



Peculiarities of Ocular and Systemic Pathology in the Elderly

Dumitrache Marieta¹, Lascu Rodica^{2*}

¹Department of Ophthalmology, Carol Davila University of Medicine and Pharmacy, București, Romania

²Misan Med Clinic, Sibiu, Romania

*Corresponding Author: Lascu Rodica, MD, PhD, Misan Med Clinic, Sibiu, Romania;
Email: lascughrodica@yahoo.com

Received Date: 24-06-2022; Accepted Date: 28-07-2022; Published Date: 05-08-2022

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Abstract

The pathology of the elderly is the direct result of the aging process, aggravated by the physical and mental involution that occurs with advancing age. Age-related eye changes are present, such as: presbyopia, decreased tears, peripheral visual field reduction, vitreous liquefaction (with posterior vitreous detachment and retinal detachment), decreased vision due to cataracts, glaucoma, diabetic retinopathy, macular lesions, Age-Related Macular Degeneration (AMD), optic atrophy. At the same time, there are multiple systemic diseases in the elderly, at the cardiovascular, respiratory, locomotor, neurological, auditory level. The diseases of the elderly can be multiple, with a long, chronic evolution, with periods of exacerbation, frequent complications, prolonged convalescence. Aging is a continuous, dynamic process that must be followed because in its evolution new connections and balances are created that must be identified and treated properly, old age being a distinct stage of ontogenesis that should not be seen as a state of disease. In an elderly patient, the normal aging should be differentiated from pathology.

Keywords

Elderly; Cataract; Glaucoma; Aging; AMD

Introduction

The current growth of the elderly human population generates a specific pathology, with multiple clinical aspects.

The pathology of the elderly includes an accumulation of irreversible diseases, which lead to medical and psychosocial dysfunctions, in the end the elderly being physically, psychosocially, spiritually dependent.

The World Health Organization (WHO) estimates that in 2050 the population over the age of 60 will double, with increasing frequency of disability (or even death) due to cardiovascular disease, malignancies, mental illness, but also increasing the frequency of eye disease [1].

The pathology of the elderly is the direct result of the aging process, aggravated by the natural physical and mental involution parallel to the advancing age.

Eye and Systemic Changes in the Elderly

- Inevitable age-related eye changes that occur in the evolution of each individual
 - Presbyopia occurs after the age of 40 and is generated by the decrease of the lens accommodation, by decreasing its elasticity
 - The size of the pupil is reduced, the patient needing ambient light three times stronger
 - Decrease in the amount of tears, which can cause dry eyes with eye discomfort
 - Decrease of the peripheral dimensions of the visual field (requires caution when driving)
 - The vitreous body liquefies and in severe forms is accompanied by posterior vitreous detachment and retinal detachment
- Eye diseases in the elderly are multiple and many of them are disabling, some of them existing before aging, aggravated in their age-related evolution and/or the presence of degenerative diseases specific to the elderly [2,3]
 - Degenerative maculopathy, which affects the central area of the retina, is accompanied in time by the decrease / loss of vision in people over 60 years (possible family history)
 - Diabetic retinopathy in types 1,2 diabetes may be accompanied by vision loss due to proliferative retinopathy
 - Senile cataract affects unilaterally / bilaterally the elderly patient and requires surgical resolution at the time of the installation of visual discomfort
 - Open-angle glaucoma, which begins in adulthood, can progress to decompensation with vision loss.

Knowing the ocular pathology in the elderly, it is important to inform the patient of the possible involution of the eyes and the need for periodic ophthalmological control and to recommend emergency ophthalmic medical addressability if the following are installed

- Double vision, even temporarily
- Loss of uni / bilateral vision, temporarily/permanently
- Sudden presence of bright spots, distorted vision
- Pain and red eyes

The Systemic Conditions Present in the Elderly are Multiple [1]

- Cardiovascular diseases in the elderly are a common cause of disease with even fatal consequences and require permanent diagnosis, clinical and therapeutic follow-up
- Type 2 diabetes caused by the inability to use insulin effectively (triggered by obesity, sedentary lifestyle, unhealthy lifestyle) should be monitored constantly to avoid the serious complications it can cause
- Stroke (if the patient survives) may be followed by severe motor deficits, language, mental, behavioural disorders
- Depression in the elderly is common and has different clinical manifestations
- Dementia is a serious condition, which is accompanied by the progressive loss of cognitive abilities and then the patient needs constant supervision, because drug therapy, which may be useful in the early forms of the disease, becomes ineffective in advanced forms of the disease
- Breast, prostate, lung, colon cancer can affect the elderly and has a varied clinical course.
- Other diseases of the elderly are multiple, intricate and can worsen over time: obesity, osteoarthritis, fractures (hip), hearing loss, venous thromboembolism
- The comorbidities of the elderly, some with the risk of imminent death, are a continuous, involutive process, with an inevitable evolution towards physical and psycho-social decompensation
- Old age in all its dimensions: medical, economic, demographic, cultural is an important social problem, in which the elderly patient needs supervision, regular medical check-up, care, empathy within the family or in specialized institutions

Materials and Methods

200 patients were included in the study - 60% women, 40% men, aged between 60-85 years, unselected and followed in the ophthalmology ward.

Ocular and systemic pathology was followed clinically and periodic check-up was performed.

The physiological reduction of vision in presbyopia was confirmed by clinical follow-up of emmetropic patients without eye diseases.

The morbidity due to eye diseases in the studied group was (Fig. 1):

1. Cataract - 35%
2. Open-angle glaucoma - 15%
3. Macular lesions with age-related macular degeneration - ARMD - 12%
4. Diabetic retinopathy - 8%

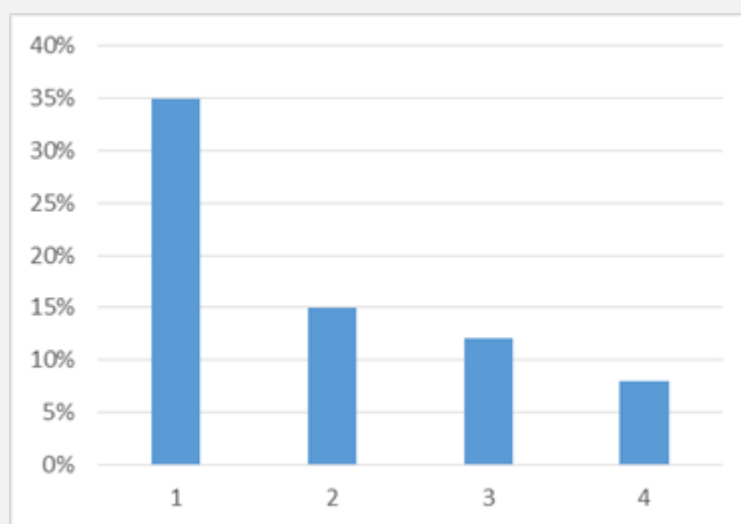


Figure 1: Morbidity for eye diseases.

From the studied group, 40% of the patients presented physical and/or cognitive comorbidities that contributed to the accentuation of the visual deficit parallel to the systemic dysfunctions, aggravated with the age of the patient and the ocular and general evolutionary pathology.

The elderly patient has a multiple and varied systemic pathology, with diseases with chronic evolution, associated complications, prolonged convalescence accentuated with age and with the decompensation of the pathology, elements present in the clinical study carried out in 70% of the patients.

It was found that the visual deficit worsened with age in 85% of the patients, simultaneously with the decrease in vision due to eye pathology, associated with the decrease in visual perception in individuals with systemic pathology.

In the studied group, patients with or without eye pathology presented a variable percentage of pre-existing systemic diseases or diseases that appeared during the clinical follow-up, the general pathology being accentuated with age in a percentage of 65%.

Depending on age, the patients presented (Fig. 2):

- 60-70 years -

1. Cardiovascular diseases: hypertension, atherosclerosis - 35%
2. Respiratory system diseases: chronic obstructive bronchopathy - 15%
3. Damage to the locomotor system - 20%
4. Eye diseases: cataract, glaucoma, ARMD, diabetic retinopathy - 25%
5. Neurological diseases - 5%
6. Minor cognitive disorders - 10%
7. Major cognitive disorders - 2%

- 70-85 years -

1. Cardiovascular diseases - 75%
2. Respiratory diseases - 40%
3. Damage to the locomotor system - 45%
4. Eye diseases - 40%
5. Neurological sequelae (stroke) - 15%
6. Minor cognitive disorders - 25%
7. Major cognitive disorders - 16%

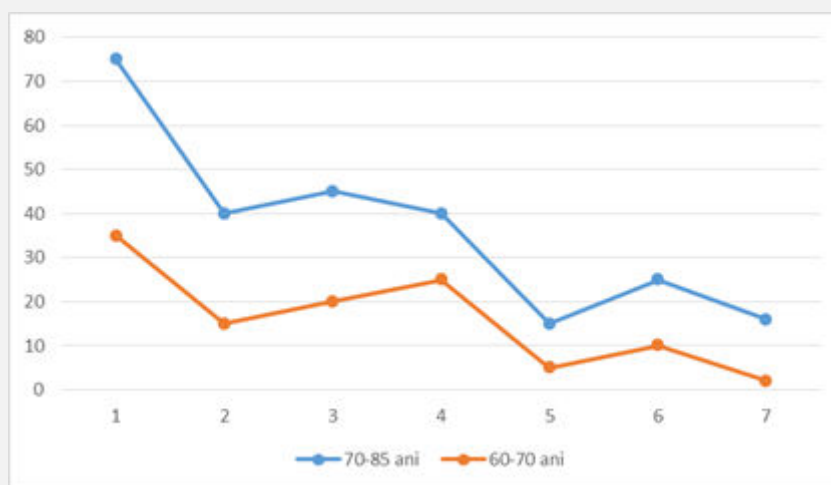


Figure 2: Patients record chart, depending on age.

Aging is inevitable, but the rate of aging is different, in various patients an accentuation of progressive ocular and systemic deficits is observed with age, with multi-functional degradation confirmed in most of the followed cases.

In this study, it was found that other diseases present in the elderly patient: obesity, arthrosis, fractures can aggravate the unfavorable evolution of the aging process.

Rodica L | Volume 3; Issue 2 (2022) | JOAR-3(2)-0039 | Research Article

Citation: Rodica L, et al. Peculiarities of Ocular and Systemic Pathology in the Elderly. J Ophthalmol Adv Res. 2022;3(2):1-11.

DOI: <https://doi.org/10.46889/JOAR.2022.3206>

The organic changes produced by aging are variable from one individual to another and are associated with personal or environmental psychosocial problems.

Of the study group, people over 75 years of age presented 15% of major medical and psychosocial dysfunctions, of whom 22% were physically and/or psychosocially dependent.

Discussion

The biological process of physiological aging is a process of destructive involution of the organism with an inexorable final evolution towards a terminal state.

Age has a severe impact on vision, with age there is a variable (but real) decrease in visual acuity, generated by the normal aging process, but also by the evolution of eye diseases and / or general diseases:

- Visual impairment can cause difficulties in daily activity, for reading, TV watching, traveling
- Decreased peripheral visual field creates difficulties in detecting obstacles while walking
- Macular paracentral scotoma affects the patient's current visual comfort
- Adaptation problems occur, affecting vision at night or when the lighting is dimmed

The normal involution process in the elderly is aggravated by new or old diseases that amplify the aging process, the boundary between physiological aging and pathological aging being difficult to establish.

The normal progressive-regressive physiological aging modifies the balance of the morphofunctional parameters, a situation accentuated by the appearance of some added diseases, specific to the elderly, or by the aggravation of the pre-existing ones [4].

Molecular or cellular aging is a slow and passive process, probably programmed, aggravated by various internal and external factors, but also variables.

- With age, morphological and functional changes occur in the anatomophysiological structures of the body
- General aging of the body (and the eye in particular) is caused by multiple interrelated factors
- The individual genetic component
- Degenerative changes at the cellular level with accumulations of free radicals and other products of metabolic degradation
- Immunological changes in the elderly with reduced ability of the immune system to produce antibodies (quantitatively and qualitatively)

- The influence of external factors: radiation, heavy metals, stress, amino acids and isomeric sugars in the diet
- The appearance of cross linkage in the intra and extracellular molecular structures under the action of internal, external, metabolic intra and extracellular factors

Factors that influence aging [1,2,4]

- Genetic factors determine the longevity of the individual, man being genetically programmed to live 110-120 years.
- Non-genetic factors: immunological, connective tissue degradation, presence of free radicals
- Socio-cultural factors that influence the lifestyle, the way of thinking of each individual
- Psychological factors - intervene differently in the aging process depending on the personality, habitat and individual professional activity of the patient
- The elderly with good mental and physical health must be actively involved in social life
- in the elderly, the organizational capacity increases, the functions of synthesis, generalization, abstraction are improved
- **Somatic Factors**
 - Each elderly person ages differently, by overlapping chronic and degenerative diseases on an old organism
 - Physical - grey hair, cracked skin, brown spots, damage to each organ
 - Sensorial
 - Decreased vision, hearing, smell, taste, tactile sensitivity
 - Diminished attention, memory, thinking, language, verbal flow, vocabulary
 - Affectivity
 - Emotional lability
 - Irrascibility

Conditions that can cause a decrease in visual acuity in the elderly

- Cataract
- Primary open-angle glaucoma
- Diabetic retinopathy
- Macular lesions with atrophic, exudative ADM
- Optic neuropathy

The association of other physical or mental comorbidities in the elderly with visual impairment accentuates the visual impairment and aggravates the general condition of the patient. Impairment of visual function is accentuated in parallel with aging and as visual function decreases, performance in current activity is significantly reduced [2-10].

- Vision decreases with age due to presbyopia caused by decreased ability of the lens to accommodate by decreasing its elasticity, while reducing the central visual field of macular damage in ADM, peripheral visual field in the evolution of glaucoma, or retinal arterial or venous lesions in HTA, DM, atherosclerosis
- In parallel with the physiological impairment of vision, in the elderly, impaired vision may be induced or accentuated by the general status of the elderly by:
 - Hearing loss amplifies the degree of acuity vision loss
 - Sensory senescence
 - Decreased attention, especially voluntary attention and the ability to concentrate
 - Decreased short-term memory, with difficulties in the ability of spatio-temporal orientation
 - Apathy, depression, emotional lability, disharmonious personality structure
- All of these factors generated by aging, correlated with pre-existing or new developing disorders, may exacerbate vision loss in the elderly by decreasing visual perception
- Blindness may be a real medical problem through objective eye damage or may be exacerbated by decreased visual perception in the context of aging and should be confirmed by an ophthalmologist and internist or geriatrician, investigating the patient's clinical condition for an organic deficiency, psychical, personal, familial or institutional in the conditions in which the eye disease that caused the loss of vision is stationary
- The elderly patient can adapt to low vision and can maintain an active life, even in very low vision conditions, through self-education, if the clinical and mental status gives him enough power to compensate for visual impairment [1,4]
- The elderly person must maintain the living conditions with which he is accustomed; if they change, the patient is disoriented, no longer wants to perform any activity, no longer socializes, moves too hard, vision seems to progressively deteriorate, becomes inactive, depressed, although the clinical examination does not detect aggravating organic, eye or general lesions [3-5]
- These people who report a progressive decrease in visual acuity should be helped to keep their lives as active as possible and to maintain their visual function in various ways, stimulating other senses (music, reading, conversations) so that the elderly to compensate for the significant functional deficit [2]
- Changing the usual place of life of an elderly person is associated with difficulties in adapting and accentuating the visual deficit (although the deficit has no organic correspondence) and can create psychosis and social dependence
- Any visually impaired person must be understood and constantly helped to overcome difficulties, they must be given sufficient attention and self-confidence so that they can ensure their physical and social independence

- The vision deficit is accentuated by the limited power of movement of the elderly patient, by the diminished mobility, but also by the reduction of the psycho-social relations
- Decreased visual function can also occur through neurological involution in various ways [1,9]
- It is important to assess the degree of visual impairment, aggravating factors, but also the possibilities of rehabilitation of visual acuity loss (if possible) by optical correction, medical or surgical treatment if it is necessary and effective [4,10]
- Every elderly person must be recognized for the associated pathology they present and in order to limit absolute degradation, any elderly person must be monitored periodically, but also permanently or as needed [2,8]
- Medication should be well known in the treatment of every elderly patient, as these patients have multiple comorbidities that require multiple drug treatments that have related positive or negative effects (sometimes even toxic effects)
- In the elderly, physical abilities decrease, there is a progressive psycho-intellectual involution, while socially the individual limits his activities and accentuates his pre-existing clinical deficiencies
- Significant aging changes are located in the cardiovascular, respiratory, neurological and locomotor, visual, auditory systems [6]
 - As far as possible, the doctor has the obligation to treat and correct multiple eye and general diseases present in the elderly patient, analysing each evolving sign and symptom, announced by the patient or family
- Elderly patients represent 70% of hospitalized patients and consume a third of their health budget funds
- The evolution during life towards aging is a unidirectional process, through progressive multifunctional degradation associated in time with organic lesions, with evolutionary correlative pathology
- Aging is inevitable and involves a series of processes that start from conception [1,4,5]
 - The changes produced by aging differ from one individual to another and include biological, psychological and social aspects depending on the personality of the elderly
- Aging affects learning ability and reduces previously stored information, but intellectual exercise is useful for prolonging life
- Diseases in the elderly are characterized by [4-6]:
 - Polypathology
 - Long, chronic evolution, with periods of exacerbation
 - Frequent complications

- Prolonged convalescence
- Deterioration of the general condition
- Atypical symptoms
 - lipotony, confusion, irritability
 - painless heart attack
 - febrile infectious diseases
- The elderly person's personal psychosocial problems and his / her relationship with the environment in which he / she lives are essential for the clinical evolution of the elderly patient [7,8]
 - Many friends or relatives die
 - One's self becomes disturbed by age
 - There is the impossibility of being physically and mentally as during youth
 - The elderly person finds the first step (even the tiny one) of walking very difficult
 - Material deprivation, the impotence of old age, measures the percentage of the elderly population that deteriorates irreversibly
- a nutritionally balanced diet is an important condition for a good immunity, for a good general resistance of the body of an elderly person (consumption of vegetables, fruits, hydration, hours of sleep, appropriate clothing, environmental conditions)
- Loneliness generates an accumulation of feelings: sadness, anxiety, melancholy - due to the lack of social contact
- It is important that the family or institution where there are elderly people pay attention and try to understand what the isolated elderly person is going through in his / her existential environment [3-5]
 - Simple gestures of closeness, understanding and respect, of those around the elderly person are an essential help in maintaining a mental balance of a conscious and rational elderly person
- We are currently witnessing a progressive and irreversible demographic aging, with an annual increase of 2.6% in the elderly, compared to the general population of 1.2%, in parallel with the numerical increase of females (women live by 7-8 years more) and emergency geriatrics in the context of geriatric medicine [2,7]

Conclusion

- Aging is a slow progressive process, in which the rate of aging differs from one individual to another through: genetic determination, individual living conditions and pathology specific to each individual
- 70% of deaths are caused by a disease whose dynamics no longer respond to treatment.
- Comorbidities associated with the elderly patient may be accompanied by rapid decompensation

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- The ophthalmologist, the social worker, the family, the institution must help the elderly patient until the end, in order to ensure his human living conditions, in the context of the sometimes major imbalance that some elderly people present
- Any doctor has the obligation to inform the patient (if he collaborates), the family or the institution about the real eye and general conditions present and in evolution
- Patients with major general conditions - diabetes, hypertension - or mental illness - depression, dementia - should be identified, monitored and treated appropriately, any physician having a duty to recognize the associated comorbidities
- The elderly patient needs emotional understanding, sensitivity and real help from close family members, or if they no longer exist, from the social worker in institutionalized cases

Aging is a continuous, dynamic process that must be followed, because in its evolution new connections and balances are created that must be identified and treated appropriately, old age being a distinct stage of ontogenesis that should not be seen as a state of disease.

Conflict of Interest

The authors did not report any potential conflicts of interest in research, authorship and/or publication of this article

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