Journal of
Ageing and Geriatric Medicine

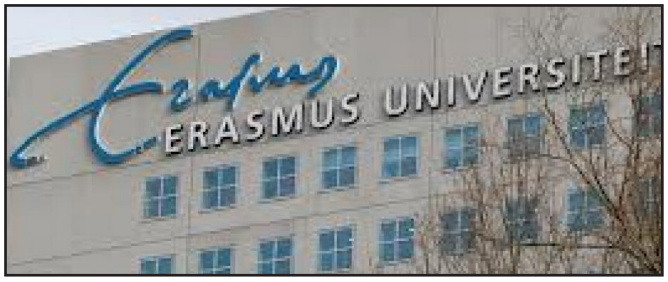
Abstract

Aging immune system (immunosenescence) and the skin

H. Bing Thio,
Department of Dermatology, Erasmus University Medical Centre, Netherlands

Abstract:

A well-established feature of physiological ageing in the skin is an impaired epithelial barrier function. More "danger" signals will then easily enter the skin and quickly be noticed by the innate immune cells in the skin. The functional integrity of the immune system during the natural course of aging is an important issue. There is an accumulating body of evidence that a decline in immune function with age is common to most if not all vertebrates. Almost all of the immune system components undergo an aging-related alteration, thus impacting the innate and adaptive immunity. The age-related decline in the normal functions of immune system is referred to by the specific term "immunosenescence" and is believed to be associated with diminished abilities to induce protective immunity, diminished vaccine efficacy, increased incidence of cancer, autoinflammation and autoimmunity, and the impaired ability to generate tolerance to harmless antigens. The mediators produced by innate immune cells, specific cytokines and chemokines, are increased with increasing age, especially proinflammatory cytokines such as interleukin (IL)-6, IL-1b, TNF-alpha, while the number and the function of the neutrophils are unaltered. On the other hand there is also an increase with age in NK cells. This chronic sub-inflammation, often observed in the elderly is called inflammaging. The gradual weakening of the immune system begins around the age of 60 and gradually deteriorates with age . Age-associated thymic involution seems to occur in all species that possess a thymus. However, the exact order and precise cellular changes that occur between individuals can be diverse, due to differences in environmental exposures and genetic composition. One important potential mechanism underlying immunosenescence includes epigenetic changes such as changes in DNA methylation (DNAm) and DNA hydroxymethylation that occur with age. Ageing is associated with numerous changes in immune cell subsets, antigen-specific cells and cytokines, consistent with an



increasing acquisition of a Th2-cell bias. There is a trend towards a lower Th1 : Th2 ratio. Cell subset analysis consistently demonstrated an increase in Th2 cells in both sexes with increasing age. Decreases in the total number of T cells and naive T cells in males and females in addition to decreases in T helper cells and cytotoxic T cells in males have been observed. This ageing- associated cellular Th2 bias explains why an autoimmune skin disease as bullous pemphigoid and chronic pruritus in the elderly predominantly occur in elderly people. In conclusion, remodelling of the immune system with increasing age, immunosenescence, is characterized by a sort of immunodeficiency, low‐grade chronic systemic (auto)inflammation and increased risk of autoimmunity.

Biography:

Hok Bing Thio, MD, PhD, born 2 April 1960 in Surabaya (Indonesia), is a full-time dermatologist consultant at the Department of Dermatology, Erasmus Medical Centre, Rotterdam, The Netherlands. His PhD thesis (1999) was entitled "Clinical and basic aspects of fumarates in psoriasis", and his main research interests are basic and clinical immunology, particularly the immune-mediated inflammatory diseases (IMIDs) of the skin, psoriasis and atopic dermatitis (AD). Dr Thio has been the principal supervisor/investigator of clinical studies and translational research on psoriasis and AD. Dr Thio has authored and co-authored several papers in peer-reviewed journals.

2nd Webinar on Cosmetology and Trichology, September 04, 2020, London, UK

Citation: Dr.Hok Bing Thio, Aging immune system (immunosenescence) and the skin, Webinar on Cosmetology and Trichology, September 04, 2020