

Ageing of Natural Killer Cells

Natural killer cells

Immunosenescence

Ageing

Innate immunity

The Properties of Natural Killer Cells in the Aged

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The Investigation

A functional immune system is considered a vital necessity for the hosts' continual survival against the daily onslaught of foreign organisms and pathogens. In humans as well as in many other species, it is generally recognised that the immune system decline with age, a term known as immunosenescence, which leads to a higher incidence of infection, neoplastic and autoimmune diseases. Natural killer (NK) cells are specialised lymphocytes that provide a first line of defense through their ability to eliminate pathogen-infected cells and tumors. Thus, it is possible that defects in NK activity could account for the decline in immune function with age and propose that there is an age-dependent impairment in NK activity which is attributed to changes in their phenotype and function.

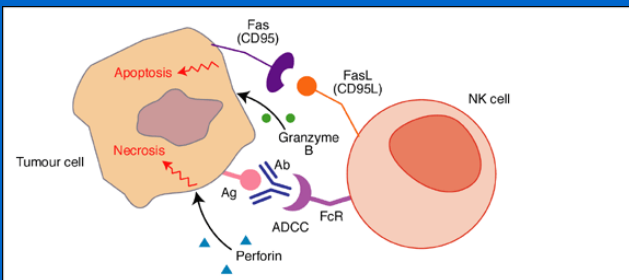


Fig. 1. The functional activities of NK cells in immunity

Objectives

1. To determine the distribution and immunophenotypic characteristics of the NK cell subsets within the peripheral blood from young and older individuals.
2. To determine the functional status of NK cells from young and older individuals.
3. To determine the correlation of telomere length and telomerase activity in NK cells from young and older individuals.

Plan

The phenotype of human NK cells from young and older individuals will be examined by flow cytometry. To determine the association of NK function with age, the cytotoxic activity, cytokine production, together with telomere length and telomerase activity, will be assessed.

Potential Benefits

For older people

Ageing is associated with an increased susceptibility to cancer and infectious diseases, which is attributed to a decline in immunity. NK cells play a central role in the immune system and this study will determine whether they contribute to immunosenescence. Thereby providing a rationale for future therapy with a view of enhancing immune function.

For society

Currently, in the UK more than 18% of the population are 65 years and over, and is expected to rise to 25% by 2031; a trend predicted worldwide. Given, the increased susceptibility to cancers and infections seen in older persons, which is attributed to deficiencies in the immune system, it will of great importance to develop strategies that can increase immunity.

Resources

Post doctoral Fellow for one year

Collaborators

Professor Arne Akbar, University College London

References

Aw, D, Silva AB and Palmer DB 'Immunosenescence: Emerging challenges for an ageing population'. *In Press*



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