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Mahima Rana
 Research Scholar, Faculty of
 Home Science Banasthali
 University, Rajasthan, India

Gita Bisla
 Associate Professor, Faculty of
 Home Science Banasthali
 University, Rajasthan, India

Age associated physiological changes and their relationship to different health problems among women

Mahima Rana and Gita Bisla

Abstract

A group of processes that take place in living organisms from birth to death called aging, and this process linked with functional, structural and morphological alterations. These changes arise at the whole-body level, cellular level, and the tissue level. In the human body, there are many physical changes specifically seen at every stage of life. Although every person experiences a unique pattern of growth and development but during early stages of life these changes are known as growth and development. These changes affect inner permanence and enhance the risk of many universal unrelieved and aging-associated diseases, including, respiratory diseases, type 2 diabetes mellitus, and cardiovascular disease, several types of cancer, Alzheimer's disease and osteoporosis, arthritis, hormonal changes, nervous system changes. Changes in body composition also include in aging process.

Keywords: aging, anthropometric changes, different health problems, obesity, cardiovascular disease, hypertension, diabetes, atherosclerosis, osteoporosis, arthritis, hormonal changes

Introduction

Aging is commonly defined as the accumulation of diverse deleterious changes occurring in cells and tissues with advancing age that are responsible for the increased risk of disease and death. The major theories of aging are all specific of a particular cause of aging, providing useful and important insights for the understanding of age-related physiological changes. However, a global view of them is needed when debating of a process which is still obscure in some of its aspects. In this context, the search for a single cause of aging has recently been replaced by the view of aging as an extremely complex, multifactorial process (Tosato *et al*, 2007) [1].

Aging involves a group of processes that occur in living organisms, and it is associated with morphological, structural and functional alterations. These changes occur at the cellular level, the tissue level and the whole-body level. They affect internal stability and increase the risk of many common chronic and aging-associated diseases, including diabetes mellitus type 2, cardiovascular disease, respiratory diseases, osteoporosis, arthritis and Alzheimer's disease, (Gaba *et al*, 2014) [2].

Obesity

A good nutritional status of a woman has important for her health and health of her children too. In comparison men and women, the essential fat level is higher in women as it includes sex-characteristic and issues linked to fat during child bearing. (Kulie *et al*, 2011) [3].

High body fat is called obesity which is a pathological situation with overload or excess body fat. It is a chronic disorder having complex interaction between environmental and genetic factors. It is associated by high cholesterol, fatty acid levels, high blood pressure and insulin desensitization (Gupta *et al*, 2011).

Obesity is one of the most widespread problems all over the world. About 25% of children and 40-60% of adults in all developed countries suffer from the excess weight which causes physiological and psychological changes of the body, as well as serious health problems (Lobstein *et al*, 2004) [5].

The incidence of obesity is higher (39.4%) among middle age adults between 40 years to 59 years, than lower (32.0%). Fat can subcutaneous or visceral according to its location.

Correspondence
Mahima Rana
 Research scholar, Faculty of
 Home Science Banasthali
 University, Rajasthan, India

The saturated fat is linked with the primitive fat around the middle body section, which may hamper with the proper functioning of vital organs. There is an association between specific fat deposits and overall fat deposits. For degenerative diseases, abdominal fat is most correlated factor (Das *et al*, 2012) [3].

The prevalence of obesity among younger women has been found to be lower in comparison of middle aged or older women (Kulie *et al*, 2011) [3]. In the years surrounding menopause, women are particularly vulnerable to weight gain (Thompson *et al*, 2004) [7]. In many ways, obesity negatively affects on the health of women which enhances the relative risk of coronary artery diseases, diabetes, and higher risk of multiple cancers, including breast cancer and endometrial cancer (Kulie *et al*, 2011) [3]. With increased age, incidence of obesity makes a complicating relationship between muscle mass, weight changes and decreasing strength (Chan and Woo, 2010) [8].

As the populations of most developed countries continue to become older, on average, the importance of aging as a risk factor for all cardiovascular disease increases.

Cardiovascular diseases

Cardiovascular diseases are non-communicable diseases having a major share of incidences which have been leading cause of morbidity and mortality. In India, females of urban population are more prone to cardiovascular diseases (CVD's). Recent trends declare that the prevalence of these diseases has also occurred into younger age groups (Chauhan & Aeri, 2013) [10].

The burgeoning burden of CHD in public of India may be explained by the horrifying rise within the prevalence of coronary risk factors like polygenic disease, high blood pressure, atherogenic dyslipidemia, smoking, central fatness and physical inactivity. Speedy urbanization and alter in life style that occurred throughout the past twenty years have lead to the growing burden of coronary risk factors in Republic of India. Previous studies conducted in migrant Indians were misinterpreted to point that standard risk factors don't account for the high prevalence and premature incidence of CHD among Indians. Generally women's area unit less doubtless to urge cardiopathy till change of life. It's believed that steroid hormone provides protection to the guts till natural change of life however once change of life risk will increase. By the age of sixty to sixty five years, girls and men have identical risk of heart disease" (depts.washington.edu/uwcoe/health topics/cardio.html).

The burgeoning burden of CHD in Asian nation will be explained by the alarming rise within the prevalence of coronary risk factors like polygenic illness, vessel illness, atherogenic dyslipidemia, smoking, central fat and physical inactivity. Fast urbanization and alter in mode that occurred throughout the past 20 years have junction rectifier to the growing burden of coronary risk factors in Asian nation. Previous studies conducted in migrant Indians were misinterpreted to point that standard risk factors don't account for the high prevalence and premature incidence of CHD among Indians. Generally ladies square measure less seemingly to urge cardiovascular disease till climacteric. It's believed that steroid hormone provides protection to the center till natural climacteric however once climacteric risk will increase. By the age of sixty to sixty five years, ladies and men have an equivalent risk of heart disease" (depts.washington.edu/uwcoe/health topics/cardio.html).

The Global Burden of illness Study has reportable that

ischemic cardiopathy and stroke area unit foremost necessary causes of death and years of life lost and one in every of the foremost necessary causes of incapacity and mortality in girls. It's reportable that vessel diseases (CVD) because the most significant reason for death in women. Over ten million deaths annually in public of India, nearly two million area unit as a result of diseases of vascular system, of that forty per cent area unit girls. Among girls, these diseases area unit the main reason for death, within the time of life, in urban and in rural girls living in poor or made States. Over 1/2 the 800,000 annual CVD deaths in girls occur untimely (Gupta, 2013) [12]. "There area unit variety of structural and purposeful changes within the heart with aging and every of those will have important implications for upset. Structurally, there's a major increase in heart muscle thickness as a results of raised cardiomyocyte size. Additionally, the gut changes its overall form from elliptical to ellipsoid of revolution with an uneven increase within the inter ventricular septum over the free wall. These changes in thickness and form have necessary implications for internal organ wall stress and overall contracted efficiency" (Strait *et al*, 2012) [13].

Atherosclerosis

Atherosclerosis may be an illness of enormous and medium-sized muscular arteries and is characterized by epithelium disfunction, vascular inflammation and also the build-up of lipids, cholesterin, metallic element and cellular scrap inside the membrane of the vessel wall. This build up leads to plaque formation, vascular reworking, acute and chronic sodium thiopental obstruction, abnormalities of blood flow and diminished element of fertto focus on organs (Babu *et al*, 2015) [14].

As age advances, the severity of coronary artery disease is additionally raised and this might result in overtime if the overall artery is concerned once the lumen is blocked. As age advances coronary artery disease and sophisticated lesions area unit gift within the middle and older age teams. Important lesions area unit seen in those had history of diabetes mellitus and high blood pressure. The proportion of coronary artery disease is found to extend with age, being lowest in 10-19 years people (78.6%) and highest in sixty year's people (100.0%) (Babu *et al*, 2015) [14].

Osteoporosis

It's an illness within which bones area unit additional fragile and have less density, thus, there's a high risk of fracture. It's commonest in women once change of life between the ages of forty five to fifty five years. Bone mass of women begins to lose faster compared of men and this mass is usually less additionally than that of men. Once change of life, girls turn out abundant less of the steroid hormone| and this hormone build the bone sturdy (www.med.umich.edu/1info/FHP/.../osteoporosis/Osteoporosi sInWome).

"Osteoporosis is characterized by a deficiency of bone tissue relative to the quantity of anatomical bone. This reduced density will increase condition to fracture. Such a discount reflects either the inadequate accumulation of bone tissue throughout skeletal growth and consolidation, excessive losses thenceforth, or both. Pathology is additional common clinical downside in Republic of India and in throughout the world. Majority of the post-menopausal women's and aged population area unit affected. Pathology is that the decrease in bone mass is as a result of activation of osteoclasts, which reinforces bone biological process. Biological time pathology

is that the commonest primary sort and is characterized by speedy bone loss in recently biological time girls and since there are not any safe, effective ways in which to build, the osteoporotic skeleton, hindrance by maximizing bone mass throughout skeletal growth and by development and minimizing biological time bone losses” (Nikose *et al*, 2015). “The properties of bones don't stay constant with age; rather, they modify throughout life, in some cases rising in operate, however in others, operate deteriorates (Boskey *et al*, 2010)^[8] Osteoporosis and degenerative joint illness taciturnly progressing metabolic bone disease is wide rife in Republic of India and may be a common reason for morbidity and mortality in women's. Low metallic element diet and lack of health awareness area major causes behind this pathological state. Public of India has high maternal mortality quantitative relation. Consistent with National Family Health Survey (NFHS) conducted in 1992-93, within the four years preceding the survey thirty seventh of all the pregnant girls in Republic of India received no prenatal care throughout pregnancies” (<https://www.slideshare.net/theicrd/ppt-womens-health-aws-2015colombo>).

Arthritis

The term "arthritis" describes several conditions (there square measure some one hundred) that have an effect on the joints, the tissues encompassing the joints and different connective tissues. What every kind of inflammatory disease has in common is joint and contractile organ pain that, within the most severe cases, will greatly have an effect on the standard of life. The foremost common styles of inflammatory disease square measure degenerative arthritis and rheumatism. Inflammatory disease affects a bigger proportion of females all told age teams. Its prevalence is expected to rise because the population ages.

People who square measure overweight or rotund square measure additional seemingly to have inflammatory disease than those of traditional weight. In 2009, among women's aged forty five to sixty, the prevalence of inflammatory disease was thirty ninth for those that were rotund, twenty sixth for those that were overweight and 16 % for those with a standard weight Among seniors, the proportion of women's diagnosed with inflammatory disease was sixty one for rotund women, compared with fifty two for overweight women's and forty two for those with a standard weight (<https://www.statcan.gc.ca/pub/89-503-x/2010001/article/11543-eng>).

“Rheumatoid arthritis, an inflammatory disease of unknown etiology that occurs in about 1-2% of the adult population, is an autoimmune disease in which a person's immune system which normally protects the body from infection & disease attacks the joint tissues & is commonly associated with chrome inflammation of joints. There are many risk factors associated with rheumatoid arthritis & one of them is gender Studies have reported that women are three times more likely than men to have rheumatoid arthritis & they have more severe rheumatoid arthritis symptoms than men(<https://my.clevelandclinic.org/health/diseases/4924-rheumatoid-arthritis>).

Arthritis is one of the diseases which are very common in female population. 60 per cent of all people who have arthritis are female. The term arthritis means joint pain associated with swelling. There are a lot of genetic, environmental and other factors like which makes an individual prone to arthritis. It triggers changes in immune system which in turn affect joint and cause arthritis which leads to joint damage and

complicate the lifestyle. It is a myth that arthritis is a disease of old age. It can happen at any age even during childhood. Females can develop arthritis even when they are in their thirties” (pharmabiz.com › News).

Hypertension

The prevalence of cardiovascular disease has exaggerated over the last decade. Essential cardiovascular disease high blood pressure accounts for quite ninetieth of cases of hypertension. During a recent review; the period risk of changing into hypertensive in industrialized countries was calculable to exceed ninetieth. In pressure levels, the gender distinction seems throughout adolescence however a transfer in relative prevalence of cardiovascular disease happens within the aged (Chan *et al*, 2010)^[8]. As compared with age-matched men, biological time girls have lower risk however this advantage for women's step by step disappears once climacteric. The next proportion of women's as compared with men, have cardiovascular disease. Once sixty five years elderly, and also the gap can in all probability increase with the continuing aging of the feminine population (Gudmundsdottir *et al*, 2012)

Between the ages of sixty five and seventy four years, the prevalence of cardiovascular disease is as high as fifty eight in women's. Hypertension may be a chief risk issue for the first development of heart condition, stroke, and heart and nephropathy. as compared with normotensive people, the danger of a attack or nephropathy will increase four-fold in people with general blood vessel cardiovascular disease (SAH>160 mmHg); and also the risk of heart condition doubles once forty years elderly (Yang *et al*, 2011).

The prevalence of hypertension has increased over the last decade. Essential hypertension accounts for more than 90% of cases of hypertension. In a recent review; the lifetime risk of becoming hypertensive in industrialized countries was estimated to exceed 90%. In blood pressure levels, the gender difference appears during adolescence but a transfer in relative prevalence of hypertension occurs in the elderly (Chan *et al* 2010)^[8]. In comparison with age-matched men, premenopausal women have lower risk but this advantage for women gradually disappears after menopause. A higher percentage of women in comparison with men, have hypertension after 65 years of age, and the gap will probably increase with the continued aging of the female population (Gudmundsdottir *et al*, 2012)

Between the ages of 65 and 74 years, the prevalence of hypertension is as high as 58% in women. “Hypertension is a chief risk factor for the early development of heart disease, stroke, and heart and kidney failure. In comparison with normotensive individuals, the risk of a heart attack or kidney failure increases four-fold in individuals with systemic arterial hypertension (SAH>160 mmHg); and the risk of heart failure doubles after 40 years of age (Yang *et al*, 2011).

Basically, this high prevalence of cardiovascular disease may be a development that's a part of the ageing method in people of each sex (Taddei S, 2009). Blubber is additionally a major risk think about the pathological process of blood vessel cardiovascular disease. There's the extra result of the steroid depletion that happens at climacteric among women's (Yang *et al*, 2011).

Hypertension is the attributable cause for 57% of stroke and 24% of coronary heart disease deaths in India. High prevalence of hypertension has been reported from various regions of the country”. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart

disease (CHD) deaths in India.

High pressure is that the main risk issue for stroke and it contributes to the danger of attack and nephropathy. Also, high pressure will scale back the diameter of arteries and block them. It may also exert pressure on organs and weaken them. In 2009, some 2.5 million females aged twelve and over (17%) reported being diagnosed with high pressure in india (<https://www.statcan.gc.ca/pub/89-503-x/2010001/article/11543-eng.htm>)

Diabetes

“Diabetes develops when the body does not produce enough insulin or does not effectively use the insulin it produces. Diabetes can adversely affect quality of life or lead to complications such as heart disease, stroke and kidney disease. It has been shown that diabetes is highly correlated with income level for women, but not for men. Before age 45, diabetes is not common, and its prevalence differs little between women and men. However, among seniors, women are proportionally less likely than men to be diabetic. In 2009, 15% of women aged 65 and over reported having diabetes, compared with 22% of men.

The number of diagnosed cases of diabetes and the prevalence of this disease are increasing, for both women and men. The increase in obesity explains in part the greater prevalence of diabetes. Among obese women aged 65 and over, the proportion with diabetes was 29% in 2009, compared with only 13% of those who were overweight and 9% of those who were of normal weight (results not shown). By comparison, 37% of obese men aged 65 and over had diabetes, as did 16% of those who were of normal weight. In general, obesity is more strongly associated with the development of diabetes problems for women than for men” (<https://www.statcan.gc.ca/pub/89-503-x/2010001/article/11543-eng.htm>).

Hormonal changes

Hormonal changes happen in the body of a 40 year old woman. Forties most of the females likely to hit perimenopause, the start of menopause. This phase has the ability to bring along a host of physical, emotional, psychological changes. The decline in body's estrogen levels can bring forth marked changes like irregularity in menstrual periods, irritability, sleep problems, depression etc. These hormonal changes also effect fluctuations in weight. Basic metabolism continues to slow during the transition to menopause and body weight gradually shifts from your hips and thighs to your abdomen, shoulders and chest.

The levels and activity of some hormones, created by endocrine glands. Endocrine levels decrease, resulting in attenuated muscle mass. Mineral corticoid levels decrease, creating dehydration additional seemingly.

This endocrine signals the body to retain salt and water. Insulin, that helps management the sugar level in blood, is a smaller amount effective, and less insulin may be created. Insulin enables sugar to maneuver from the blood into cells, wherever it is reborn to energy. The changes in insulin mean that the sugar level will increase additional once an oversized meal and takes longer to come to normal (www.merckmanuals.com › Home › Older People's Health problems › The Aging Body).

The most common consequence of aging-related secretion changes is menopause. Around age fifty, women's ovaries begin manufacturing decreasing amounts of steroid sex hormone and progesterone; the endocrine tries to

compensate by manufacturing additional vesicle stimulating hormone (FSH). While climacteric is traditional and happens to all or any girls, a number of the symptoms are irritating or maybe dangerous. Hot flashes, Insomnia, Irritability, Depression, Osteoporosis that will increase the probability of bone fractures.

Anemia

Anaemia is that the commonest biological process deficiency disorder within the world. It's a condition that happens once the red blood cells don't carry enough elements to the tissues of the body. United Nations agency defines anemia as a condition within which the hemoglobin (Hb) content of blood is less than conventional as a results of deficiency of one or additional essential nutrients, in spite of the reason for such deficiencies. Most of the anemia's square measure thanks to inadequate offer of nutrients like iron, B-complex vitamin and cobalamin, proteins, amino acids, vitamins A, C, and different vitamins of B-complex cluster i.e., B and vitamin B complex are concerned within the maintenance of hemoglobin level. Globally, anemia affects 1.62 billion folks, which correspond to 24.8% of the population. (Kaur *et al*, 2014) ^[20].

“The highest prevalence is in preschool-age children (47.4%), and the lowest prevalence is in men (12.7%). However, the population group with the greatest number of individuals affected is pregnant women (41.8%). In women, anemia may become the underlying cause of maternal mortality and perinatal mortality. Nearly 50 per cent of women of reproductive age and 26 per cent of men in the age group of 15-59 years are anemic. WHO has estimated that prevalence of anemia in developed and developing countries, in pregnant women are 14 per cent in developed and 51 per cent in developing countries and 65-75 percent in India alone”. Prevalence of anemia in South Asian countries is among the highest in the world (Kaur *et al*, 2014) ^[20].

Changes in nervous system

Aging is a process that is often accompanied by physiological changes. These physiological changes include slowing in muscle contractility, alteration in muscle metabolism and neuromuscular junction, and reduction in nerve conduction velocity (NCV). Age has been widely accepted to have an influence on nerve velocity. It is well established that there is a decline in muscular performance with advancing age. Nerve conduction studies (NCS) are the most sensitive and reproducible measure of peripheral nerve functions (Jagga *et al*, 2011).

“With aging your brain and nervous system go through natural changes. Brain and spinal cord lose nerve cells and weight (atrophy). Nerve cells may begin to pass messages more slowly than in the past. Waste products can collect in the brain tissue as nerve cells break down. This can cause abnormal changes in the brain called plaques and tangles to form. A fatty brown pigment (Lipofuscin) can also build up in nerve tissue. Breakdown of nerves can affect senses. Aging reduces reflexes or sensation. This leads to problems with movement and safety. Slowing of thought, memory, and thinking is a normal part of aging. These changes are not the same in everyone. Some people have many changes in their nerves and brain tissue. These changes are not always related to the effects on your ability to think. It has been widely found that the volume of the brain and/or its weight declines with age at a rate of around 5% per decade after age 40” (Peters R, 2006) ^[22].

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