was an unforgettable experience, not only because of the metabolic viewpoint but also, more importantly, because of the wonderful atmosphere within the team.

Confidence in one's physical abilities, the accomplishment of high goals by set training, the increase in physical power by training, and the strength one gets from the support in this special group of diabetic athletes contribute to a positive attitude toward the disease. Group camaraderie gives members the motivation and willpower not to consider diabetes as a life burden.

This is the real and most important reason for the existence and continuously fast growth of the IDAA (more than 1500 members) and for the growing numbers of exercising diabetics. The slogan by Curt Fraser (a professional ice-hockey player for the Chicago Black Hawks' Minnesota North Stars and for the Canadian National Team), says it all, "It is true that exercising with diabetes demands some juggling, but it is worth all the effort required considering what you get!"

There is still a lot to be done. The IDAA, an independent nonprofit organization is working on the following concepts:

1. Collecting research material to initiate a change in traditional medical opinions about diabetes and exercise, still a highly controversial subject (Exercise must never be prescribed as an aid to regulate faulty insulin therapy, to be given in exact doses of physical charge-ups just like a restrictive diet. It should be enjoyed as a source of increased quality of life and independence. Therefore, any necessary information should be made available to all interested diabetics, enabling them to perform any kind of long- or short-term exercise they like.)

2. Providing opportunities for the open sharing of information and skills necessary for the successful integration of diabetes and a vigorous life-style

3. Educating diabetic patients, doctors, and sports coaches

4. Establishing information centers, arranging for supervision, and exchanging personal experiences between diabetic athletes as "help to help yourself"

In some countries, specific diabetes and exercise journals are published, widely dispersing this much-needed information: U.S.—*Challenge*; U.K.—*Di-active*; France, Belgium, Luxembourg, and Switzerland—*Le Défi*; Spain—*Esport y Vida*; and Germany—*Mellitus-Lauf*.

For more information, contact Paula Harper.