

who have required recompression therapy from the Royal Australian Navy School of Underwater Medicine.

Comparing the results of these groups and correlating the findings with the degree and type of diving exposure, should allow us to draw conclusions about the possible relationship of diving with dementia.

MORE ON THE SPONGE DIVERS OF KALYMNOS

John Hayman

Kalymnos is a small island measuring approximately 30 km by 15 km in the eastern Aegean, very close to the shore of Turkey. Is roughly comma shaped, the comma being inverted and very mountainous and barren. The only commerce that exists, exists because of the excellent port facilities which are available on the island. There is very little agriculture apart from a few citrus trees; most of the place consists of rock. The population is about 15,000 of which 14,000 are in the port of Kalymnos, which is in the south side of the island.

The island is very close to the island of Kos, which is quite famous because of its association with Hippocrates. You can get to Kos very easily, it has an international airport and there are regular flights from Athens, as well as international flights from various places in Europe. From Kos you travel to Kalymnos by ferry and there are two or three ferries each day as well as other ferries which travel to other islands in the Aegean.

Kalymnos is the home of sponges and these sponges are sold throughout Greece. They are sold throughout the world and virtually every natural sponge that is sold has made its way through Kalymnos. Sponges have a long history and have been part of human civilisation for many centuries. They were used in Roman times as padding for armour and even before Roman times they were used as contraceptive devices. They certainly are a very versatile material. The Kalymnians have gathered sponges for centuries. Originally they collected sponges from boats where they could hook them directly from the water. They could look through glass and with a long boat hook, pull them in. As time went on the sponges became less numerous and they had to go deeper and further afield. Nowadays, the sponge fleet does most of its sponge gathering off the coast of Libya. There are several small fleets which operate from the harbour and they are not all away at the same time. The sponge season lasts about 6 months and during that time, the five or six fleets are away for about 3 months at a time, some coming back and then going out again, and some staying away for the whole six month period.

Near the harbour there is a small sponge factory close to the church. The sponges are laid out on the wharf to dry. The harbour is also used for fishing and most of the boats there when we were there were fishing boats. Most of the sponge

gatherers were at sea and only the veterans remained. There is a rather stylised statue of a diver in the square immediately adjacent to the harbour. Most of the population live in that tiny portion of the island and most of the population, if they are not looking after the tourists, are concerned with the sponge trade or the fishing trade.

As well as the main port of Kalymnos, there is a smaller port around on the eastern side, called Vathis. This is a very much smaller port, with very clear water, suitable for diving but there are no air filling facilities on the island. You can snorkel with some success in the little estuary there. There are the remains of an Italian merchant vessel which was sunk by the RAF at the opening stage of WWII.

On the other side of the island, on the western side, there is the island of Telentos. It consists of a large rocky pinnacle with the little town at the bottom. Telentos is separated from the small settlement of Massouri on the west coast of the main island by the narrow straits of Telentos. It is reputed that there is the sunken city of Telentos in the channel between the two islands. It is quite a deep channel, I had a look for the sunken city without success. My efforts were rather derided by the locals in Telentos. I was assured it does exist. There is a little ferry which goes between the two islands, it shuttles backwards and forwards about once every 20 minutes and the fare is \$1.00. The small village of Telentos is very attractive. As well as the main village, there are the ruins of other settlements on the island which date back before Roman times. Many of these settlements are still used by shepherds and other people. You can see on the waterfront Roman ruins going down into the water. It is believed that this channel formed around about 2,000 years ago when the land sank and the original city of Telentos was flooded. Telentos has its own fishing fleet as well as a sponge gathering fleet which was at sea when we were there.

Most of the residual adult male inhabitants of Telentos were severely affected by decompression sickness in one shape or form. At least two older people both had the sequelae of severe decompression sickness. One man was beating a squid using his left hand. He was paraplegic and as well he had a fixed flexion deformity of his right hand. Still photographs do not depict the disability of these people very well. It is when they try to walk that you appreciate just how severely handicapped they are. One retired diver who still goes fishing, can only walk with the greatest of difficulty. He has a fixed extensor spasm in both legs. It would be ideal to have a movie camera to show how these people do get around. They are very affable, very kindly, friendly people who certainly do not mind being photographed or showing their disabilities.

When we were there, there was only one restaurant and hotel open at the time and we were the only people staying at the place. It was a combined "guest house and restaurant with a liquor licence". The proprietor is a man in his 40s who was severely afflicted by the bends when he was aged 17. Now he has severe spastic paraparesis and in addition he has a gross arthritic deformity of both knees. He was quite happy to let me examine him, but as you know, by trade I am a pathologist and not a neurologist. The deformity was such that you would find in a Charcot's joint. There was

gross arthritic deformity and yet no pain, and he seemed to lack any position sense as far as his toe or foot was concerned. I concluded that he had not only motor paralysis but also dorsal column loss. His condition had been virtually unchanged since the age of 17. There is no opportunity for remedial therapy or any form of surgery available in the islands.

The island of Kalymnos now not only processes its own sponges but takes sponges from Cuba and the Caribbean and is the main centre for processing sponges throughout the world. The sponges are soaked in hydroxide and potassium permanganate solutions. I do not pretend to understand what happens, but the process involves getting rid of the organic matter which is present and leaving only the clean fibre. The sponges, as well as being cleaned, are trimmed to various sizes. The final trimming is using a pair of sheep shears. Finally the sponges are sorted according to different types. It is the large, round sponges that are very valuable and these are now found at the greatest depth. The sponge divers in fact, work for long hours, perhaps up to six hours a day. The deeper they dive, the better the sponges, so there is an incentive for them to dive deeper and stay there longer with the results that we have seen. Many of the sponge factories, there would be about 10 in the main city, have various mementoes of the past, including old type of diving helmet which they used. They are probably relics from the French or British Navies. There are also relics from even earlier times and they are strewn around with some disdain. They are used as doorstops in the houses although quite clearly they are tile genuine article.

The sponge boats are all brightly coloured, are very attractive vessels, but no bigger than the boats we have been on board today. The compressor is usually in the hold of the ship and is driven by the main engine in the boat. It does not have a separate engine. The air intake is in the hold also. There is no separate air intake in the bow of the boat. There is an accumulator on top of the cabin, usually with two hoses for the divers. The arrangements for the divers seem to be extraordinarily primitive. Most of the masks look to be old gas masks that have been cut down to size. It is joined to a length of garden hose, with the hose attached to a length of copper pipe and then to a mouthpiece by rope. On the other side of the breathing apparatus there is a piece of soft rubber, perhaps a piece of old bicycle hose, which seems to act as a valve so that any excess air gets blown off. The garden hose is tied to the belt and then passes on to the mask itself. These may have two divers working from the one compressor down at the same time. As they are both relying on the one air supply, admittedly there is an accumulator, their chances of being able to help one another if the compressor broke down would be fairly remote. They dive using this type of apparatus to depths of about 120 to 140 ft. I was told by one person that they went down to 200 ft but I find that hard to believe. They dive for up to 6 to 8 hours per day. They dive for weeks on end.

The island itself has some 16 doctors, one of whom describes himself as a pathologist, but I think he is in fact a general practitioner who does tests in a side laboratory. There is a recompression chamber of some sort in the local

hospital. But as these boats are working off the coast of Libya and there are no facilities of the coast of Libya that they are aware of, the recompression chamber on the island of Kalymnos is not of much value to them.

I saw a diver using the apparatus, cleaning and painting a boat in the harbour. It worked with the excess air being bypassed and he just took air as he needed it. There is a basket that goes down with the diver. He puts the sponges in this and it is drawn up to the surface while the diver himself stays at depth.

On the island of Kalymnos there is a cross erected to the memory of those who have lost their lives at sea. On average (this information came from the pathologist on the main island) they lose two or three divers each year, and up to 10% of the divers suffer some disability each year from diving. It seems a tremendous mortality and morbidity, but when you look at the type of equipment they use, you can see that the possibilities for disaster are considerable. Not only do they suffer the possibility of barotrauma from coming up quickly and the bends for staying down at such depths for such lengths of time, but the equipment seems very primitive and liable to failure. With that type of breathing apparatus they could develop carbon dioxide retention as well as carbon monoxide poisoning from the fumes in the hold.

DISCUSSION

Question:

Do you have any idea why the equipment has not been updated. After all this is not a very poor community. Is it just a slavish adherence to tradition or is there some specific reason why new technology has not been introduced?

Dr John Hayman

I really do not know. I think that it is a very traditional community. I think that the art as it is has been handed down from father to son, but I think things are now being improved. Some divers go to Marseilles for training at the school there and I know there is a team that comes out from the Massachusetts Institute of Technology once a year to survey the divers to see what has happened. However I do not think they have actually improved their techniques to any great extent. It is surprising and I was horrified to see the type of equipment that was used. But the island itself is very primitive in many regards. There is no scuba gear available anywhere in the Greek Islands apart from Rhodes. This is their only industry. The only thing they can do for a living is to go and gather sponges and the only place to get them is to go diving off the coast of Libya. My only regret is that there have been no post mortems. It is really a pathological paradise with all those cripples walking around the place. Unfortunately, they are very reluctant to have post mortems. A very large number of Kalymnians have migrated to Australia and most of them are living up in Darwin. I am hopeful that some of the ex-divers may also be there, and I may be able to collect some pathological material in Australia. Apparently the Kalymnians are doing very well in Darwin. They own most of real estate and the real estate agencies as well as the fish and chip shops.

THE BANDOS NIGHT DIVE

The Greek sponge beds have been fished out entirely and it is only the very poor quality sponges now that are found around Kalymnos itself. If it was left entirely to Nature I do not know how long it would take for the sponges to come back. But one problem with the Mediterranean now is that it is so polluted. There is so much oil and rubbish floating around that you just wonder whether the sponges would survive anyhow.

Question:

Could the man with the Charcot's joints have had syphilis?

Dr John Hayman

There is no need to invoke syphilis to explain the man's Charcot's joints. All one needs to develop Charcot's joints is lack of pain sensation.

There was a pathologist on the island and he did do tests, but whether he was actually tested for syphilis I do not know. I do not think the joints were syphilitic. I cannot produce any evidence, but it is a fairly traditional community and they are not normal seafarers in that regard.

He had a definite sensory loss which could best be explained by spinal cord decompression sickness. He had horrible knees. As I moved them up and down they made a terrible crunching noise which you could have heard from 3 or 4 feet away. But it did not bother him at all. He certainly had loss of position sense in his foot. A lot of the disability would be due to secondary osteo-arthritis.

It really needs a team to go in and assess these people, not only a neurologist but also a radiologist. It really is a goldmine of diving related pathology.

'Twas on the stroke of eight o'clock
In those islands of the moon
When Herwarth shouted "Tally Ho"
And not a bit too soon.

For sixty men and women bold
Each donned their BCD
Then, like a pack of lemmings
Marched, backward, through the sea.

Atop the dropoff, thumbs went down
Vent hoses were held high
When all at once rude torch lights
Pierced the evening sky.

So now the party has begun
And chaos was to reign
As drunken glowworms wandered
'Cross the undersea terrain

Like search lights in an air raid
Spotting bombers in the blue
The waters of the Bandos reef
Resembled World War II.

Corals crashed, fishes fled
Crayfish ceased to creep
Even fearless reef shark
Retreated to the deep.

No one knows what havoc
Took place beneath the foam
But sixty minutes later
The raiders left for home.

As years go by and divers
Hang up their fins and masks
They'll still remember '85
And SPUMS night diving farce.

PROVISIONAL REPORT ON DIVING-RELATED FATALITIES IN AUSTRALIAN WATERS, 1984

Douglas Walker

SUMMARY

There were four breath-hold diving fatalities identified in 1984, twelve scuba divers and one hookah diver. Two of the incidents resulted in double fatalities, though in one of these a higher toll was only averted through the skill of those involved and their avoidance of panic under extremely adverse conditions. Of particular interest is the fact that two of the victims were found to have an asthma type problem which was apparently quite unsuspected by their fellow divers, however examination of the events shows that the outcome could well have been the same even in the absence of such a factor. Cardiac problems were almost certainly critical in several cases. The occurrence of the fatal dis-

secting aneurism of the ascending aorta (Case SC 84/7) was an example of an undetected/undetachable fatal situation presenting during a carefully conducted dive, a tragic event occurring during a dive but almost certain to have occurred however quiet a life style he had followed. Case SC 84/11 may be usefully treated as the basis for a discussion of the responsibilities devolving on anyone who organises a dive, particularly if they hold instructor status, and the importance of buddy diving procedures, using a J-valve rather than a contents gauge, the value of buoyancy vests, and whether boats should be left empty while divers are below. These are all matters of significance when the diver runs into trouble.