Commentary

Lessons from History: Still Relevant in the “Information Age”

Once you eliminate the impossible, whatever remains, no matter how improbable, must be the truth.

— Sherlock Holmes (by Sir Arthur Conan Doyle, 1859–1930)

In this edition of CJGIM, Aujnarain et al. present an interesting case and a fascinating disease. In so doing, they also provide several reminders for our specialty: (1) before you can treat a disease, you must think of it; (2) our work remains as much cerebral as procedural; and (3) when all else fails, perform (and then re-perform) a full history and physical examination. It is also a chance for those of us excited by history and discovery (the so-called “exploration of alleyways to see if they are blind”) to retell a story that is equal parts science, tradition, and innovation — much like medicine itself.

Most people know that scurvy refers to a deficiency of vitamin C that impairs collagen synthesis and results in weakness, bleeding, and unhealed wounds. Scurvy is fatal if untreated for months, but is otherwise easily prevented and cured. Therefore, it is now rare, and often not considered until multiple specialists have been engaged and many diagnoses ruled out. Accordingly, its historical importance may be tough to grasp. However, with the exception of famine, scurvy has caused more suffering than any other nutritional disease. Its infamy is further illustrated by the fact that it is not just a noun but also a pejorative adjective, meaning worthless, contemptible, or vile.

Derived from the Latin scorbutus, it was described by Hippocrates over 2,000 years ago. While the need for vitamin C seems elementary to modern readers, the journey to discovery represents centuries of theory versus counter-theory, and unmoved traditionalists versus scientific pioneers. It encompasses high seas adventure and travel to the most inhospitable lands of earth. An argument can also be made that the history of Canada (and the history of northern exploration) is actually the history of conquering scurvy.

Portuguese and Spanish sailors secured the southern routes to the “New World.” This left the French and British to battle for less tropical lands to the north. Samuel Champlain’s early voyages to Canada, the pilgrim’s first winter, and Franklin’s ill-fated journey to the Northwest Passage were almost certainly beset by scurvy. The Irish potato blight of 1845–1848 caused horrific starvation along with widespread scurvy. This catalyzed mass migration to North America, and Canada was a more affordable destination than America. This is one reason why over four million (or approximately 14%) of the Canadian population has Irish roots.

Until the 19th century, scurvy killed more sailors than enemy action. The eventual adoption of antiscorbutics (and improved hygiene in general) changed this dramatically. James Cook (arguably the greatest explorer of all time) mapped Newfoundland and claimed for Britain the west coast of North America (along with the South Pacific and Antipodes). Cook relied upon (relatively ineffective) sauerkraut but coupled this with regular replenishment of fresh food. By the 1790s, and following regular citrus rations, the British navy could remain at sea longer than the French. This was crucial in the eventual victory over Napoleon Bonaparte and, therefore, the transfer of French North America to the British. This helps explain why this Canadian editorial is written in English rather than French. It is also why this English-Canadian author has to tolerate being called a “limey.”

North American Natives knew to store berries and leaves. They also got vitamin C from a raw diet that included organ meat. Interestingly, during his 1903 and 1911 expeditions, the British explorer Robert Scott (“Scott of the Antarctic”) was meticulous about eating fresh meat while at base camp (seals and penguins … for those of an epicurean bent). Fresh meat contains some vitamin C, and his team remained healthy. However, on long-range expeditions, he carried dehydrated meat (which he boiled, thereby destroying its vitamin C). Predictably, Scott’s group developed scurvy within 3 months of the switch to pemmican. He was also foiled because the prescribed lime juice was boiled in copper vats, which denatured the vitamin C. In addition, Scott was a victim of alternative theories of nutrition. His chief physician believed (like many) that scurvy was caused by bacterial contamination rather than nutritional deficiency. Scott fallaciously believed he would avoid nutritional deficiency because of the care taken in the preparation of his pemmican.

Scurvy does not occur in most animals because they...
synthesize vitamin C. Humans and primates lack the enzyme L-gulonolactone oxidase. In the 1400s, Vasco da Gama sought out Moorish traders for “their fine oranges.” In the 1500s, Jacques Cartier explored the St. Lawrence River, and mimicked Natives by making tea from the needles of the arbor vitae tree (white cedar). Sir Richard Hawkins suggested using citrus fruit to eradicate scurvy in the 1500s, as did Sir James Lancaster in the 1600s, and Johann Bachstrom in the 1700s. However, it is James Lind who is best known. This is because he performed what most believed to be the first randomized clinical trial.

In 1747, Lind divided 12 sick sailors into groups of two and prescribed one of six treatments: (1) alcoholic cider, (2) elixir vitriol, (3) vinegar, (4) sea water, (5) oranges and lemons, and (6) spices. The modern reader would not be surprised that group five showed the greatest improvement. However, Lind had no idea why oranges and lemons worked. He chose his treatments because they were common. Nor did he question the leading hypotheses, which included “putrefaction,” “blocked perspiration,” and “an excess of melancholic humor.” It took until the 20th century and required worldwide efforts to understand the role of vitamins, to isolate what became known as vitamin C, to determine its chemical structure, and to synthesize it commercially. Discovery requires time … often a lot of time. It also requires the best of the world to collaborate freely.

Modern-day scurvy has occurred in students (poor diet combined with excess alcohol), those living in isolation (no access to fresh food), those belonging to extreme diet groups (zero carbohydrates), and those beleaguered by alcohol or drugs. Ideas used to travel via the high seas, but now travel by the Internet superhighway. The web can help form virtual communities that challenge established knowledge, foster distrust of authority, and increase non-mainstream behaviour (including extreme diets). In short, vitamin deficiency can still occur in modern Canada just as it occurred in our exploratory past. We should remain alert to the possibility even in this so-called “information age.”

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References