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Recommended Further Reading

British Sub-Aqua Club Diver Training Material - Supplement to Sports Diver and Dive Leader Training Handbook (Lessons ST 6: ST 7: LT 6 using BS-AC '88 decompression tables with theory questions and answers). BS-AC, London, 1988

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The author wishes to thank Dr Tom Hennessy for perusing the draft of this chapter and for the material and assistance he provided.

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AN ATYPICAL EPISODE OF DECOMPRESSION SICKNESS

Hamish Holland

Summary

A case is presented of a novice diver in whom symptoms consistent with decompression sickness developed after diving to a depth of 7 metres of sea water (msw). Resolution followed hyperbaric oxygen therapy.

Introduction

The diagnosis of decompression sickness (DCS) in divers is heavily dependent on the history with considerable weight given to the dive profile. Various "safe" decompression tables are published, and it is generally accepted that symptomatic DCS is extremely rare following exposure to pressures less than 2 ATA.¹

A case is presented of a novice diver who developed symptoms after shallow training dives, in whom DCS is the only tenable diagnosis.

Case Report

The patient was a 16 year old girl, performing her first training dives in the open sea. The dive series commenced at 1300 hours, and consisted of two dives to a maximum of 7 metres for 15 minutes each, then a 30 minute break and four descents to 4 metres maximum over 40 minutes. The dive profile was confirmed by her instructor, and the dives were uneventful.

By 1800 hours, she reported aching knees and jaw, and a feeling as if her ears were not equalised. The pain continued overnight and was sufficient to disturb her sleep.

The next day, the jaw was easier but her knees had not improved. In addition, she had a headache, pins and needles in both legs, and occasional sharp pains in ankles, wrists, elbows and shoulders. She presented to her local hospital that day, and was transferred to the Royal Darwin Hospital (RDH) 2 days after her dives, arriving at 1330 hours.

On arrival at RDH, she still had aching knees, pain in her shoulders, and an occipital headache, but all other symptoms had resolved.

The patient stated she normally enjoyed good health apart from occasional attacks of tonsillitis. She had not noticed any fever, rash, weakness or lethargy although she had been resting in bed since the day of the dives. She had no abdominal pain, nausea or vomiting, and no urinary symptoms. She comes from an area where ciguatera occurs, and eats a large amount of fish, but no other family members reported any malaise. She has had no previous episodes of ciguatera.

On examination, she proved to be alert and fully orientated, with no nystagmus, no limb weakness, normal tone and no clonus. Reflexes, including plantars, were normal and no sensory loss was detectable. She was afebrile with no skin rash and no lymphadenopathy. Respiratory and cardiovascular examination was normal, as were her eardrums. Her joints displayed a full range of movement and did not show swelling, tenderness or localised warmth.

Chest x-ray was normal. Her haematocrit was 0.43 (normal 0.36-0.47). Over the previous 24 hours she had been allowed a normal oral intake as well as receiving one litre of crystalloid intravenously. She had been kept on 50% oxygen for this time.

It was decided to use hyperbaric oxygen treatment, with table RN 62, as DCS was possible. At the end of the second oxygen period, she still complained of knee pains and headache but these vanished during the third oxygen period.

Symptoms did not recur and the patient was discharged four days after her dives, and reviewed a week later. Negative results for RA latex, Epstein-Barr virus, Ross River virus, and an autoantibody screen were obtained.

Discussion

The symptoms in this case are consistent with DCS, and did resolve with hyperbaric oxygen, even though the dive does not support this diagnosis. However, no evidence was obtained to support the alternatives of ciguatera, marine envenomation and unrelated polyarthritis. Current theories of DCS support the concept of "silent bubble" formation possibly occurring with any decompression, both intravascularly and in the tissues. The safe depth of 10 msw merely refers to the development of symptoms. It is to be expected that some people will either produce more bubbles, or suffer symptoms with fewer bubbles, than most of the population. This assumption predicts that occasional victims of DCS will be extremely susceptible and reinforces the statistical nature of the dive table. It is impossible to produce a dive table and say DCS will be eliminated by following its guidelines.

Bubble formation in tissues presumably causes symptoms by compression and ischaemia. Intravenous bubble formation (asymptomatic) has been reported after 18% of dives (depths ranging from 6-39 msw), but after 25% of dives deeper than 25 msw.² These bubbles are not sufficient to cause symptoms of gas embolisation, however they do cause complement activation in a proportion of the population.³ The rise in right atrial pressure which follows immersion would encourage transfer of these venous bubbles to the arterial side of the circulation.⁴ 37% of a sample of divers with DCS showed right to left shunting through a patent foramen ovale as against 5% of the normal population.⁵

It is apparent that anatomical and physiological factors predispose some divers to the development of DCS and these people should be very cautious about continuing their diving careers.

In spite of resistance from the patient, her family, and the local diving fraternity, she has been advised to accept the diagnosis of DCS and told that in her case, it is not possible

to state a time after which further diving will be safe.

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REVIEW OF 1000 SPORTS DIVING MEDICALS

John Parker

Introduction

A diving medical is a medical examination which concludes in a professional opinion whether a person, by reason of their present medical state, is in danger of adversely affecting their health if they scuba dive.

Being a professional opinion it can be challenged. A doctor must be able to justify his decision in light of current medical knowledge and opinion.

No mortality or serious injury is acceptable in diving. Should a person be placed in any risk of this by their present medical state, they must fail.

Should a person be more liable to suffer a minor injury because of their medical state, then they must be forewarned of the dangers and instructed how to avoid such an injury.