

Ancient Maladies: An Exploration of Disease and Pathophysiology in Tanach and in the Talmud

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Scurvy, a disease caused by the lack of sufficient vitamin C, is characterized by bleeding of the gums. During the 18th century, scurvy surfaced as a pathology affecting poorly nourished sailors who spent many months aboard a ship without a dietary source of vitamin C. Although rare in the United States, scurvy affects the elderly and infants whose diets are deficient of vitamin C rich foods such as fresh fruits and vegetables due to economic or social reasons [1].

Primary symptoms of scurvy include irritability, tenderness, bleeding, fever, and rapid breathing. As the disease progresses, secondary symptoms involve bleeding of the gums and loosened teeth. Treatment for scurvy is relatively easy, as patients are administered vitamin C either orally or by injection. Additionally, vitamin C supplementation pills or eating foods with high concentrations of vitamin C, such as lemons, oranges, guava, broccoli, and bell peppers is also recommended for treatment and maintenance. Interestingly, animal meat also has a high concentration of vitamin C, so consumption of muscle and liver are also used to treat scurvy. However, because cooking destroys vitamin C, lightly cooked meat provides the most health benefit [2].

Scurvy was the most common pathology that affected sailors while traveling long voyages at sea. During the 18th century, scurvy killed more British sailors than their own enemies. Although citric fruits and vegetables were supplied on board the ships, the produce either spoiled due to lack of refrigeration or the supply was insufficient for the long trips. Evidently, the connection between scurvy and the consumption of citric fruits and vegetables was eventually recognized. To provide fruits and vegetables for its sailors, the Portuguese established a stopping point where they planted fruits and vegetables to restock the ships and to send home to those who developed scurvy.

However, the connection between proper nutrition and scurvy was not appreciated by physicians of that time. From the 13th to the 18th century, many physicians did not believe that the cure for scurvy was the consumption of citric fruits and vegetables. Instead, they incorrectly assumed that faulty digestion induced by the hardships of life on the sea was the factor that caused scurvy in sailors.

Evidence that the consumption of citrus fruits and vegetables was a preventative factor to scurvy was established in the 1760s James Cook, a British explorer and navigator. He was able to successfully voyage around the world due to both the cleanliness of his ship and the constant replenishment of fruits and greens, which

prevented his sailors from developing scurvy. Additionally, in the 1790's a Spanish naval officer, Alessandro Malaspina, made a 56-day sea journey without having any of his sailors developing scurvy. Malaspina correlated the lack of scurvy with the consumption of oranges and lemons. Convinced these fruits were essential to prevent scurvy, Malaspina, with assistance from Spain's large empire, created many ports for sailors to acquire fresh fruit [3].

In 1747, Scottish physician, Dr. James Lind experimented and thereby identified an efficient and effective cure for scurvy. He provided 12 patients with garlic, vinegar and lemons. He found that the consumption of garlic had no effect on scurvy, the vinegar yielded a slow recovery from scurvy, but the consumption of lemons worked quickly and efficiently to eliminate scurvy. After this discovery, it was common for sailors to travel with crates of lemons and lemon juice before departure, hence the term 'limey' for British sailors. As mentioned earlier, the British explorer James Cook was most notable for never losing a passenger or a sailor to scurvy [4].

In Talmudic times scurvy was known as *tzafdinah*. Great Rabbis in Jerusalem and Babylonia dealt with this disease, which manifested as abnormalities in connective tissue responsible for a normal build (Avodah Zara 28a). In the Talmud, *tzafdinah* is characterized by bleeding of the gums (Genesis Rabbah 33:2, 96:2). Today, it is known that vitamin C is important for the formation of bone and connective tissue. Successfully, Rabbis were able to identify a cure for this illness, which existed in their villages. In the Talmud, *tzafdinah* is characterized by bleeding of the gums (Genesis Rabbah 33:2, 96:2). Rashi explained that *tzafdinah* is a life threatening disease, which originates in the mouth and terminated in the intestines; in essence it was described as a sickness of the teeth and gums (Avodah Zarah 2:2). Rabbi Judah, one of our sages was affected and suffered by *tzafdinah* for seven years. Another case in the Talmud (Yoma 84a) notes that Rabbi Yochanan too suffered with *tzafdinah*, which was described as a sickness of the teeth. Rav Yochanan agreed to take medicine on Shabbat, proving that the disease was in fact hazardous, and therefore is allowed to be treated on the Shabbat [5].

The Talmud states that the contributing factors for *tzafdinah* include eating cold wheat, hot barley, or fish left overnight. Intriguingly, one of the suggested ways to treat this malady was to ingest a mixture of olive oil or to place

burned, unripe olive seed ashes between one's teeth [5]. Modern scientific research explains this idea from the Talmud by showing that strains of the bacteria, *Mycobacterium tuberculosis* and *Treponema pallidum*, can cause mouth sores, perhaps explaining why the Talmud is concerned about eating fish that has stayed out overnight. For the immune system to work properly, the body needs an adequate supply of vitamin C. If vitamin C is lacking, the body is vulnerable to bacterial infection, which may lead to mouth sores and progress to scurvy. The connection between grain products and *tzfadinah* also may focus on the immune system, as there is a protein in gluten that the immune system recognizes as foreign, causing mouth sores to develop [6]. The Talmud also notes the curative properties of olive oil. Recent research has shown that olive oil contains cyclooxygenase as an anti-inflammatory agent. The mouth sores indicative of scurvy may result from mucous inflammation which can be treated by olive oil or the ashes of burned olives placed in between the teeth, just as the Talmud described [7].

Nevertheless, scurvy should not be viewed as merely a dental issue. Its initial symptoms include weakness, fatigue, and sore legs and arms. However, without vitamin C treatment, a reduction in red blood cells gum disease, loss of teeth, and bleeding from the skin may become apparent. As the condition worsens, poor wound healing and death from infection may ensue [8].

The Mishna Yoma (8:6) discussed life-threatening illnesses and the proper measures for their treatment on Shabbat. The Talmud (Avodah Zara 28a) states that Shabbat can only be violated for an 'internal affection'. The word

'internal' is outlined as "anything from the lips and inwards". Rabbi Matitia ben Cheresch discussed that if one has pain in his throat, he is permitted to take medication on Shabbat because there is a possibility of danger to human life, and every danger to human life overrides the laws of Shabbat. Maimonides (1135-1204) understood this as referring to treating rotting gums, which progressed to rotting of the palate, creating a life threatening illness [5].

Today, we know that in order to protect ourselves from scurvy vitamin C must be consumed every day. Ingestion of vitamin C containing products eliminates the symptoms of scurvy within two or three days. Citric fruits and vegetables are recommended. In the time of the Talmud, a potential source of vitamin C was the consumption of an *esrog* (citron) (Abodah Zarah 76b). An *esrog* was used for medical purposes in the medieval times to prevent seasickness, scurvy, and other disorders. A citron has high vitamin C content, explaining its efficacy for treating scurvy. With the geniuses of the Talmudic sages, experienced sailors, and physicians, scurvy's life threatening gum disease is a thing of the past.

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