ADS Position Statements

1994
SCUBA Diving

Jim Hazel, Westmead, NSW

SCUBA DIVING AND DIABETES

DEFINITION

Self Contained Underwater Breathing Apparatus (SCUBA) diving has increased spectacularly in both professional and recreational spheres since the end of the second World War. Not only SCUBA diving but the form of diving known as saturation diving (from a submerged habitat) is also widespread in the commercial sphere e.g., in offshore mining activities.

The term SCUBA in this paper shall be deemed to include all forms of breathing air or other gas mixes under pressure, whether it be by self contained underwater breathing apparatus, air pumped via a line from the surface or saturation diving in a submersible habitat.

QUALIFICATIONS

Recreational divers form the vast majority of divers. They participate in SCUBA diving, generally at weekends or on holidays, for various pleasures and interests which include simple sight-seeing, marine biology, exploring wrecks, cave diving etc. These people acquire their basic qualifications, generally referred to as a "C Card", from a recognised SCUBA instruction school. The C Card is recognised internationally. It certifies that the named bearer has completed a course to the satisfaction of the instructor and is certified to undertake diving with SCUBA gear. The C Card does not carry qualifications as to the environment in which diving may be undertaken, the depth or conditions which a diver is deemed fit to encounter, or other qualifications of any kind. If a diver is certified after having satisfied a SCUBA school of his ability to dive, then by implication, he is considered to have maintained and increased his expertise through regular diving. C Cards are issued by several organisations including the Federation of Australian Underwater Instructors (FAUI), Professional Association of Diving Instructors (PADI) and the National Association of Underwater Instructors (NAUI). Lately, another international organisation, known as SCUBA Schools International (SSI), has made a strong entry into the Australian diving instructional scene.

All these organisations, except the Australian Organisation, FAUI, are signatories of The Recreational Scuba Training Council (RSTC) of the USA and conform to the American National Standards Institute (ANSI) standard: Revised Instructional Standards Minimal Course Content for Entry Level SCUBA Certification (revised edition, September 1st 1986).

Implicit in the standards of all the major diving organisations is that an Entry Level diver is qualified to plan and execute dives to 18 meters. The standards seek to enforce the follow depth level restrictions:

Entry Level- restricted to a depth of 18 meters and less
Advanced Divers -restricted to a depth of 30 meters and less.

An absolute maximum for Recreational Divers is 39 metres. On commercial charter boats engaged in diving expeditions with recreational divers, the skippers or Dive Masters nowadays pay quite a deal of attention to the qualifications and experience of the divers in the group and seek to enforce

limits. They have, however, no legal responsibility to do so, although in their capacities they have the discretion to refuse participation to any person.

MEDICAL REQUIREMENTS

All SCUBA schools request a medical certificate before an applicant for instruction undertakes SCUBA training. There is no legal requirement for this certificate despite the fact that the medical aspects of compressed air diving are complex and the practice of diving is dangerous with regard to many medical conditions. In most countries of the world, Underwater or Diving Medicine, or Hyperbaric Medicine, is a recognised speciality.

In Australia there is an organisation of medical and paramedical people with special expertise in the field of underwater medicine known as the South Pacific Underwater Medicine Society (SPUMS). This organisation and its diploma are not recognised by government or by any of the learned medical colleges or boards.

The requirement of a medical certificate to undertake SCUBA training is also not standardized; a certificate from any registered medical practitioner is accepted by a SCUBA school. Needless to say, the vast majority of medical certificates are issued by doctors who are ignorant of the large number of complex issues involved in compressed air diving and the validity of medical certification under these circumstances is open to question. Furthermore, The Health Insurance Commission does not give any benefits for examinations for any sporting activity, diving included.

The requirements for selection as a diver in the Armed Services are simple and straightforward and basically state that any person suffering from a disease which is liable to produce unpredictable unconsciousness is ineligible for SCUBA diving. The Armed Services, with their particular structure, have no difficulties ruling out completely anyone with cardiac arrhythmia's, epilepsy, syncopal attacks or diabetes. This applies to clearance divers in the Army as well as the Navy, in fact, the Royal Australian Navy regards insulin-dependent diabetes as grounds for ineligibility or dismissal, and no amount of argument seems capable of dissuading them.

Professional diving is also strictly regulated by insurance companies. The standard for commercial diving is laid down by the Australian Standards Association in the newly revised AS-2299, in which insulin dependent diabetes is an absolute contra-indication to professional certification.

HAZARDS, WITH PARTICULAR REFERENCE TO PERSONS WITH INSULIN DEPENDENT DIABETES.

Recreational divers may be subject to a great many stresses that non-diving physicians may find difficult to envisage. Not only are there the spectacular and well-publicised effects of increased pressure with the problems of decompression sickness ("The Bends") and air embolism, but other less well-publicised dangers. It is a truism that most diving accidents occur on the surface, related to boating and wave action etc. From the point of view of compression and decompression accidents, the most dangerous area is from the surface to a depth of 10 meters, where the greatest relative changes in volume/pressure occur.

The depth limitations being sought by professional associations have implications with regard to diving conditions in so far as depth limitations will tend to limit diving to less exposed areas and sites that are closer to shore. Hence, they impose certain conditions that may be safer for the less experienced divers.

The most important consideration, however from the point of view of any diver, but particularly one with insulin-dependent diabetes, is the unpredictability of diving conditions. Experienced divers and diving instructors are quick to point this out. What may be carefully chosen as a relatively safe dive physical exertion under extremely adverse conditions with minimal room and time for recovery. Sudden changes in weather conditions, currents or in the dependency of another diver may produce life-threatening emergencies that require the diver to exercise cool judgement under threatening conditions. For example, divers may (and frequently do) become entangled in invisible nylon fishing lines that have broken off under water, and may be unable to extricate themselves without the assistance of a buddy. This danger frequently occurs under overhanging rocks or in small caves, areas which recreational divers like to explore. Under such conditions exhaustion of the air supply can occur rapidly and may lead to a life-threatening emergency. Similarly, a boat left on the surface a few miles from shore, even under ideal weather conditions, may later be swept away while divers are underwater: returning to the surface, the divers may be faced with a swim of several hours, now in rough water conditions, to get to the shore. These are but two examples of a large number of possible threatening situations. It is not difficult to appreciate that a diver with insulin-dependent diabetes would be at greatly increased risk in these situations.

With the potential for difficulties as they are, one does not need to add the possibility of an extra acute complication i.e hypoglycaemia, in a diver with insulin-dependent diabetes, in a situation where no remedial action can be taken and where maximal functioning and moto re co-ordination will be required.

There are numerous instances where persons with insulin-dependent diabetes have participated in SCUBA diving without ill-effects, and some of these are known to the writer. This does not minimise the argument, that the risks involved are unacceptably high and add another dimension to an already high risk sport.

DIVING AND NON-INSULIN DEPENDENT DIABETES MELLITUS

In persons with non-insulin dependent diabetes a judgement on diving risks has to be made on an individual basis. Most persons with non-insulin dependent diabetes are not prone to hypoglycemia, but if they are so prone while taking oral hypoglycemia agents this would have obvious significance. Evidence would need to be available on the stability of diabetes control. Consumption of an adequate amount of carbohydrate before a dive is considerably easier for a person with non-insulin dependent diabetes than for those with insulin-dependent diabetes. Nevertheless, it must be stressed that there are many other medical aspects relevant to diving that frequently co-exist in persons with both non-insulin dependent and insulin dependent

diabetes which are, respiratory disease, oto-rhinolaryngological disease as well as musuloskeletal problems.

DO DIVERS WITH DIABETES HAVE A HIGHER INCIDENCE OF ACCIDENTS?

Statistics on diving accidents are difficult to obtain. The findings of Coroner's Courts are usually unreliable as expert evidence is not always sought and a diagnosis of "drowning" or "The Bends" is frequently entered when another diagnosis, for example, air embolism, is correct. Dr. Douglas Walker of Sydney has, for more than 10 years, conducted a watching study on diving incidents called "Operation Stickybeak" privately on behalf of The Pacific Underwater Medicine Society. He has evidence of a significant number of serious accidents, and deaths, in persons with insulin-dependent diabetes while SCUBA diving. In addition, other cases can be sited by the author.

RESUSCITATION AFTER A DIVE ACCIDENT

In the event of a diving accident the diver is usually several miles off-shore in, or near, a boat. Companions would assume, reasonably, that an unconscious diver retrieved from the water, has suffered a specific diving accident such as decompression sickness or more likely air embolism. The consequence of this would be that in the time taken to transport an unconscious diver to medical assistance, non-medical people would render simple first-aid, they would almost certainly place the diver in a head-down position and give him or her oxygen. Some time may elapse before a diver actually reaches medical help. Even then, hypoglycaemia in a diver with insulin-dependent diabetes may not be uppermost in the mind of the attending medical officers.

SUMMARY

SCUBA diving involves inherent risks which may be unpredictable and of sudden onset and require maximal, sustained motor activity and cool judgement to prevent serious injury or death. Persons with diabetes may experience problems eg. hypoglycaemia, in situations where it would be difficult or impossible to render emergency treatment i.e. underwater.

The decision whether a person is fit or unfit to participate in SCUBA diving is one that diabetologists may not be competent to make without guidance from a medical specialist in underwater medicine. As far as the writer is aware, all underwater medical authorities in the world share the opinion that insulin-dependent diabetes is an absolute contradiction to SCUBA diving.

RECOMMENDATION

It is recommended that the Australian Diabetes Society adopt the following policy on SCUBA diving and Diabetes.

1. that **insulin dependent diabetes is an absolute contra-indication** to Entry Level SCUBA diving.

2. that *non-insulin dependent diabetes* is a *relative contra-indication* to Entry Level SCUBA diving and that suitability for entry be determined by consultation with a physician specialising in the care of patients with diabetes in conjunction with an underwater medical specialist.