James Lind: pioneer of naval medicine

This year we celebrate the 300th anniversary of the birth, on 4 October 1716, of James Lind, one of the early pioneers of naval medicine, who demonstrated the efficacy of fresh fruit in the treatment of scurvy and who stressed the importance of hygiene in maintaining the health of sailors in the long sea voyages of those days.

James Lind was born in Edinburgh; his father was a merchant. After attending grammar school in Edinburgh, James was apprenticed to a local surgeon, George Langlands, and also attended a course of lectures by the renowned anatomy teacher, Alexander Munro *primus*. With no other formal qualification than his apprenticeship (as was not at all uncommon in those days), Lind joined the Royal Navy as surgeon in 1738. Lind spent the next 9 years at sea, mostly in ships in the English Channel during the War of Austrian succession. During this time, Lind developed his interest in the two subjects which were to occupy him during his medical career – the cause and treatment of scurvy and the general welfare of seamen.

On leaving the Navy, Lind returned to Edinburgh and the following year, 1748, graduated Doctor of Medicine (MD) at the University with a thesis on venereal disease. His career over the next 10 years is not precisely documented; it is assumed that he engaged in medical practice in Edinburgh. He was elected a Fellow of the Royal College of Physicians of Edinburgh in 1750 and became its treasurer 6 years later. During his time in Edinburgh, Lind published his most important works, his 'Treatise of the Scurvy' (1753), followed by 'An essay on the most effectual means of preserving the health of seamen in the Royal Navy' (1757).

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In 1758 Lind was appointed Physician in Charge of the Haslar Royal Naval Hospital at Gosport. This magnificent institution remained the principal naval hospital until its recent closure. Lind remained in post until 1783, when he was succeeded by his son John. While at Haslar, Lind published new editions of his two books as well as 'An essay on diseases incidental to Europeans in hot climates', which was published in 1768.

Scurvy, the subject of Lind's first book, was an important problem for seafaring nations and had been widely recognized for centuries as a serious, often lethal, disease of seafarers. In its early stages there would be stiff joints (caused by haemorrhage), loosening of the teeth and severe lassitude. Later would follow subcutaneous bleeding, old wounds would break down, the patient would suffer weakness and then death. An illustration of the ravages of scurvy is demonstrated by Anson's famous 4-year voyage around the world (1740–4). Of 1400 men, nearly 1000 died of the disease. Several authorities, and indeed many sailors, advocated fresh fruit and vegetables as treatment.

Lind, in his treatise, pointed out that diet appeared to be a key feature in both the origin and the cure of scurvy and also that outbreaks appeared to be associated with cold and wet weather. He believed that scurvy was basically a disease of faulty digestion and excretion. On long voyages, the digestive system of the seaman is unable to cope with the diet of salt meat and hard ship's biscuits, especially in close wet weather. The stomach cannot breakdown the diet provided to the crew at sea into small digestible particles. At the same time, the pores of the skin tend to close up in the poor weather, thus further impairing healthy excretion by perspiration.

As for cure, Lind advocated reversal of these conditions; a warm dry atmosphere coupled with a more readily digestible diet. In this context, Lind reported in his 'Treatise' what he calls his 'experiments' conducted on board HMS Salisbury in 1747, when he was in service as the ship's surgeon. He divided 12 seamen suffering from scurvy into six pairs and prescribed different remedies for each pair: cider, elixir of vitriol, vinegar, sea water, oranges and lemons and finally a purge prepared from garlic, mustard seed and other substances. The pair given oranges and lemons quickly recovered, while the others did not.

The significance of this, what must be regarded as the first prospective randomized clinical trial, was not given the importance it deserved by Lind. In those days there was no concept of a single factor, present in fruit and vegetables, that was specific in its action and produced the disease when it was deficient. It was not until Sir Gilbert Blane (1749–1834), physician at St Thomas's Hospital and Commissioner on the Board of the Admiralty, induced the Admiralty to order the use of lemon juice and other fruits and vegetables as antiscorbutics on ships at sea in 1796.

It is now known, of course, that scurvy is caused by deficiency of the water-soluble vitamin C (ascorbic acid), which is essential for the synthesis of collagen. Most animals can manufacture this vitamin, but man shares with the guinea pig the defect of being unable to produce this vital chemical and so relying entirely on dietary sources for its supply.

Lind's text on 'Preserving the Health of Seamen', which ran through three editions, also advocated better hygiene on ships, with regular fumigation, good ventilation, obligatory bathing, wholesome drinking water obtained by distillation, the use of beer rather than spirits and much more useful advice.

Lind died in 1794 in Gosport and is buried at St Mary's Church in Porchester.

Lind's books were widely quoted and translated and the regimen he established at Haslar was well respected. His influence on the health and welfare of seamen is undisputed. **BJHM**

Conflict of interest: none.