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day? Pyrimethamine and sulphadoxine are plasmodistatic drugs as opposed to the plasmodicidal drugs like chloroquine, quinine and amodiaquine. So, first of all, we have knocked down the parasites to a very low level by using plasmodicidal drugs and we only have a very few parasites remaining. These can then be mopped up, so to speak, by the slow acting Fansidar which also remains in the blood for some period of time having a half-life of approximately one week. This is the simple treatment of uncomplicated chloroquine resistant falciparum malaria.

If the person has an R2 or R3 resistant strain, then one would use quinine in the first instance. Quinine is a very old and well tried drug. It is very rapidly absorbed and it is plasmodicidal in its action and reduces the parasitemia very quickly, so that within 24 hours the parasites come down from the order of say, 100,000 per cu mm to about 1,000 per cu mm, then further down so that by the third day most of them have disappeared and are ready to be mopped up by the Fansidar. Quinine alone could be used, but if used alone, it would take 7 days of treatment. I do not know whether any of you have taken quinine but, after the third day, when you feel as though a railway train is rushing around in your head and there are bells ringing all over the place, you are having hallucinations and sweating like blazes and thinking it is worse than the malaria attack you have just had you do not feel like taking any more quinine. Therefore, quinine therapy should be supervised to ensure the drug is taken and dosage reduced where necessary to relieve these untoward side effects of the drug.

So much for the treatment of the uncomplicated case. The complicated cases are much more difficult to treat and would require a separate talk.

Malaria chemoprophylaxis. What should one do when going to an area where there is malaria? The first thing is to find out whether there is any chloroquine resistant falciparum malaria and find out which drugs are effective in prophylaxis. The second thing to do on arrival in the area is to remember hat the anopheles mosquitoes have a predilection for biting at night. They bite around the ankles mostly and if one is covered around the ankles they tend to try and bit further up but not so frequently. They also tend to stay around the rural areas and not so much in the urban areas so one will not find too many around the Mendana Hotel. If you stray into the bush at night, you might find some anopheles mosquitoes biting. The female anopheles is the one that bites because she is the only one that sucks blood. The male does not suck blood at all, so it is only the female that transmits malaria.

How do you protect yourself?. You should wear long trousers and socks and long sleeves. If you do not do that, I suggest that you use a repellent. These are the first principles of protecting yourself from mosquito bites. You should also sleep in screened quarters at night or under a net and if you do that, in most cases, you will be lucky enough not to be bitten by an infective mosquito. In addition to that, in areas where malaria is highly prevalent and where it is transmitted constantly throughout the year, it is wise to take some sort of chemoprophylaxis. Some people do not but they are tempting fate and I have treated too many of them and brought them back from death's doorstep to know that they should be taking chemoprophylaxis.

What does one take? Here in the Solomon Islands the parasite is still very sensitive to the very simple antimalarial proguanil, which is the least toxic of all the antimalarials and does not cause many side effects and certainly does not cause any nasty ones. Pyrimethamine cannot be used because there are pyrimethamine resistant strains which are highly resistant. Chloroquine, despite the fact there are chloroquine resistant parasites here, can still be used and it is very effective. Amodiaquine can also be used and belongs to the same chemical group as chloroquine, the 4-aminoquinolines, and is just as effective. Third line drugs will be discussed later. Proguanil has to be taken daily. For people who cannot remember to take daily tablets, it is pointless giving proguanil because it is excreted very rapidly and the blood levels would fall too rapidly to ensure protection. Chloroquine is taken weekly. Fansidar, a third line drug, is to be used only in treatment of chloroquine resistant strains in combination with chloroquine or quinine since it is plasmodistatic and, because of its mode of action, resistance develops very rapidly. As it is our only line of treatment for the drug resistant cases at the moment, we like to keep it in reserve for that purpose.

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CEREBRAL ARTERIAL GAS EMBOLISM OR CARBON MONOXIDE POISONING A CASE REPORT

John McKee

This is a case report about a 32 year-old diver, a Victorian who visits the south coast of New South Wales periodically for sports diving activities. He has had 7 years experience on hookah and on scuba equipment. Last year he was having another sporting dive off the far south coast of New South Wales.

On the day of his "accident" we have no idea of the profile of his first dive. We believe it was probably not more than 30 or 40 feet as he was diving on hookah equipment. We know the second dive profile and that was also using hookah, a dive to 20 feet for approximately 5 minutes when he was struggling with and trying to loosen an anchor

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which was caught on the bottom. He succeeded in doing this and was then observed to ascend rapidly. On reaching the surface complained of feeling nauseated. He was helped aboard the boat, his nausea was then worse but he attributed this to sea sickness. Within a further 2 or 3 minutes he collapsed on the dive boat. The description we have from his buddies was that he soon went unconscious. He was unable to speak. He was unable to open his eyes and one buddy described him as going rigid in the back. The buddies said that he was "unconscious" for perhaps 90 minutes. When he was brought to shore he was subsequently transferred by air ambulance to the Prince Henry Hospital Hyperbaric Unit in Sydney. I expected that he would have been transferred to Morwell as he came from Bairnsdale. He arrived in Sydney within approximately 4 hours of the diving accident, not pressurised, and when admitted to the hyperbaric unit he was fully conscious, it was noted that he was not speaking correctly and he used incorrect words. His mental processes seemed to be somewhat slow, his blood pressure was 180/120 initially but after resting for 20 minutes this fell to 150/80. A chest x-ray was done and this revealed no abnormality. He was immediately put into the hyperbaric chamber on oxygen.

In the meantime a full blood count and electrolytes were normal. The most interesting thing in the first blood test, which became available while he was still in the chamber, was the fact that his carboxyhaemoglobin was 20%. He was treated on the usual tables and by the following day his carboxyhaemoglobin had returned to normal. His CT scan showed a diffuse mild cerebral oedema but no other abnormality and an EEG showed some mild abnormalities on the left side with hyperventilation.

His treatment involved after the hyperbaric treatment, 2 days in bed and he was then mobilized. On the fourth day, after being examined by a neurologist, he was permitted to leave hospital.

I think it is worthwhile pointing out that carbon monoxide is toxic, it is odourless and it is tasteless. The greatest problem with it is its affinity to combine with haemoglobin, 200 times greater affinity than oxygen, to form carboxyhaemoglobin. Carboxyhaemoglobin displaces oxygen and hence if sufficient combination occurs hypoxia will result. The hypoxia produces symptoms. Probably some symptoms occur as a result of a direct toxic effect on the cell.

The interesting thing in the treatment of this patient was the fact that he, perhaps accidentally, received the correct treatment by having hyperbaric oxygen. The amount of oxygen in solution was increased so that the supply of oxygen to the cells and tissues was increased and the haemoglobin system was more or less bypassed. At the same time of course the oxygen encouraged the more rapid diffusion of carbon monoxide. As you know the correct treatment for most cases for carbon monoxide poisoning is hyperbaric oxygen.

In summary then, this was a sports diver who had two dives, one and somehow or other his hookah intake was contaminated with carbon monoxide from the compressor. Presumably he had some symptoms at the end of the first dive and they became much more pronounced on the second dive. I would have thought that if he had a carboxyhaemoglobin of 20% at least four to six hours after emerging from the sea, the level at the time when he came to the deck may well have been 50%. At 14%, divers may have headache, dizziness and some breathlessness on exertion. At 30% they usually become confused and supposedly at 60% they become unconscious. This patient maintains, during the 90 minutes that his buddies thought he was unconscious, that he was not unconscious but he admitted there was no way he could open his eyes and there was no way he could speak.

So the suspected cerebral arterial gas embolism due to pulmonary barotrauma after struggling with the anchor and a rapid ascent turned out to be a case of carbon monoxide poisoning.

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CLAM MARICULTURE

David Davies

Introduction

For thousands of years, the seven species of Tridacnid bivalves or giant clam, prevalent in the Pacific, have played an important role in the diet, folklore and mythology of the Pacific Islanders. In some areas a traditional form of farming of the clams has occurred on the fringing reefs but, despite this, over harvesting has resulted in depletion of stocks and even in local extinction. During recent decades, massive commercial exploitation, mainly for the Asian market, has resulted in wide spread depletion of natural stocks in many areas and total extinction of the species in other areas.

Tridacnid harvesting for the Asian market is extremely wasteful as the fishermen have been taking only the adductor muscle. The shell, mantle and entrails are discarded despite the fact that all the flesh, apart from the kidney is quite edible. The Chinese tend to prefer the meat in the dried form whereas the Japanese prefer to use the raw form for sushi and sashimi.

Until stringent regulations were introduced and enforced by both the Australian and Taiwanese Governments, both