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Review article

OROPHARYNGEAL DYSPHAGIA IN ELDERLY PERSONS - ETIOLOGY, PATHOPHYSIOLOGY AND SYMPTOMATOLOGY

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Abstract: Swallowing disorders can occur at any age, although they occur more often in old age when the physiology of swallowing changes due to aging. Oropharyngeal dysphagia is a very common clinical condition affecting 13% of the total population over 65 years of age and 51% of institutionalized older people. Given that oropharyngeal dysphagia can lead to increased morbidity and mortality in the elderly, it is necessary to prevent the occurrence of dysphagia in this population group as much as possible. In relation to this, the paper aims to provide insight into contemporary research into the etiology, pathophysiology, and symptomatology of oropharyngeal dysphagia in the elderly. In this review study, the electronic databases of Google Scholar Advanced Search and the Consortium of Serbian Libraries for Unified Procurement - KoBSON were searched. The following keywords and phrases were used in the search: swallowing, dysphagia, oropharyngeal dysphagia, aging, age and dysphagia, etiology of oropharyngeal dysphagia, the clinical picture of oropharyngeal dysphagia, pathophysiology of oropharyngeal dysphagia. This systematic review and meta-analysis of papers showed significant progress in the effective diagnostic approach of oropharyngeal dysphagia during the last years but also a significant lack of knowledge about adequate modifications of drugs applied during the treatment of patients with dysphagia. A good understanding of the etiology, pathophysiology, and symptomatology of oropharyngeal dysphagia would eliminate the harmful effects of pharmacological substances on the function of swallowing, given that the elderly, on the advice of a doctor, use them daily.

Keywords: swallowing disorders, oropharyngeal dysphagia, aging.

INTRODUCTION

Swallowing is a set of movements that take place in the initial part of the digestive tract, and their purpose is to bring chewed food from the mouth through the pharynx and esophagus to the stomach. The act of swallowing is divided into three phases: buccal, pharyngeal, and esophageal. The first phase, buccal, takes place under the control of the will, and the other two, pharyngeal and esophageal, are under reflex control (1).

The oral cavity, larynx, and esophagus take part in the act of swallowing. Disturbance at any level of these structures can cause difficulty swallowing, called dysphagia. If there is difficulty passing food from the oropharynx to the esophagus, the patient has oropharyngeal dysphagia. On the other hand, the problems that occur during the passage of food to the esophagus characterize esophageal dysphagia (1).

Swallowing disorders can occur at any age, although they occur more often at an older age, when, due to the aging process, the physiology of swallowing changes, which leads to dysphagia being experienced by 12 - 25% of people over 50 years old (2). With aging, the humidity of the oral cavity decreases, and the sense of smell and taste weakens as a result of weaker sensorimotor integration, which negatively affects the success and safety of swallowing (3).

Oropharyngeal dysphagia is a very common clinical condition affecting 13% of the total population older than 65 years and 51% of the institutionalized elderly (2). The prevalence of oropharyngeal dysfunction among people living independently, aged 70 to 79, is about 16%. With age, this percentage increases, and for people over 80 years old, it amounts to 33%. This percentage is higher among elderly hospitalized patients and is 47% (4). Patients experience difficulty forming a bite, nasal insufficiency, and cough accompanying tracheal aspiration (5). It most often occurs in people with neurological or muscular disorders affecting skeletal muscles. Neurological diseases in which oropharyngeal dysphagia occurs as a symptom are Parkin-

son's disease, stroke, multiple sclerosis, amyotrophic lateral sclerosis, bulbar poliomyelitis, pseudobulbar paralysis, and other central nervous system damage. Oropharyngeal dysphagia occurs in comorbidity with muscle diseases such as dermatomyositis, myasthenia gravis, and muscular dystrophy (6).

Although oropharyngeal dysphagia causes life-threatening complications, it is often not treated because the elderly are preoccupied with other health problems and ignore the difficulties they have during swallowing. Therefore, it is necessary to include dysphagia screening in the elderly to include the person in rehabilitation in time (5).

The goal

Average life expectancy is constantly increasing worldwide. In 2000 it was 66.8 years of age, while according to the latest statistical analysis, it is 73.4 years of age in 2019 (7). This number is expected to increase even more by 2050 when every sixth individual on our planet will be 65 years or older (World Population Aging, 2019). Given that oropharyngeal dysphagia can lead to increased morbidity and mortality in the elderly, it is necessary to prevent the occurrence of dysphagia in this population group as much as possible. In relation to this subject, this paper aims to provide insight into contemporary research into the etiology, pathophysiology, and symptomatology of oropharyngeal dysphagia in the elderly.

Method

In this review study, the electronic databases of Google Scholar Advanced Search and the Consortium of Serbian Libraries for Unified Procurement - KoBSON were searched. The following keywords and phrases were used in the search: swallowing, dysphagia, oropharyngeal dysphagia, aging, age and dysphagia, etiology of oropharyngeal dysphagia, the clinical picture of oropharyngeal dysphagia, pathophysiology of oropharyngeal dysphagia. The literature was searched in Serbian and English. Papers were collected in which the etiology, pathophysiology, and clinical picture of oropharyngeal dysphagia in the elderly were presented. Works published from the beginning of the 21st century until today were taken into account. The analysis included a large number of papers, but for the purposes of this paper, 23 review and research papers and one monograph were selected, which presented the etiology, pathophysiology, and symptomatology of oropharyngeal dysphagia in the elderly.

RESULTS WITH DISCUSSION

Etiology of oropharyngeal dysphagia

Analyzing the anatomical structure of the esophagus and the clinical manifestations of aging in the esophagus, research shows that the aging process is most reflected in the esophageal sphincter of the esophagus (8, 9).

The esophageal muscle leads to relaxation, extensibility, the distraction of the hyolaryngocricoid complex forward, and the creation of appropriate pressure on the muscle wall during swallowing. Disruption of one of its functions will lead to swallowing dysfunction (5).

Oropharyngeal dysphagia is a frequent companion of many neurological diseases and surgical procedures such as total laryngectomy (10). Radiation can reduce saliva and lead to dry mouth, but also limited mobility of oropharyngeal structures. Pain in the mouth and throat can cause a person to eat less (1).

By asking the question, "What happens when you try to swallow? Do you have trouble chewing? Do you have difficulty swallowing solids, liquids, or both solids and liquids? What are the symptoms associated with difficulty swallowing? How long does your act of swallowing last?". Specialists can identify a specific oropharyngeal type of dysphagia in approximately 80% of patients during history taking (11).

Differentiation of esophageal muscle opening abnormalities in oropharyngeal dysphagia is still a clinically complex process. On the other hand, the frequent neglect of swallowing problems in elderly patients further complicates the diagnostic process (12).

Swallowing coordination and the pathophysiology of oropharyngeal dysphagia

The oral phase takes place under the control of the left hemisphere, and the pharyngeal phase is regulated by the activity of neurons in the right hemisphere (13). Due to the onset of a neurological disease, there is a disturbance in the processing of sensory information, which results in reduced efficiency of swallowing. Due to the plasticity of the brain, physiological recovery reactions occur, but this recovery during the swallowing process does not allow for complete recovery. With the progress of the disease, there are more massive interruptions of the neural networks, and therefore more difficult swallowing physiology (14).

By monitoring the neural processing of swallowing with magnetic resonance imaging, the involvement of bilateral and widespread cortical and subcortical networks was observed. That network includes the involvement of the frontal part of the brain and the basal ganglia (15). As a result of a stroke, one of the most common causes of death in old age, the synchronization of these brain parts, is disrupted. Depending on the localization of the stroke, the degree of disturbance

of the swallowing process will also depend, given that bilateral coordination in the swallowing process has been proven (16).

Unlike a unilateral stroke, the brain damage seen in Amyotrophic Lateral Sclerosis makes it difficult to restore neuronal connections. With the progression of this disease, there is a decrease in cortical activation which further worsens the swallowing process (17). Lesions outside the upper motor neuron in Bulbospinal muscular atrophy will lead to more severe damage to the frontal cortex responsible for deglutition synchronization (18). Analyzing the activity of neurons in Parkinson's disease, adaptive changes in the swallowing process are observed (19, 20).

Signs and symptoms of oropharyngeal dysphagia in the elderly

Problems with swallowing occur due to physiological changes in muscle mass, abnormalities in the function of the muscles involved in swallowing, chemical changes in the enzymes that shape the bite, due to taste and smell disorders, due to the appearance of many neurological diseases associated with brain aging (3). Therefore, prevalence rates increase significantly with patient age.

The term "presbyphagia" describes physiological changes in swallowing. These changes caused by aging affect every stage of swallowing. In the oral phase of swallowing, there is a disturbance in the formation of bites due to insufficient saliva production. Disturbance in this phase of swallowing affects prolonged activation of the swallowing reflex, leading to frequent aspiration in the elderly (21).

A large number of accompanying symptoms of oropharyngeal dysphagia are often associated with the effects of aging factors and diseases. Over the years, an increasing number of people have had some form of pharmacotherapy every day. Consuming different drugs intended to control various diseases leads to functional changes in the regions involved in the act of swallowing (22). On the other hand, analyzing the function of the regions involved in the act of swallowing in healthy old people, Rogus and Logeman (23) found no differences in the function of swallowing. This supports the fact that the anatomomorphological characteristics of the regions involved in the act of swallowing change physiologically with age, gradually leading to swallowing disorders.

Several studies have shown that a disturbance in the mass and function of the swallowing muscles can lead to a disturbance in the act of swallowing. Analyzing the differences in function and muscle mass, it was concluded that there is a difference between younger and older subjects. Also, this difference was observed between patients of the same age who suffered from various diseases in favor healthy elderly persons (24, 25). The results of this study raised doubts about the connection between muscle mass and function of the whole body with the mass and function of the swallowing muscles, which has not been scientifically confirmed to date.

CONCLUSION

Oropharyngeal dysphagia is a considerable health problem in the elderly and has recently been classified as a geriatric syndrome. Therefore, it is necessary to include dysphagia screening in the elderly to refer the person to a doctor in time. Bearing these facts in mind, this review aims to analyze current knowledge about the etiology, pathophysiology, and symptomatology of oropharyngeal dysphagia in the elderly.

This systematic review and meta-analysis of papers showed significant progress in the effective diagnostic approach of oropharyngeal dysphagia during the last years but also a significant lack of knowledge about adequate modifications of drugs applied during the treatment of patients with dysphagia.

The results of these studies lead us to the need for more professional training on the etiology, pathophysiology, and symptomatology of oropharyngeal dysphagia for all healthcare workers. A good knowledge of the etiology, pathophysiology, and symptomatology of oropharyngeal dysphagia would eliminate the harmful effects of pharmacological substances on the function of swallowing, considering that the elderly, on the advice of doctors, use drugs daily.

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Licensing

Sažetak

OROFARINGEALNA DISFAGIJA KOD STARIJIH OSOBA - ETIOLOGIJA, PATOFIZIOLOGIJA I SIMPTOMATOLOGIJA

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Poremećaji gutanja mogu se javiti u bilo kom životnom dobu, mada se češće javljaju u starosti kada se fiziologija gutanja menja usled starenja. Orofaringealna disfagija je veoma često kliničko stanje koje pogađa 13% ukupne populacije starije od 65 godina i 51% starijih osoba smeštenih u ustanove. S obzirom na to da orofaringealna disfagija može dovesti do povećanja morbiditeta i mortaliteta kod starijih osoba, neophodno je što je moguće više sprečiti pojavu disfagije u ovoj populacionoj grupi. U vezi s tim, ovaj rad ima za cilj da pruži uvid u savremena istraživanja etiologije, patofiziologije i simptomatologije orofaringealne disfagije kod starijih osoba. Za ovaj rad pretražene su elektronske baze podataka Google Scholar Advanced Search-a i Konzorcijuma biblioteka Srbije za objedinjenu nabavku – KoBSON. U pretrazi su korišćene sledeće ključne reči i fraze: gutanje, disfagija, orofaringealna disfagija, starenje, starost i disfagija, etiologija orofaringealne disfagije, klinička slika orofaringealne disfagije, patofiziologija orofaringealne disfagije. Ovaj sistematski pregled i metaanaliza radova pokazali su značajan napredak u efikasnom dijagnostičkom pristupu orofaringealne disfagije tokom poslednjih godina, ali i značajan nedostatak znanja o adekvatnim modifikacijama lekova koji se primenjuju u lečenju pacijenata sa disfagijom. Dobro poznavanje etiologije, patofiziologije i simptomatologije orofaringealne disfagije eliminisalo bi štetno dejstvo farmakoloških supstanci na funkciju gutanja, s obzirom da ih starije osobe, po savetu lekara, svakodnevno koriste.

Ključne reči: poremećaji gutanja, orofaringealna disfagija, starenje.

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