THE SPLEEN

Making sense of this undervalued organ

Situated between the stomach and diaphragm, near the left kidney, the spleen is the largest mass of lymphatic tissue in the body, measuring about 12cm (5 inches) long. The spleen doesn't actually filter any lymphatic fluid; it plays a key role in immunity by producing lymphocytes, which develop into antibody-producing cells. It also phagocytises (captures and digests) worn out and damaged red blood cells and platelets and also bacteria, as well as acting as a storage organ for blood.

The spleen is composed of two types of tissue: white pulp and red pulp. The white pulp is involved in the immune system and produces B lymphocytes; the red pulp acts as the blood filter and storage reservoir.

The spleen is easily ruptured in cases of abdominal injury, causing severe haemorrhage and the need for an emergency splenectomy – removal of the spleen. It is a myth that the spleen is not needed, though, as it is a key player in immunity.

The spleen is the only source of tuftsin, a key stimulator of the immune system, a lack of which is associated with an increased risk of infection.[1,2,3] Tuftsin stimulates macrophages, which engulf and destroy foreign particles, including bacteria, cancer cells and cellular debris. Two-and-a-half per cent of patients who have their spleen removed subsequently die from pneumococcal pneumonia within five years of undergoing a splenectomy.[4]

Splenopentin, a peptide similar to tuftsin, also made in the spleen, appears to increase white blood cell counts for those with a low count[5] and studies in the 1930s giving spleen glandulars to those with splenectomy conceived that the splenopentin they contained increased white cell counts.[6,7,8,9]

Many nutrients are known to support and enhance immune function and some have a direct action on the spleen, especially in relation to its ability to produce lymphocytes.

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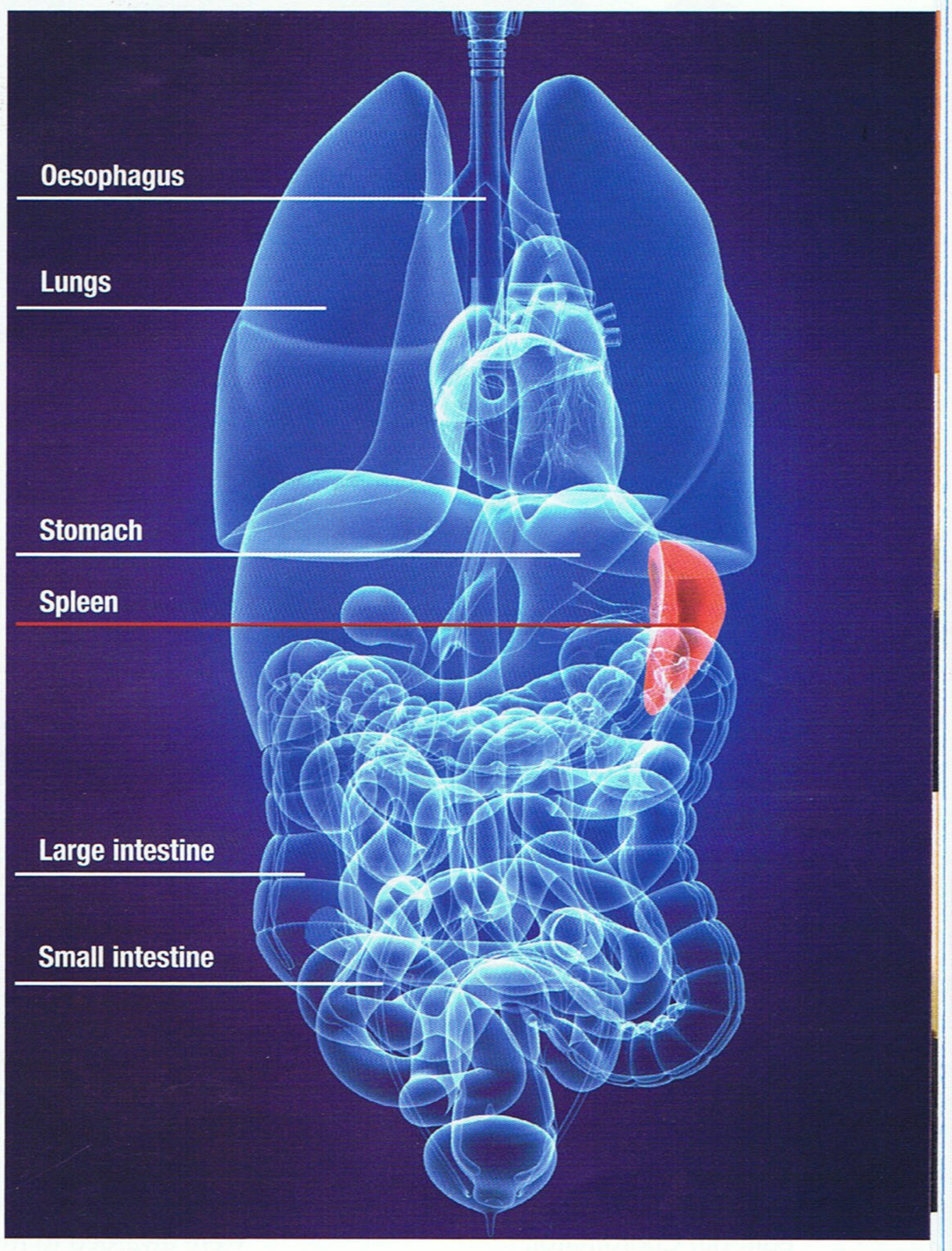

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Zinc plays a vital role in the immune system and zinc deficiency causes hypoplasia of the spleen, reducing lymphocyte production by as much as 50 per cent,[10] reducing the ability to make antibodies,[11,12] reducing the production of tumour necrosis factor (TNF), and reducing cytokines that regulate immune function and are involved in inflammation.[13]

A lack of tryptophan is known to affect production of IgG and IgM antibodies,[14] while a deficiency of all amino acids is associated with a reduction in the ability of the spleen to produce antibodies[15] as is a lack of vitamin A.[16]

Selenium has been shown to help both humoral and cell mediated immunity (humoral immunity is an acquired immunity in which the role of circulating antibodies is predominant, whereas cell mediated immunity is acquired immunity where the role of T lymphocytes is predominant), with a selenium-enhanced diet improving the NK (natural killer) activity of spleen cells by an average of 70 per cent.[17]