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ORIGINAL ARTICLE

Medicine in the heart of the Antarctic: 1908–2001

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Prehospital care in the United Kingdom rarely lasts more than a few hours other than in exceptional circumstances (for example, mountain and cave rescue, oil rigs). In other parts of the world hospitals may be much more distant and in expeditions to remote areas, prehospital care may extend to days or even weeks. When this occurs, the boundaries between primary care and prehospital care blur.

In 1908/9 Sir Ernest Shackleton led an expedition to the South Pole. He failed to reach his goal but got to within 97 miles of the Pole. In his book *The heart of the Antarctic*¹ he describes the drugs and medical equipment which he took with him on his march South. These are shown in boxes 1 and 2. The total weight of medical equipment and stores was seven pounds.¹ As most of these drugs will be unfamiliar to modern doctors and some of those which are familiar may have been used in a different way, I have described their uses. They can be compared with the medical supplies that are taken into the field by teams from the British Antarctic Survey (BAS). These are contained in a wooden box (the field medical box) and weigh about 40 pounds (see box 3).

METHOD

Each drug was looked up in a pharmacopoeia of the time and details of the drugs are given. The main source was the British Pharmacopoeia of 1907² but where that did not mention the drug,

the British Pharmacopoeia of 1911³ and Martindale of 1910⁴ were consulted. Then, as now, drugs might have several uses and might be used in different ways (for example, orally and topically). I describe the most likely indications for which each drug was taken. Indications for drugs that would not have been relevant for Shackleton's expedition have been omitted.

RESULTS**Boric acid**

This was used as a mild antiseptic. It was also used as a food preservative but it is unlikely to have been used in this way as, although they ate their horses, the cold would have preserved the horsemeat.

Perchloride of mercury (mercuric chloride)

This was used as an antiseptic and disinfectant. As an ointment it was used to treat parasitic skin infections.

Iron and arsenic composition

Iron was used not just for anaemia but "has a tonic action in all chronic cachectic conditions, such as malaria, syphilis, lardaceous disease, and tubercle; that is, it tends to improve the functions of the body." It was also used "as a tonic to promote appetite, and to improve the general condition...".³ Arsenic was "employed in certain diseases of nutrition and as a general tonic, but how it exerts a beneficial action is unknown." The combination of iron and arsenic was used primarily to treat pernicious anaemia but I presume that it was taken to the Antarctic for use as a general tonic.

Eye soloids

Soloid was a trade name for a range of preparations manufactured by Burroughs Wellcome. The Soloid range included drugs, nasal

Box 1 Drugs taken by Shackleton

One tube laxative pills
 One tube boric acid
 One tube perchloride of mercury
 One tube iron and arsenic composition
 One tube quinine bisulphate
 One tube eye soloids
 One tube Hemasins (adrenalin)
 Two tubes cocaine hydrochloride
 Two tubes zinc sulphate
 One tube aloin compound
 One tube Crete aromata cum opio
 One tube chlorodyne
 One tube sulphonal
 One tube soda mint
 One tube bismuth pepsin charcoal
 One tube potassium chlorate
 One tube ammonium bromide
 One tube ginger essence
 One tube sodium salicylate
 One tube morphine sulphate
 600 tabloids Easton's syrup (1 dr)

Box 2 Dressing materials and medical equipment taken by Shackleton

Two clinical thermometers
 Four first field dressings
 Two triangular bandages
 Two ounces compressed absorbent wool
 Two ounces compressed cyanide gauze
 Two pieces wood splinting
 One reel adhesive plaster
 Packet court plaster
 One tube gold beaters' skin
 One pocket surgical dressing case
 Two pairs spare goggles and spare glasses
 One pair molar dental forceps
 Two bottles Newskin
 Six ounces emergency Oxo

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preparations, culture media, and microscopic stains.⁵ "Eye soloids" presumably refers to eye drops and/or ointment. The actual drugs used are not mentioned.

Quinine bisulphate

This is more soluble than quinine sulphate. It was used not only for malaria but also for intermittent fevers, continued fevers, and as a tonic.

Adrenalin (Hemesin was a trade name)

This was used for sudden cardiac failure. It was also used then (as now) for creating a bloodless field for minor surgery and for potentiating the effects of local anaesthesia.

Cocaine hydrochloride

This was used as a local anaesthetic. In pill form it was also used to relieve gastric pain and to allay sea sickness.

Zinc sulphate

Zinc sulphate was used for nervous disorders such as chorea and epilepsy. It was also used as an astringent in diarrhoea. Topically it was used as an astringent to lessen secretions from mucous surfaces in leucorrhoea and subacute gonorrhoea.

Aloin

This is a plant extract from aloes and was used as a purgative. "It is one of the most valuable drugs in the treatment of chronic constipation."²

Crete aromat cum opio

This mixture of chalk and opium was used for diarrhoea.

Chorodyne

This mixture consisted: chloroform 6, morphine 0.5, tincture of Indian hemp 3, tincture of capsicum 1.5, liquid extract of liquorice 12, mucilage of acacia 12 (used to maintain the other substances in suspension), treacle 25, glycerine 22, oil of peppermint 0.1, alcohol to make 100. It was used for diarrhoea, colic, and flatulence. It was also used for coughs and as a sedative and antispasmodic.

Sulphonal

Sulphonal was used as a hypnotic.

Soda mint (compound sodium bicarbonate tablets)

This was used as an antacid and as a carminative (that is, a drug to reduce gas in the gastrointestinal tract) in gastric flatulence.

Bismuth pepsin charcoal

Bismuth pepsin charcoal itself is not mentioned in the 1907 British Pharmacopoeia but bismuth and pepsin mixture was used as a sedative to the gastric mucous membrane and was also used as a digestive. The pharmacopoeia describes other substances added to the mixture including iron, podophyllin, and strychnine. A mixture of bismuth and pepsin with charcoal would seem (to a doctor in 2001) to be less harmful than the other mixtures!

Potassium chlorate

This toxic substance was mostly used topically. The theory behind its use was that it gave up oxygen to the tissues and so it was used as a gargle for inflamed and spongy gums, aphthous ulcers and tonsillitis. It could also be used on skin ulcers.

Ammonium bromide

Used as a general sedative with a more rapid action than potassium bromide.

Box 3 Contents of BAS field medical box 2001

Tablets

- Gastrocote (alginic acid, aluminium hydroxide, magnesium trisilicate, and sodium bicarbonate)
- Loperamide
- Senna
- Cetirizine
- Metoclopramide
- Aspirin
- Paracetamol
- Codydramol
- Tramadol
- Erythromycin
- Co-amoxyclav
- Metronidazole
- Ibuprofen
- Fluconazole
- Microgynon 30
- PC4

Injections

- Adrenaline 1 in 1000
- Chlorpheniramine
- Prochlorperazine
- albuphine
- Hydrocortisone
- Cephuroxime
- Lignocaine
- Water for injection

Eye preparations

- Acyclovir eye ointment
- Framycetin eye ointment
- Cyclopentolate eye drops
- Pilocarpine eye drops
- Fluorescein eye drops
- Amethocaine eye drops

Topical preparations

- Acyclovir lip cream
- Aqueous skin cream
- 1% hydrocortisone cream
- Factor 30 sun protection cream
- Factor 15 sun protection li salve
- Silver sulphadiazine cream (Flamazine)
- Zinc undecanoate dusting powder (Mycota)
- Savlodil sachets
- Zinc ointment
- Lignocaine gel 2%
- Moist tissue wipes

Others

- Anusol HC suppositories
- Sodium chloride and dextrose oral powder (Dior-ylate)
- Adcortyl in orabase
- Oil of cloves
- Cavit (for temporary dental fillings)

Dressings, etc

- Tubigrip
- Bandages conforming and crepe
- Adhesive tape—elastoplast and micropore
- Wound dressings—various
- Safety pins
- Eye patch and dressing
- Gauze swaps
- Plaster of Paris and orthopaedic padding

Equipment

- Syringe 5 ml
- needles—various
- IV cannulas—various
- Mediswabs
- Velcro tourniquet

Box 3 continued

- Dental rolls
- Laerdal pocket mask
- Oropharyngeal airway 3 sizes
- asopharyngeal airway
- Hand operated sucker
- Ryles tube
- Clinical thermometer and low reading thermometer
- Polythene bags for burns of hand and feet
- Disposable latex gloves
- Adjustable Stifneck extraction collar
- Foley catheter
- Bladder syringe
- Eye bath
- Suture set
- Scalpel handle and blades
- Dental mirror and dental excavator
- First aid manual

Ginger essence (strong tincture of ginger)

Used as a carminative and aromatic stimulant in atonic dyspepsia and flatulence. It was also added to purgatives to prevent griping.

Sodium salicylate

This is described in the pharmacopoeia mostly as an antipyretic. Its other main use was for acute rheumatism but it was also used for chronic rheumatism, sciatica, and neuralgias of rheumatic origin.

Morphine sulphate

Morphine sulphate was used as an analgesic and was also said to arrest useless coughs (though it was contraindicated in productive coughs) and was useful for diarrhoea and colic. It could also be used for sedation, particularly in patients with internal haemorrhage and in patients with “febrile illness, especially where sleep is delayed, morphine is invaluable.”²

Tablets of Easton’s syrup (syrup of phosphate of iron with quinine and strychnine)

Easton’s syrup was used as a tonic during convalescence from acute disease, in general debility with anaemia, and in neurasthenic conditions. Tablet was a Burroughs Wellcome trade name. The company made its reputation by producing drugs in tablet form and the name “tablet” came to be used as a synonym for tablet. Shackleton obviously uses the word with this meaning but in fact it was used by Burroughs Wellcome to indicate a range of products including dressing materials, injections, and medicine cases.⁵ Shackleton took a Tablet medical case to Antarctica.⁶

Cyanide gauze (gauze impregnated with mercury and zinc cyanide)

Mercury and zinc cyanide was used as a germicide and antiseptic.

Court plaster

Issinglass was a transparent jelly prepared from the dried swimming bladder of a fish from the Black and Caspian Seas. It consisted mostly of gelatin. This, when spread onto silk was called court plaster. It was used as a dressing material

Gold beaters skin

This preparation was the peritoneum of the ox or of the sand shark, which was kept in alcohol and used to cover granulating wounds.

New skin

This was a collodion (pyroxylin in ether and alcohol). This is still used. It was applied to surgical wounds, cuts, abrasions, and chilblains. When the solvents evaporate the pyroxylin forms a protective “skin” over the wound.

DISCUSSION

Burroughs Wellcome presented at least one of their medical kits to Shackleton.⁶ I am uncertain whether this was taken on the South Pole expedition or whether this was left at the base camp and a smaller kit taken.

Clearly there are many differences between Shackleton’s expedition and the field parties of the BAS. The former was a private expedition of four, relatively young, male explorers who had to be self sufficient for 91 days without communication with their support party. The group contained a doctor. The BAS is a government run research organisation and the scientists and support staff (male and female) have an employee’s right to the best Health and Safety services compatible with the environment. The staff are mostly young but can be of any age though all have to pass a strict medical examination before being allowed to go to Antarctica. Medical care in the field is provided by first aiders with extended training. They have radio communication to Antarctic bases and from there back to the BAS headquarters or to medical advice from consultants at the BAS Medical Unit (BASMU) based in the Accident and Emergency Department in Plymouth. Modern Antarctic travel can take advantage of skidoos and aircraft (during the Antarctic summer). The field medical boxes are designed to support all groups in the field from a group of two working unsupported for several months to a larger group of five or six people for a shorter time. The box also serves as first aid supplies for an aircraft if it was forced into an unexpected landing. There may be occasions when the field party contains a doctor. There are more medical supplies held at the BAS bases and, at the larger bases with a full time doctor, these include equipment to provide anaesthesia and to do surgical procedures.

Despite the differences between 1908 and 2001, there are also similarities. The environment and weather are just as hostile as they were in 1908 and it is still possible for field parties to be trapped in bad weather and for aircraft to be unable to fly for several weeks. The medical equipment has to be more than a first aid kit and to provide the medical care for illness that could occur over a several week period. It also needs to provide the “over the counter” remedies that patients would normally not seek from a doctor. Weight and volume are limited on sledges whether pulled by horses and explorers as on Shackleton’s expedition or by skidoo, and compromises have to be made between the comprehensiveness of medical equipment and its weight and volume (this must be considered by anybody who feels that the list of equipment and drugs supplied by BASMU is inadequate).

It is not possible to determine from Shackleton’s book why the drugs and equipment that were taken, were chosen. They seem to be a strange choice to the modern practitioner and the differences between 1908 and 2001 clearly reflect major changes in medical practice and these changes do not need to be explained. They are presented as being of interest and the only lesson is to wonder how the 2001 medical box will appear to doctors in 2094.

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