بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــســـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

ESTIMATION OF THE LEVELS OF SOME ACUTE PHASE REACTANT PROTEINS IN SENESCENCE

Thesis

Submitted to the Faculty of Medicine,

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TO MY BELOVED FATHER

AND MOTHER

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Chapter (I)

Introduction

INTRODUCTION

Ageing

Ageing can defined as decline in functional capacity with time, resulting from a relative increase in catabolic over anabolic processes of certain tissues or the whole body, consequent of incapability of further cellular reproduction.[1]

Ageing is a natural phenomena, which starts early in the foetus and continues throughout the life and ends with death.[1]

The development, growth, differentiation, ageing and the total span of a cell is genetically programmed through the information in DNA.[1] When the biological and molecular changes of ageing cause reduction of function of certain organ, it is said to exhibit senescence.[2]

Ageing is characterized by the convergence of multiple dysfunction. Elderly persons are more likely to suffer from chronic diseases and disabilities. Also they are vulnerable to social, psychological and economic stresses.[3] So, the first thing is that the geriatric problem is largely a socio-medical one, which will need to be solved in the community.[4]

The biological changes associated with ageing are influenced by hereditary and environmental factors.[5]

Aging process itself, without disease, affects the organs of the body in the following ways:[6]

1- Gradual tissue desiccation.

2- Gradual retardation of cell division, cell growth and tissue repair.

3- Gradual retardation in the rate of tissue oxidation (basal metabolic rate).

4- Cell atrophy, degeneration and increased cell pigmentation.

5- Progressive degeneration of the nervous system, impairment of vision, hearing, memory and mental indurance.

6- Gradual decrease in tissue elasticity and degenerative changes in the elastic connective tissue.

Cellular ageing:

Cellular functions decline progressively with age[7]. Aged mitochondria have a decreased ability to survive a hypoxic insult, also oxidative phosphorylation declines progressively with ageing, as does DNA and RNA synthesis of enzyme proteins and membrane receptors[8]. Senescent cells have a decreased capacity for uptake of nutrients and for repair of chromosomal damage. Concomitantly, there is a steady accumulation of senescent cell component residues in the form of lipofuscin. Other morphologic alterations might be revealed by including irregular and abnormally lobed nuclei, pleomorphic vaculated mitochondria, decreased rough endoplasmic reticulum, vesicular smooth ER, and distorted Golgi apparatus.[8]

Age- related decline in physiologic functions:-

Certain organs, such as the kidneys, lungs, and immune system, develop age- related decline in basal physiologic function.[9] However, the process of ageing in most organ systems is characterized by a reduction in reserve capacity manifested by a blunted and more variable response to increased stimulation. This diminished reserve capacity renders older persons less able to maintain homeostasis when subjected to physiologic stress.

As a consequence of these age- related changes, the elderly are more susceptible to disease and are slow to recover from an injury or disease complication. For example, compared with younger individuals, the elderly are more susceptible to and less able to survive many infectious diseases because of an age – associated decline in their host defense mechanisms, particularly cell- mediated immunity, decreased T-cell number, increased T-suppressor cells, decreased T-helper cells. These same alterations in immune function are also thought to contribute to the higher incidence of cancer seen in the elderly.[9]

Theories of ageing

1-Auto- immune theory:

This is evidenced by the appearance of lymphocytes (immune-workers) and immunoglobulins and also specific antibodies to all body organs. Greying of hair and loss of permenant teeth are of special interest in relation to this theory[1].

Burnet[10] tried to explain this theory by the appearance of altered antigens, so the immune response against the changed cells become possible. Also the mutation within immunocytes can change qualities concerned with tolerance to self components normal to the body, which can give rise to clones with potential autoimmune pathogenicity[10].

The functional capacity of immune system declines with aging. This decline has been attributed primarily to a reduced function of the thymus gland and T-Cells. The thymus begins to involute at adolescence and continues to atrophy throughout the life span.

With thymic involution in aging, there is loss of immune tolerance i.e. the ability to distinguish self from non-self. This, in turn leads to the production of autoimmune antibodies which react with normal cells of the body and destroy them. Thus, ageing would result from loss of immune tolerance with consequent increase of auto-antibody production[11,12].

2-Free radical theory:-

This theory proposed that most ageing changes are due to damage caused by free radicals. Free radicals are molecules that contain one or more "unpaired" electrons which attack other molecules indiscriminately, produce chain reaction, lipid peroxidation and cross linking of molecules including macromolecules like DNA and critically important enzymes. Free radicals are produced in aerobic cells during normal oxidative metabolism.

Most of the free radicals are intercepted by three protective enzymes; super oxide dismutase (SOD), catalase and glutathione peroxidase (GSH). Despite these protective mechanisms products of free radical damage accumulate with time and such accumulation eventually results in impaired cell and organ function. At a young age and in the absence of disease or environmental noxious influences, repair enzymes are capable of repairing this damage. In aging and under toxic conditions, damage is not repaired and may accumulate to compromise cell integrity, inducing aging and other diseases such as cancer, atherosclerosis and dementia[11,13,14].