

## DIABETES AND DIVING

Fred Bove

Diabetics who are not insulin dependent do not have a problem with hypoglycaemia. So diving is appropriate for non-insulin dependent diabetics who are controlled by diet or an oral agent. Perhaps they should not take the oral agent, or be sure to eat breakfast, the morning that they are diving minimise the risk of hypoglycaemia but it is rare in this group.

I consider that insulin dependent divers should not dive. The danger is that exercise can produce hypoglycaemia, which can cause unconsciousness and unconsciousness underwater is often fatal. However some insulin dependent diabetics do dive. There are unstable diabetics and some with complications who have particularly severe problems and should not even consider diving.

The YMCA in the US, which was the first agency to train divers and have a certification program, reduced emphasis on diver training and was superseded by NAUI and PADI as the two major training organisations. Now they have reorganised their diver training program and are training handicapped divers. They train paraplegics and quadriplegics and other divers who are handicapped. They consider diabetes as a handicap and their attitude is that handicapped people should be allowed to dive. There is now a program in the US to get insulin dependent diabetics into diving. The program is based on blood sugar estimations before diving. The divers take their glucometers on the boat and do their finger pricks just before they get into the water to be sure that the blood sugar is in the right range. If it is not, they take some glucose or orange juice. Precautions include having glucagon ready in syringes on deck. I do not think that this is an inherently safe program. I hope that we can at least prevail upon the organisers to select out, as too severely handicapped, the divers who are late diabetics (ie have had diabetes for over 15 years), who have no glucagon, poor blood sugar control or autonomic neuropathy with inadequate epinephrine (adrenalin) response to hypoglycaemia. I fear that they may not screen out these subjects.

They also have quadriplegics diving. A quadriplegic, paralysed from the neck down, dressed in full diving gear, is unable to control his progress or buoyancy in the water. They often are driven by currents into reefs and other objects, but some of them enjoy their diving. Unfortunately instructors may think that severely impaired diabetics are just more severely handicapped and more deserving of being trained to dive.

I do not think we should be approving insulin dependent diabetics to dive, unless there is a well

organised handicapped diver program to train them.

### Audience participation

John Parker

I have read of diabetic patients under treatment in hyperbaric chambers whose blood glucose dropped while normal controls either maintained their blood glucose or it went up. You have only mentioned exercise. Is there a hyperbaric component?

Bove

I do not think there is. One would have to look at the circumstances in which the diabetic was treated. It is common for a patient going to hospital for a test or treatment to be told "Don't eat any breakfast". But not everybody remembers to tell the diabetic "If you don't eat any breakfast don't take your insulin". So many diabetics show up at hospital with 30 or 40 units of insulin subcutaneously and no breakfast. This person will clearly get hypoglycaemic by 10.30 in the morning. I think that one would have to look at the circumstances of those hyperbaric events to understand them, but I have not seen anything which indicates that hyperbaria per se will lower the blood sugar.

Unidentified speaker

Do you think it is worthwhile testing for autonomic neuropathy?

Bove

The common problems in autonomic neuropathy are orthostasis and severe gastroparesis. Orthostasis is easy to test for, in fact most sufferers would tell you that they feel faint on standing up. If orthostasis is present you know there is autonomic neuropathy. Gastroparesis causes problems with GI motility. These are severe stages of autonomic neuropathy. If one takes a good history, has the patient sit up and measures supine and sitting blood pressure, if the patient is not on anti-hypertensives, a fall in blood pressure would identify autonomic neuropathy without going through formal tilt testing.

Guy Williams

As a general practitioner I have noticed that insulin dependent diabetics will describe instability with stress, anxiety and emotional factors. Diabetics are not just biochemical or physiological preparations. They certainly have times when blood sugar control is worse than usual. In diving there are stressful moments.

Bove

I do not think it is fair to make a blanket statement that all diabetics are emotionally unstable. A lot of younger diabetics are emotionally labile because of the chronic stress of having to be dependent on a daily injection. Some teenagers rebel, do not regulate insulin properly and get

