Conference Report

Medical lessons from the Falklands

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Whether you regard the battle for the Falkland Islands as a victorious fight for right or a folly of mammoth proportions is your own affair. Nevertheless, it would be churlish to deny the armed services credit for conducting a successful campaign under extremely difficult circumstances. Just how difficult becomes apparent on reflection that those remote outposts of our erstwhile empire lie some 8000 miles away. The logistics of conducting "Operation Corporate" to reclaim the occupied islands were therefore complex and compounded by the problem that it was impossible to know exactly what measures would be necessary to achieve this objective. A disbelieving world saw last ditch diplomacy fail, but it was still hard to foresee the scale of the Argentine resistance. Our forces, and among them the medical teams, had to be capable of meeting an unpredictable challenge. In the event the number of casualties was thankfully less than anticipated (255 of the task force were killed and 777 wounded), and the medical care provided was of a high calibre.

A two day meeting organised by the United Service section of the Royal Society of Medicine reviewed the medical aspects of the crisis. The meeting was held at the Royal College of Surgeons, and an impressive number of doctors from the services, and those who had seen active service in previous wars, were in attendance. Most of the speakers had taken an active role in the conflict, and collectively their short papers gave a vivid impression of the medical problems. In a few there was also a glimpse of the psychological trauma which such an experience can engender. If at times the meeting hit a justifiably self congratulatory note, it was toned down by an attempt to consider what medical lessons could be learnt from the conflict.

Time spent in planning

Perhaps the first lesson is that time spent on thorough planning is time well spent. Good planning and efficient organisation were particularly important in view of the distance, with the nearest air base at Ascension Island still 3800 miles from the Falklands. Medical supplies had to be planned to last for the duration of the campaign, and in practice they did. The only points to emerge were that the labelling of stores could have been clearer and that multipurpose packs may be more useful than boxes full of one article. Many stores were supplied to excess, including vast numbers of antimotion sickness tablets and—less obviously—Anusol suppositories. In antici-

pation of the predictable effect of a lack of dietary fibre the British stocks of the latter were soon exhausted, only to be discarded as constipation responded to All-Bran or the imminent threat of personal danger. Brigadier A J Shaw at the Medical Defence Depot told us that about £1.5 million was spent on medical stores and equipment, a sum that pales into insignificance when the cost of the military hardware is considered.

A lesson that civilian administrators might do well to learn is that once decisions have been made there is a lot to be said for prompt action. It is salutary to remember that *SS Uganda* was converted from a merchant cruiser carrying school parties to a hospital ship complete with intensive care unit, casualty department, operating theatre, laboratory, x ray department, and desalination plant within 60 hours. The flagship *Canberra* was similarly converted, although her prime designation was that of a troopship. Flexibility was seen as another key attribute for success. Operation Corporate was first conceived as a maritime one; hence the first medical objective was to provide a "hospital at sea," which took the form of *Uganda* and *Canberra*. It soon became clear that there was a need for a comprehensive land based medical service, and the army mobilised the necessary equipment and personnel to create field service hospitals and regimental first aid posts. These were realised in the form of the medical bases at Ajax Bay, Fitzroy, and Teal inlet.

The route for evacuation of casualties was minutely planned in advance. At sea the chain was envisaged as follows: injured—helicopter—hospital ferries—*Uganda* or *Canberra*. On land the chain was injured—regimental first aid post—helicopter—field hospital or hospital ship. Uruguay was the nearest friendly country to offer support, so onward evacuation was to Montevideo by sea and then on to England by VC10. The delay in shifting casualties from an inhospitable terrain with no roads was anticipated and forward medical support planned. This took the form of special combat medical teams who were trained to put up drips, apply splints and dressings, and give intramuscular analgesics and antibiotics in the field. There was to be heavy reliance on the skill of the helicopter pilots, a skill that was unquestionably realised.

Triage

Triage was a word much bandied about during the conference and essentially means the application of good casualty officer common sense in defining priorities. As in the second world war, casualties were to be categorised by triage officers into those for immediate resuscitation, those in need of early surgery, and those who could wait. This is obviously an essential policy in the face of multiple casualties where the surgical teams are working flat out and the "let's consider what to do next over tea in sister's office" approach is not appropriate.

The voyage out provided the troops with more than an opportunity to find their sea legs. Intensive physical and combat training was carried out, and the medical officers seized the opportunity to hit home the principles of first aid to all the men and polished up the routines of the medical teams. I was interested to hear that in some regiments the men (not only officers and non-commissioned officers) carried syringes containing papaveretum and knew how to give it intramuscularly through clothing. To introduce a further note of realism, some medical officers had shown slides of casualties from other conflicts to prepare the men for the full horrors of modern warfare and to explain how casualties would be treated. This "acclimatisation" paid off and reinforced the troops' confidence in their medical support. Many merchant seamen and some civilians were concerned in the conflict, and their help proved invaluable, not least as surrogate nursing auxiliaries.

And so to action: 4 May saw *Sheffield* hit by an Exocet missile. The ship was rocked with explosions and filled with thick black smoke and fire. The deck became unbearably hot and the order to abandon ship came four hours later. Then *Antelope*, *Coventry*, and *Atlantic Conveyor* fell victim to

Exocet attacks, and their medical officers described their individual experiences. Only Surgeon Lieutenant G J Brooks gave vent to his emotions and portrayed the full horror of burning decks, cries of trapped victims, and a precipitate rush into the icy cold sea as *Atlantic Conveyor* was abandoned. He ended, however, on a practical point: that there should have been some form of hoist to get the injured down from the side of the ship into the life rafts.

Battle at sea

The battle at sea claimed over 35 lives and there were many casualties. Of the latter, one third were burns—in the campaign overall burns accounted for 14% of all the injuries. The comparable figure in the second world war was 1.5%. Few new lessons were learnt, but old ones were put fully into practice. Firstly, if possible, the victim was hosed down with cold water and then given intramuscular analgesia. When necessary colloid loss was replaced with dextran 70 at a rate adjusted to get the packed cell volume down to and maintained at 0.4–0.5. The burns unit in *Uganda* was designed to maintain a constant temperature (much warmer than elsewhere) and humidity. Closed dressings were applied after the application of 1% silver sulphadiazine cream, and skin grafting was carried out at about three weeks. Second line treatment was based on early mobilisation, early grafting and tarsorrhaphy to prevent corneal damage, and active measures to counteract flexion contractures. Further treatment was given to 47 severe cases in the military hospital at Woolwich, and photographs of the clawed hands and disfiguring facial burns made for harrowing viewing. As Colonel B C McDermott pointed out, the stamina of an individual may be the rate limiting factor when it may be necessary to carry out up to 30 operations over two years to achieve an acceptable cosmetic and functional result.

Inhalation of smoke on board the burning ships was a common problem, but there was no reported case of pulmonary oedema or shock lung. Once again this problem had been anticipated, and all casualties who had been exposed to smoke were given an urgent intravenous injection of 2 mg methylprednisolone. Typical symptoms of smoke inhalation included conjunctival irritation, shortness of breath, retrosternal pain, and the expectoration of bloodstained sputum. Telltale signs on examination included singed nostril hair, oedema of the uvula, and coarse crackles and wheezes in the chest.

The experience on land was very different, and again old problems reared their heads: shrapnel and gunshot wounds, trench foot, and non-freezing cold injury. The conditions on the Falklands could hardly have been worse, with rough rocky terrain, bogs, and no roads. The temperature ranged from -3° to $+4^{\circ}\text{C}$ and with heavy back packs the troops took up to four hours to travel one mile. It was hard to keep warm and impossible to stay dry. There were 70 cases of severe cold injury affecting the feet, a condition characterised by damage to the peripheral nerves and vasculature. The subject complains of numbness, paraesthesiae, and then loss of sensation that takes weeks to recover. The feet often become severely swollen and painful. This was a common and disabling problem, and it was encouraging to hear from Surgeon Commander F St C Colder that research is being carried out to try to establish the clinical course of this condition and methods to try to prevent its occurrence. Possibly it occurs in people who have abnormal peripheral vasculature to start with.

Most of the surgery on land was carried out at Ajax Bay, where two army and two navy surgical teams worked side by side in an old refrigerator plant. The lighting was inadequate and there was no sterile water, no autoclave, no diathermy machine, and a limited supply of linen. Gloves were worn but often not changed from one operation to the next. In four weeks 725 patients were treated (40% of them were Argentine casualties). In retrospect, undoubtedly lighting could have been improved and a diathermy machine provided, but once again

the success of the surgical teams was due to the application of lessons learnt in earlier wars. Wounds were explored, debrided, and left open for five to six days before delayed primary suture. Tetanus toxoid and prophylactic antibiotics were given routinely. Dynamic triage was applied successfully, and only two deaths were recorded. Some four fifths of the injuries were to the limbs, and once again coloured slides brought home the devastating effects of high velocity missiles.

In an exercise characterised by careful planning it should not have come as a surprise to hear that a mental health team headed by Surgeon Commander M R O'Connell was taken to the Falklands. Up to 15% of a combat force may become psychiatric casualties in adverse circumstances, although undoubtedly morale was extremely high during this recent crisis, and there were no serious psychiatric problems. Battle-shock—a temporary state with abnormal fears and intolerance

of noise and vibration—did occur but soon resolved with rest, food, warmth, and reassurance. If psychotropic drugs came home unused, at least hypnotherapy proved useful, and some patients with severe burns were successfully hypnotised before their dressings were changed.

Sir James Watt brought the meeting to a close, and in a summary of the lessons learnt he called for more realistic participation by medical officers in peacetime exercises. He also called for more exercises, more training, and more government support for the services. Tribute was paid to all those who had taken part in the conflict and especially those who had contributed to the high standard of medical care. But has this conflict exposed more problems than it has solved? How apposite was Sir James's quotation from Bismarck: "Fools learn by their experience—I prefer to learn by the experience of others."

Is it possible that asthma is due to a deficiency of the cortex and possibly also the medulla of the suprarenal gland? In cases of fatal status asthmaticus has any change, microscopic or otherwise, been detected in any part of the suprarenal?

In the first decade or so that glucocorticoids were used to treat asthma considerable attention was paid to the possibility that deficiency of the suprarenal cortex might be a contributory factor to the development or potentiation of asthma. Rare examples have been recognised for an association between asthma and Addisonian adrenal insufficiency, but re-evaluation of earlier studies of adrenal cortical function in patients with asthma who have never received glucocorticoid treatment would indicate that relative or absolute deficiency of adrenal cortical secretion is unlikely to be anything other than a rare factor in asthma. No evidence for deficiency of adrenal medullary function has been associated with asthma. With fatal status asthmaticus the number of adequate necropsies has been small, and in those available there has been no recognition of a consistent change in the suprarenals other than those induced by previous glucocorticoid treatment. Again adrenal insufficiency does not seem to have been implicated as a contributory cause for death in asthma.—JOHN COLLINS, consultant physician, London.

What is the nature of the pigment that causes red hair, what is the mode of inheritance, and, apart from a tendency to sunburn, are any illnesses associated with red hair?

The pigments present in red hair are the pheomelanins, produced as a result of a genetically determined modification of the eumelanin pathway. There may be more than one genotype concerned, for there is no complete agreement as to the mode of inheritance. Red hair has been considered recessive to non-red but it has also been reported as dominant to non-red but hypostatic to brown and black. Red hair is not reliably associated with increased susceptibility to any disease other than the changes resulting from the fair skin's poor pigmentary response to sunlight and the readiness with which it is injured by chemical irritants.—A ROOK, consultant dermatologist, Cambridge.

Rife DE. The inheritance of red hair. *Acta Genetica Medica* 1967;16:342.
Rook A, Dawber R. *Diseases of the hair and scalp*. Oxford: Blackwell, 1982:354.
Singleton WR, Ellis B. Inheritance of red hair for six generations. *Journal of Heredity* 1964;5:261.

Has autotransfusion of blood been tried to treat a ruptured uterus in pregnancy, and is it safe provided that the blood is filtered? I am concerned particularly about the risk of amniotic fluid embolus.

Autotransfusion (reinfusion of a patient's own shed blood) was first suggested in 1874 in a graphic report¹ of a fatal case of postpartum haemorrhage. There is, however, no record of its actually being used in this condition. Although gynaecologists have used the technique for many years in treating ruptured ectopic pregnancy,² it has hardly ever been used for any other type of obstetric haemorrhage. The authors of a recent extensive review³ of autotransfusion conclude that it is contraindicated in obstetric patients because of the danger of contamination with amniotic fluid and fetal blood. Neither of these

contaminants would be removed by normal filtration—the methods usually used being filtration through several layers of gauze² or standard blood transfusion filters.⁴ Bacterial contamination may be reduced by autotransfusing only the red cells after washing,³ but this technique has not been tried in obstetrics. A desperately ill patient may sometimes be saved by unorthodox measures,⁴ and there is an anecdotal report⁵ of a patient in Samoa with placenta praevia being treated with autotransfusion without untoward reaction: the blood, however, was collected from the vagina before delivery of the baby and thus was probably uncontaminated. The safe advice^{3,4} is that autotransfusion is contraindicated by contamination of the shed blood (except for moderate contamination with bile⁴).—JAMES OWEN DRIFE, senior lecturer in obstetrics and gynaecology, Leicester.

¹ Highmore W. Practical remarks on an overlooked source of blood-supply for transfusion in post-partum haemorrhage, suggested by a recent fatal case. *Lancet* 1874;i:89.

² Myerscough PR, ed. *Munro Kerr's operative obstetrics*. 10th ed. London: Baillière Tindall, 1982:385.

³ Thurer RL, Hauer JM. Autotransfusion and blood conservation. *Current Problems in Surgery* 1982;19:97-156.

⁴ Klebanoff G. Intraoperative autotransfusion with the Bentley ATS-100. *Surgery* 1978;84:708-12.

⁵ Schilling JA. Discussion of paper by Langston *et al.* *Ann Surg* 1963;158:336.

As dipstick testing for glycosuria (Diastix, Clinistix) is so simple is there any place for the complicated routine of urine testing with Clinistest tablets?

Diastix and Clinistix use enzyme linked colour reactions that convert glucose finally to oxygen, and this in turn oxidises a colour reagent. The use of an enzyme system confirms specificity for glucose on the initial reactions, but since the colour reagent may react with oxidising agents in general, false positive results may occur. It is also possible that oxygen will be removed from the system by reaction with urinary reducing substances so that false negative results may result. It is unlikely that urine will naturally contain oxidising agents that will interfere with the performance of Clinistix or Diastix, but containers used for collecting urine that are contaminated with cleaning agents containing hypochlorite or peroxide may give false positive reactions. So it is essential that such containers are well rinsed out with water before use. Ascorbic acid and salicylates are reducing agents that do occur in urine, but false negative results will occur only in the presence of high concentrations of these substances and in practice they are unlikely to cause problems. One other form of interference that may affect dipstick tests for glycosuria and is unrelated to the presence of oxidising or reducing substances in urine concerns urinary ketone bodies. Diastix contains potassium iodide as part of its colour reagents, and this may form phenolic compounds with ketone bodies. This reaction may falsely depress colour development in the dipstick in the presence of concomitant glycosuria. Warning of this hazard may be achieved by using Ketodiastix—a combined stick test for glycosuria and acetoacetic acid in urine. Nevertheless, it is appropriate to use Clinistest for measuring the concentrations of urinary glucose. Clinistix, though unaffected by ketone bodies, is only semiquantitative and so is not ideal for this purpose. In summary, when testing for glycosuria, it is generally quite appropriate to use dipstick tests, especially as they are more sensitive than Clinistest. Clinistest may be reserved for measuring the level of glycosuria in the presence of ketone bodies and for detecting other urinary reducing substances.—A H C BIGNELL, top grade biochemist, Birmingham.