

A BALANCED IMMUNE SYSTEM IS ESSENTIAL FOR GOOD HEALTH

Type 1 and type 2 cytokines regulate the immune response

Type 1 cytokines induce immune responses against viruses, some bacteria and cancers, while type 2 cytokines induce responses against parasites and most bacteria. Type 2 cytokines suppress production of type 1 cytokines and type 1 cytokines suppress type 2. In good health, production of type 1 and type 2 cytokines is well balanced, with the appropriate type of reaction occurring whenever it is needed and being swiftly terminated by the other type after the danger has passed. Too much type 2 response can suppress anti-cancer and anti-virus responses and can lead to allergic disease, while too much type 1 response can cause the immune system to react against its own tissues (autoimmunity).

Diet and immunity

A properly balanced diet will provide all the necessary ingredients for adequate immunity, but both malnutrition and obesity can upset the balance between type 1 and type 2 cytokines and lead to immune deficiency and illness. Providing adequate nutrition to the undernourished and reducing calorie intake in the obese reverses these deficiencies. Inhalation of pollutants such as particulates in diesel exhaust also adversely affect the cytokine balance.

Exercise and immunity

People who exercise moderately but regularly have a significantly lower incidence of infections than those who take no exercise. As little as 30 minutes of brisk walking per day can improve immune system balance and function. In old age type 2 cytokines come to dominate over type 1, but elderly people who have been active throughout life maintain type 1 responses, have stronger immunity and suffer less illness than those who have followed a more sedentary lifestyle.

Stress and immunity

Failure to understand and cope with stress can lead to adverse physiological changes, immune suppression and illness. The stress hormone cortisol increases type 2 and suppresses type 1 cytokine production. Cortisol is increased and the immune system compromised at times of bereavement, divorce, job loss, financial loss, examinations, national disasters, etc. In all these cases interventions that reduce stress levels have succeeded also in improving measurements of immunological function and the balance between type 1 and type 2 cytokines.

Conclusions

In Hong Kong most of us are exposed to high levels of pollution, are often stressed, take little exercise and may not take the time to eat properly. These are all pressures on the balance between type 1 and type 2 cytokines, tipping the scales towards the latter, and will have the effect of decreasing the defence against cancer and viruses and increase the possibility of developing allergies and asthma. Corrective action can be simple and pleasurable – less fast food and more fruit and vegetables, more walks in the countryside, more laughter and music, less stress and confrontation in the workplace.