Short reports

Dysbaric hazard of a new fishing method in Hong Kong : case report

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Commercial fishing is a hazardous occupation in which the main danger is usually from drowning. Fishermen in Hong Kong recently adopted a new method of catching fish, and the occurrence of a case confirms that decompression sickness is an associated health risk. We describe the circumstances and the case.

Background

About two years ago local fishermen began to adopt a new technique which entailed surface swimming to search for the prey that, on the approach of the swimmer, head for the bottom. The fisherman dives in pursuit to capture the fish by hook and net and then surfaces to transfer the catch to a tank in the attendant boat. The fish sought are usually wrasse and grouper weighing up to 10 kg each and highly prized by local gourmets. Freshness is an essential feature, and they are kept alive in restaurant fish tanks until cooked.

The best fishing areas are in the South China Sea up to two days' boat journey from Hong Kong. The diving equipment is a makeshift hookah type contraption with an air supply from a compressor in the boat. About 150 fishermen use the new technique and none has had any diving training or medical assessment. Up to 30 dives to depths varying from 30 to 45 metres may be made in a working day. The duration of each dive is usually from 10 to 30 minutes, but may extend to more than two hours. Decompression schedules are not followed during the ascent nor is it usual to make any stops. The time on the surface between dives may be minutes or hours, depending on the sighting of fish.

Case history

During one morning a 20 year old fisherman completed 10 dives including several down to about 37 metres, which is the bottom depth in that area. Most of the dives lasted 10 to 15 minutes but two lasted up to two hours at the lower depths. The ascent from each dive was direct, with no stop. He then made another dive following a fish down to about 37 metres. Some 25 minutes later he was still searching for the fish on the bottom when his air supply failed when the pipe became kinked. He immediately ditched his weights and surfaced in about 30 seconds when he swam to the attendant boat and climbed aboard. Soon afterwards he felt a sharp pain in both shoulders and a sensation of pins and needles in both upper arms and in the anterior chest wall and he was unable to raise his arms. The symptoms gradually subsided after about two hours but severe shoulder pain recurred a few hours later and again lasted for about two hours. This was followed by numbness of the deltoid and scapular regions and the lateral aspects of both arms down to the elbow, accompanied by dyspnoea and chest tightness on inspiration. These symptoms persisted with some fluctuation in severity. Attempts to relieve the symptoms by further diving resulted only in their aggravation.

On the fourteenth day after onset the fisherman discussed his condition with a professional diving instructor and was referred to the care of one of the authors (KPY) who was in medical charge of a compressed air work contract with medical lock facilities.

Clinical findings

At examination the patient gave his history as described and complained of continuing numbness of the upper chest and lateral aspects of the arms with chest tightness on inspiration. He was a well nourished muscular young man in good general

Treatment profile of a case of type 2 decompression sickness in a diving fisherman.

condition. Air entry appeared normal and equal in both lungs and there was no wheezing. Blood pressure was 130/80 mm Hg and the pulse rate was 72 per minute. Chest radiography and an electrocardiogram showed no abnormalities and x ray films of the major joints showed no evidence of osteonecrosis. Examination with a Doppler bubble detector could not detect intravascular bubbles in the precordial region. The condition was considered to be symptomatic of decompression illness with indications for recompression therapy.

Treatment

Treatment was given by recompression with oxygen in a medical lock that had an overboard oxygen dumping system. At 1.8 kg/cm² after five minutes the symptoms of numbness and chest tightness began to improve. After 10 minutes slight numbness remained over the left shoulder. Three periods of 20 minutes of hyperbaric oxygen at 1.8 kg/cm² separated by five minutes of air were given, by the end of which all the symptoms had disappeared. Decompression was then started first to 0.9 kg/cm² and then to atmospheric pressure, still breathing oxygen. The decompression profile is shown in the figure. The total duration of treatment was 160 minutes with oxygen breathing for 145 minutes. There was no recurrence of symptoms afterwards.

Comment

Although relatively mild this patient's illness was

suggestive of type 2 decompression sickness with the attacks of dyspnoea indicating pulmonary involvement and the paraesthesia at the chest and arm stemming from a neurological lesion. The response to recompression therapy supports this diagnosis. The case points to an occupational hazard from dysbarism associated with the new fishing practice.

The fishermen have no training in diving practices and no medical supervision, they use makeshift equipment, they do not follow any decompression schedule in ascent, and there are no facilities for recompression on the surface. Inquiries showed that about half the divers had experienced ill effects, including limb pains, dizziness, and dyspnoea. Those resolved without specific treatment, but the potential for more serious decompression effects is clear.

In addition to those concerned in the new form of dive fishing another local fishing community has been using a similar hookah airline method to collect shell fish from the bottom for many years. Their equipment is also primitive and little attention is paid to safe practice, although some education has been given to this group by an interested doctor. One case of severe dysbarism occurred in 1979 which responded to therapeutic recompression some 48 hours after onset but the patient was left with some residual neurological damage.

With little formal education and less capital local fishing communities are none the less independent and determined to wrest a living from the sea by using their own methods without interference. Against such a background the problems of ensuring diving discipline and an improvement in the present practices and equipment are formidable. Although local legislation specifies standards for compressed air working, professional diving activities are not covered. Even if diving was strictly controlled and the controls enforceable outside territorial waters, the results could well be a serious interference with livelihood. Any hope for preventing decompression illness lies in educating those at risk in the dangers of their work.

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