Immunity and Nutrition

Breastfeeding protects babies against infection and has long-term beneficial effects on metabolism and disease, later in life. Human milk is perfectly formulated to strengthen the newborn’s defence mechanisms against organisms and foreign substances that may be harmful to the baby.

This article will discuss the important role the gastrointestinal (GI) tract plays in the immunity of neonates.

Introduction

The intestine is the largest organ in the immune system. The other organs in this system are the thymus, lymph nodes (like the tonsils), bone marrow and the spleen. These organs produce immune cells that arm the respiratory epithelia (lining of the nose, airway and lungs) and the skin against bacterial and viral onslaughts. The immune cells are constantly produced and the old cells are removed by the spleen.

Every mouthful of what we eat and drink goes through the intestinal tract and it is here where the nutrients are separated from the toxins and other harmful substances. The inner layer of the gut (mucosa) is the discerning and protective barrier and determines what is absorbed and what is dumped. The second barrier is the liver, scrutinising and detoxifying every molecule in the blood.

The body reacts to everything that is absorbed and most of the body’s immune cells are, at some time, present in the deeper layers of the intestinal wall. It is here where the body is exposed to potentially lethal substances and the development of a normal immune function is vital for survival.

Getting right to absorption and immunity

Not everything we eat is fit for human absorption and the body ensures that food is properly processed and digested before it is absorbed. Chewing, salivation, stomach acid, bile and other mucus produced by the goblet cells are only some of the processes involved.

The gastrointestinal tract also contains bacteria, called intestinal flora. These bacteria assist the body to digest food by producing special enzymes. These enzymes break down foods into non-toxic absorbable substances.

Immediately after birth the intestines of infants are totally sterile and do not contain any bacteria, not even ‘good’ bacteria. During the natural birth process, the infant receives some beneficial bacteria from the mother. This gift of organisms immediately starts to multiply in the tiny GI tract of the infant and boosts its immunity. *Bifidobacteria infantis* is the dominant bacteria in the infant’s digestive tract. These bacteria decrease the growth of so-called rota-viruses which cause diarrhoea and thrush, thus protecting the newborn infant against common infections. The bifidobacteria also help to prevent lactose intolerance and increase the absorption of minerals and B vitamins, and boost the infant’s immature immune system. Breastfeeding is an excellent way of increasing the number of bifidobacteria in the infant’s GI tract.

Infant formula has also been supplemented with these beneficial bacteria in the form of bifidobacteria and lactobacilli called probiotics to enhance this response in non-breastfed infants. These probiotics compete with harmful bacteria in the GI tract for food and prevent the transport of pathogens into the body. Probiotics also increase the uptake of important minerals from the GI tract thus preventing deficiencies which can also lower immunity. As humans get older, they develop a deficiency of beneficial bacteria and therefore become more vulnerable to infections.

References available on request