

or runner. So we do not have to try and train the sport diver to run twelve miles a day, or to swim three miles a day.

We would like to generate a moderate programme of exercise which can train that sport diver to be able to handle the stresses that he will experience in diving. We are aiming to make a person fit enough to dive. He does not have to become an expert athlete.

A study was done by NASA. They put trained and sedentary people to bed, which degraded their performance, then gave them all a training programme. The trained persons went back to their previous performance while the sedentary improved on theirs but not up to the level of the trained group. The trained persons had more or less achieved what they could achieve from training. So if you de-train them and then re-train them they will go back to where they were. The maximum oxygen consumption can not be improved ad infinitum in the fully trained person. In other words there is a limit to what you can gain from training. The trained individuals when de-trained and re-trained got back to what they could achieve before. The untrained or average individuals improved beyond their previous condition but not to the same level. This was interpreted as saying that the individuals who were in average condition were not able to improve to the point that the other individuals had reached. In other words there was an inherent difference or inborn difference between the different individuals. It is also possible that the sedentary individuals, if they had had a longer training programme, could have achieved more.

If you give everyone the same training programme, you are going to have individuals who come out with a much higher maximum oxygen consumption because they have got some inbuilt advantage, which we do not clearly understand. There will be some people who train and end up with a higher maximum oxygen consumption and better aerobics than other persons who are given the same training programme.

What I am saying is that there are inherited differences among individuals, and if you give everyone the same training programme, you are going to have a spectrum of responses.

Question: Bob Halstead

I want to comment from the instructor's point of view. I find that the very fittest people on diving courses tend to be the worst divers at the end of the course. The reason is that they tend to have inappropriate behaviour in the water, deliberately swimming against the current and so on. This would appear to be a psychological attitude that they are fit and can do anything. Whereas the less fit person behaves in a different fashion.

Dr Fred Bove

Fitness means different things. I see people who say that they are fit. A twenty-five year old who has been working

at weight lifting is all solid muscle, and he says that he is fit. That person is really not fit for diving. He needs endurance rather than strong musculature. If somebody says they are fit, and they have arms the size of your thighs, that person is not really fit for diving, that person is trained the wrong way for diving. It is not going to help him at all, in fact it is going to give him trouble. The other extreme is the long distance runner who says "I can do anything because I run fifty miles a day". You are then going to run into the same problem. That person may only weigh 110 lbs and when you put the tank on his back he falls down and can not get up again. His arms are about the size of your little finger. They are the two extremes. I think that the two extremes are not fit for diving. What we are trying to do is to get the average person, who is not trained at all, not physically conditioned at all, to get into some degree of physical condition so that he can handle the normal exercise that is needed for diving. At the same time you have got to get his mind into the right shape too. Physical condition is one thing, train him for that, but also train him to not overestimate his capacities, because they are different. We should train both the body and the mind at the same time, as they are two different things.

TWO CASES OF NECROTISING FASCITIS

Peter McCartney

Mr TW was a 58 year old plant operator at a paper mill who had had no previous ill health other than five years of occasional arthritis.

History

Rigors and 'flu for eight days. Constipation for seven days. Jaundice and dark urine with pain and swelling in both buttocks for five days.

Three days previously admitted to New Norfolk Hospital as ? hepatitis and treated with IM penicillin 1.5 mega units BD.

Admission Findings

Septicaemic (38⁵) dehydrated, jaundiced, tender hepatomegaly, massive induration of both buttocks.

Investigations

| | |
|---------------------|--------------|
| WCC 33,000 |) |
| Bilirubin |) |
| Urea and creatinine |) raised x 3 |
| Al Phos 305 |) |

Ultra Sound = gall stones, ducts not dilated, therefore cholangitis unlikely to be cause of septicaemia.

Management

IV fluids, central venous pressure line catheterised, antibiotics - Gentamycin and metronidazole.

Day One

First Operation -
A wide excision and debridement of both ischio-rectal fossae. Little pus and no true abscess.

Day Two

Much improved, afebrile. Deterioration of renal function, creatinine levels rising to seven times normal. Moderate acidosis.

Cultures showed heavy mixed bacteroides fragilis, anaerobic strep. clostridium species and E Coli.

Day Three

Continued to improve. Small darkened area 0.5 cm noted on the scrotum.

Day Four

Area of obvious gangrene now 6 cm diameter. General deterioration.

Second Operation -
Extensive necrotic oedematous stringy tissue excised. Considerable blood loss associated with very radical excision. Dopamine infusion needed to maintain BP 100/60. WCC 83,000 - Not leukaemia.

Two hyperbaric (HBO) treatments given (BD for four or five days planned)

Third Operation -
Required to control bleeding by repacking wounds.

Day Five

Fourth Operation -
Further re-exploration and debridement.

Third hyperbaric treatment.

Day Six

Much improved. WCC 40,000. Creatinine now nine times normal but no longer climbing.

Fourth HBO treatment.

Fifth Operation -
In view of his improving prognosis a right transverse colostomy and minor debridement was carried out. Cardiorespiratory arrest occurred after this procedure. He was found to have a right upper lobe collapse.

The patient's condition precluded further HBO.

Colostomy bleeding, requiring transfusion, was probably secondary to minor diffuse intravascular coagulation. The diuretic phase of renal failure was starting.

Day Eight

Sixth Operation -
Minor debridement, but followed by heavy blood loss requiring transfusion

Day Ten

Haematemesis which was treated conservatively with twelve units of whole blood. Endoscopy was not helpful. He had had a total of 46 units at this time.

Day Twelve

Seventh Operation -
A rebleed forced this surgery. At gastroscopy multiple superficial ulcers mainly in the gastric fundus were seen. A truncal vagotomy and pyloroplasty was performed. He was ventilated post-op and commenced on total parenteral nutrition.

Day Nineteen

A rebleed which was managed conservatively with the transfusion of sixteen units fresh frozen plasma and platelets. Cimetidine was added to his treatment. A dramatic result followed bicarbonate infusion. The gastric pH rose to ten measured via a nasogastric tube.

Day Twenty-One

He developed a progressive metabolic acidosis related to his renal failure and TPN.

Day Thirty

He appeared terminal. TPN was stopped. pH was corrected with massive transfusion of bicarbonate.

Day Thirty-One

Started improving in spite of everything.

Day Fifty

The problems persisting at convalescence were;

- (a) weight loss from 107 kg to 70 kg
- (b) malnutrition
- (c) poor appetite and vomiting
- (d) apathy and withdrawal
- (e) muscle weakness

Day Fifty-Two

By now there had been a remarkable healing of the perineum and scrotum. Thin split skin grafts were laid over the area. He was discharged to continue convalescence at New

Norfolk eleven weeks after his admission. His colostomy closed at a later date with completely satisfactory anal function.

Mr MT was a 58 year old gardener.

History

A fourteen day illness with abdominal pain, diarrhoea. For three days an E Coli urinary tract infection. He had been treated with erythromycin and tetracyclines.

Admission Findings

Septicaemic, distended tender abdomen, creptins over right iliac fossa. Scrotum and perineum oedematous and indurated.

Investigations

WCC 23,000

Normal Glucose and renal function

X-ray of the abdomen showed gas in the tissues of the right flank

Management

IV fluids, antibiotics

Day One

Operation

An extensive right ischiorectal lesion was found and widely excised. The abdomen was explored and showed necrotic muscle and fascia, from the perineum, over the abdomen to the lower right ribs. Relieving incisions only were performed.

Cultures from the wounds grew heavy mixed growth of E Coli. Bacteroides fragilis and anaerobic strep. Postoperatively he was continued on antibiotics, penicillin, Gentamycin and metronidazole. IV fluids and Cimetidine were given.

Day One to Four

Twice daily HBO treatments given to a total of six treatments.

Day Four

He was greatly improved being afebrile with a normal WCC. His treatment was continued.

Second Operation

Closure of the defect with Teflon mesh. Postoperatively HBO was resumed and a TPN commenced as well as oral feeding through a nasogastric tube.

Days Six to Ten

Seven further HBO treatments

Day Twenty-Eight

Split skin grafts applied to the teflon mesh which had become filled with granulation tissue. The perineal wound left to granulate with success.

Colostomy closed at a later date with completely satisfactory anal function.

CASE REPORTS

John McKee

I am a general surgeon in Bega on the far south coast of New South Wales and while the amateur divers do not bother me very often, quite a few times over the years I have been asked to give assistance in the treatment of abalone divers who have run into problems. There are forty abalone divers in my area and from time to time they get into real or imagined problems. This year I have dealt with two cases of possible decompression sickness.

The first was a 28 year old abalone diver. He had the usual story of severe pain in one shoulder and arm. He had been diving for seven years. He used decompression stops very rarely. He hardly ever used a depth gauge. He said that he spent the last half hour or so in shallower water than earlier in the day. That can mean anything.

On the day in question he had done three dives. The first to 90 feet for 45 minutes. He then came up and emptied his abalone shells into the boat. After a surface interval of five minutes he dived to 90 feet for 90 minutes. He then came up to the surface again and unloaded his bag. This time he extended his surface interval to 10 minutes before he went down to 60 feet for 30 minutes. When coming up, before he reached the surface, he experienced severe pain in his left arm and shoulder. When he arrived at the hospital I estimated that he had a limb bend of moderate severity. We gave him oxygen to breathe all night. At this stage I was contemplating whether or not to try to send him by helicopter to Sydney. His general condition was quite satisfactory. He had no other evidence of decompression sickness. By the next morning his pain was a lot better, so he was kept on oxygen for another 24 hours and the pain completely resolved. The X-rays of both shoulders showed no abnormality.

The second case was 10 years older and perhaps a little wiser. He had dived for quite a few years as an abalone diver. He also was brought to the hospital at night with suspected decompression sickness. He gave a history of repeated dives to no more than 70 feet that day. The first dive was to 70 feet for at least 90 minutes and the subsequent six to eight dives were at shallower depths but for similar lengths of time. When coming back to shore he felt discomfort in both legs, a feeling of numbness. By the time