

The effects of ageing on the human body



The Affects of Ageing on the Human Body The word 'Ageing' does not give a good feeling to most of us because of its associated problems and diseases.

History is replete with the methods and potions used to stave off the effects of ageing ranging from the wooing of young virgins by King David in biblical times to other more modern theories of mega-doses of vitamin E or lamb cell injections, all in the hope of finding the fabled fountain of youth. The number of elderly people as a percentage of the total population is increasing like never before. 10 million people in the UK are over 65 years old. The latest projections are for 5 million more elderly people in 20 years time and the number will have nearly doubled to around 19 million by 2050. Within this total, the number of very old people grows even faster. There are currently three million people aged more than 80 years and this is projected to be almost double by 2030 and reach eight million by 2050. Whilst one-in-six of the UK population is currently aged 65 and over. Clearly, with this expansion of the elderly population within the UK, it is essential for the clinician to be able to differentiate between the normal, age-related, physiological changes in the body's efficiency to that of illness or disease.

The inability to recognise these differences may result in unnecessary testing, misdiagnosis and mismanagement of the elderly person. Ageing, in its broadest sense is the continuous and irreversible decline in the efficiency of various physiological processes once the reproductive phase is over. An individual may experience these changes differently i. e. for some, the level of decline may be rapid and dramatic; for others, the changes are much

more progressive and less significant but all of us will experience levels of the following effects over time, to a greater or lesser degree. The various physiological changes which occur as we age are: Changes in the Vascular system: i. Cardio-vascular: There is normal atrophy of the heart muscle, especially in the more muscular section of the left ventricle.

Hardening of the heart valves, inter artery deposits, loss of elasticity in the artery walls and cardiac arrhythmia due to reduced SA node automaticity all contribute to a reduction in cardiac output. This reduction in blood flow reduces stamina, kidney and liver function and provides less cellular nourishment. The accumulation of cholesterol and calcium on the inside walls of the blood vessels can lead to partial or complete blockage especially in the coronary vessels. The combination of this and the decrease in vessel elasticity raises systolic blood pressure and increases the risk of Angina and/or Thrombosis. Diseases of the heart are the leading cause of death in the elderly within the UK with Coronary Artery Disease (CAD) being the main contributor to this number. The potential for mortality through heart failure is considerably increased beyond the age of 70. ii.

Cerebro-vascular: Plaque formation within the arteries and hardening of the arteries in the vascular system of the brain causes strokes. Prior to the complete occlusion of the blood vessels, the brain is starved of adequate blood flow and oxygenation resulting in ailments such as confusion, disorientation and memory loss. Strokes may result in paralysis, speech disorder and sensory deprivation in varying degrees. Changes in the Respiratory system: The respiratory system undergoes various anatomical, physiological and immunological changes with age. Structural changes due

to normal age related chest wall and thoracic spine deformities impair the total respiratory system function.

Stiffening of the thoracic cage from calcification of the ribs reduces the ability of the thoracic cavity to expand during inspiration and places the diaphragm at a mechanical disadvantage during contraction. This reduction in chest wall compliance impedes the complete emptying of the lungs and results in higher residual volume. This ??? stagnant??™ air left within the alveoli hampers gaseous exchange and can increase the amount of CO₂ in the blood stream causing acidosis. By the age of 75 the volume of air moved during the deepest breathing may amount to only 50% of that noted in young adults.

??? Reduced cilia activity in the airways decreases their ability to remove secretion whilst impaired cough and gag reflexes all contribute to a reduction in the lungs defence mechanisms. This Leads to a greater susceptibility to lower airway infections such as Influenza or Pneumonia, the latter being one of the major causes of death in the elderly. Chronic Obstructive Pulmonary Disease (COPD) affects approximately 10% of the elderly population. COPD includes chronic asthma, emphysema and bronchitis. A history of tobacco use combined with a loss of elasticity in the lung tissue and the previously mentioned reduction in the lungs defence mechanisms all make the elderly patient susceptible to COPD. Changes in the Musculoskeletal system: There is generalised atrophy of all muscles, accompanied by a replacement of muscle tissue with fat deposits resulting in a reduction in both muscle tone and strength. Some poignant implications of this are the reduced ability to breathe deeply.

This in itself can hamper the recovery of patients suffering from cardiovascular disorders, respiratory malfunction or trauma. Calcium is lost and bones become less dense especially in post menopausal women. This can result in Osteoporosis and a reduction in the weight bearing capacity of the skeleton. The risk of bone fracture in the elderly during relatively minor falls is common place with an increased risk of spontaneous fracture in advanced Osteoporosis. Narrowing of the inter- vertebral discs and compression fractures in the spinal vertebrae contribute to a reduction in height and postural changes. The joints also undergo changes, deteriorating with age losing their flexibility and becoming arthritic.

In fact arthritis and degenerative inflammation of the joints are one of the most common chronic conditions of the elderly. Changes in the Skin: The skin loses underlying fat layers and oil glands, causing wrinkles and reduced elasticity. The skin becomes somewhat less sensitive to sensations therefore, increasing susceptibility to heat, cold and bruising injuries. Changes in the Gastrointestinal and Renal systems: There is a reduction in the production of stomach acid, digestive enzymes and saliva.

These changes may result in gastrointestinal distress (constipation and abdominal pain), impaired swallowing and delayed emptying of the stomach and bowels. Reduced blood flow to the tissue that connects the stomach and intestines to the abdominal wall slow and reduce the body's ability to extract nutrients from digested food, leading to deficiencies in vitamin B, C and K or in extreme cases malnutrition. The body's generalised reduction in cardiac output and blood flow reduces the organ mass of the kidneys by up to 20% reducing their filtration function by up to 50% between the ages

of 25 and 90 years. ??? Ageing kidneys respond more slowly to changes in blood pressure and fluid/electrolyte imbalances. In men, the prostate gland tends to enlarge. In many men, it enlarges enough to interfere with the passage of urine and to prevent the bladder from emptying completely. As a result, older men tend to urinate with less force, to take longer to start the stream of urine and to urinate more often. Older men are also more likely to be unable to urinate despite having a full bladder.

Changes in the Endocrine system: The levels and activity of some hormones produced by endocrine glands gradually decrease. Growth hormone levels decrease, leading to decreased muscle mass. Aldosterone levels decrease, making dehydration more likely. This hormone signals the body to retain salt and therefore water. Insulin, which helps control the sugar level in blood, is less effective, and less insulin may be produced. Insulin enables sugar to move from the blood into cells, where it can be converted to energy.

The changes in insulin mean that the sugar level increases more after a large meal and takes longer to return to normal. For most people, the changes in the endocrine system have no noticeable effect on overall health. But in some, the changes may increase the risk of health problems. For example, the changes in insulin increase the risk of type 2 diabetes. Blood Production: The amount of active bone marrow, where blood cells are produced, decreases.

Therefore, fewer blood cells are produced. Nonetheless, the bone marrow can usually produce enough blood cells throughout life. Problems may occur

when the need for blood cells is greatly increased??” for example, when anaemia or an infection develops or bleeding occurs.

In such cases, bone marrow is less able to increase its production of blood cells in response to the bodys needs. Changes in the Nervous System: As the nervous system ages, signal conduction slows, but much more so at the nerve synapses than the nerve cells themselves. Nerve cells may begin to transmit messages more slowly than in the past. Waste products can collect in the brain tissue as nerve cells break down, causing abnormal structures called plaques and tangles to form. Some slight slowing of thought, memory, and thinking is a normal part of aging.

Although these changes are natural, many people have misconceptions about the type and extent of these changes. A common misunderstanding is that all elderly people become senile. Many people blame increased confusion on “ getting old” when it may really be caused by an illness. These changes are not the same in everyone. Some people have many physical changes in their nerves and brain tissue, others have few changes. Some people will have atrophy and plaques, some will have plaques and tangles, and some will have other changes. Plaques and tangles are associated with Alzheimers disease which causes dementia. Dementia and severe memory loss are NOT normal processes of aging.

They are caused by degenerative brain disorders such as Alzheimers disease. Delirium can often be confused with dementia but is more likely due to illnesses that are not related to the brain, which can also cause changes in thinking and behavior. For example, almost any infection can cause an older

person to become severely confused. A poorly controlled blood sugar level in people with diabetes is another common cause of temporary difficulties with thinking and behavior. Functioning of the peripheral nervous system also slows with age. We lose taste buds, olfactory cells (sense of smell) and nerve endings in the skin. The more noticeable changes associated with ageing are:

- i. Changes in vision: In the fourth decade, the pupil begins to decrease in size and there is decreased response to light.

Because of these changes, older people require up to three times the illumination to see as compared to a younger person. Focusing takes longer with an increase in nearsightedness, making small print harder to read. There is thickening and yellowing of the lens of the eye. This results in light diffraction, increased sensitivity to glare, a decrease in depth perception and more difficulty in distinguishing some colours.??? ii.

Changes in hearing: There is a decrease in sensitivity to high frequency tones and decreased discrimination of similar pitches due to changes in the bone structure and cochlear hair cells of the inner ear. Approximately 30% of all elderly persons have some hearing impairment.??? It is an invisible disability which is often denied by the person who may be then misdiagnosed as senile and/or uncooperative. This paper has examined the Physiological changes in the body. There are additional clinical and psychological conditions that can happen with ageing and can affect the health and wellbeing of us all as we age. A less active lifestyle, constant chronic conditions with numerous medications and a general degradation in the quality of life can lead to depression in the elderly. Depression affects

approximately 6% of the population over the age of 65 and is associated with a higher suicide rate than that of any other age group.

??? References: 1. Cracknell R. House of Commons library research.

2011. [http://www.parliament.](http://www.parliament.uk/documents/commons/lib/research/key_issues/Key%20Issues%20The%20ageing%20population2007.pdf)

[uk/documents/commons/lib/research/key_issues/Key%20Issues%20The%20ageing%20population2007.pdf](http://www.parliament.uk/documents/commons/lib/research/key_issues/Key%20Issues%20The%20ageing%20population2007.pdf) 2. Balcombe NR, Sinclair A.

Ageing: definitions, mechanisms and the magnitude of the problem. 2001. 3.

Coroline N. Emergency care in the streets, 6th Ed. 2008 4.

Jaul E. The importance of increasing awareness of hearing and vision in the elderly population. 2006