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THE RELEVANCE OF TEACHING THE SECTION "PARASITOLOGY" IN THE COURSE "BIOLOGY" TO DENTAL STUDENTS

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Abstract:

The importance of mastering biology by medical students cannot be questioned, though students of dental faculties are often not sufficiently motivated to study the course of parasitology, that determines their often-unacceptable level of preparation for classes. Nevertheless, many nosologies in dental practice are closely related to parasitology. Thus, one of the most relevant diseases, periodontitis, is directly related to protozoology.

Purpose. To increase the level of motivation among students of the dental faculty when studying the course of parasitology. To draw the attention of professors to the importance of mastering a course of parasitology by dental students.

Material and Methods. The analysis of the specialized literature in the electronic databases PubMed, Web of Science, Scopus, eLibrary on the prevalence and various manifestations of parasitic diseases in the maxillofacial area.

Results. The article for the first time provides a consistent and logical arguments on the importance of studying all sections of parasitology (protozoology, helminthology, entomology) by students of dental faculties. On the clinical cases described in the literature, not only academic, but also practical value of mastering the discipline is demonstrated.

Conclusion. The mentioned arguments will increase the level of motivation among students and professors, improve the quality of teaching in the section "Parasitology" for dental students. A number of theses put forward in the article can be used in pedagogy to increase the level of motivation of students from other areas.

Keywords: *pedagogy, medical school, dentistry, parasitology, maxillofacial area*

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INTRODUCTION:

According to the Great Soviet Encyclopedia [1], biology is a complex of the sciences of the living nature. Based on the definition, the importance of mastering this discipline by medical students cannot be questioned, since the successful study of narrower biological disciplines by future healthcare professionals is greatly complicated by the lack of basic knowledge. The great Russian pathologist I.V. Davydovsky wrote: “Medicine, taken in terms of theory, is, first of all, general biology” [2]. Nevertheless, I. S. Vyshegorodtseva [3] concluded that the issue of increasing motivation to study biology in medical universities is quite relevant in the world. Leading scientists have been paying attention to the problem since the sixteenth century, but especially active actions in this area have been observed since the middle of the twentieth century. The motivation of students to study the subject largely depends on their understanding of the possibility of applying the gainedknowledge in the professional sphere [4]. A similar conclusion can be made regarding teachers, who, generally, are more motivated in the detailed presentation of the material and its control among students in the core field, than among the less interested students of other specializations [5]. Thus, the formation of a “vicious circle” can be noted: the unsatisfactory interest of students in the subject reduces the teacher's motivation to present the material, which in turn affects the quality of students' training and, ultimately, their knowledge level.

The course of biology for students of pharmaceutical, medical, pediatric and dental faculties is diverse and includes the following sections: cytology, genetics, embryology, protozoology, helminthology, arahnoentomology, evolutionary teaching, ecology etc.

There are no principal differences in the studied sections for different faculties, however, there is a difference in the number of hours devoted to the assimilation of the material. For example, traditionally in many universities, special attention is paid to the issues of the maxillofacial apparatus phylogenesis, which is of particular importance since its pathologies are included in syndromes of many hereditary diseases and congenital malformations [6]. The main scientific direction of the Department of Biology and General Genetics of Sechenov University since 1952 is medical zoology, in particular parasitology [7]. A great contribution to the development of parasitology was made by the heads of the department: F.F. Talyzin, Yu.K. Epiphany, N.V. Chebyshev. Therefore, traditionally, special attention is paid to this discipline at Sechenov University. However, students of the dental faculty are often not sufficiently motivated to study the course of parasitology, which determines their often-unacceptable level of preparation for classes. One of the arguments is the alleged lack of the applied value of the knowledge gained in the specialty.

Purpose: To improve the quality of teaching the section "Parasitology" for dental students. To increase the level of motivation among professors and students of dental faculties when teaching and studying the course of parasitology.

MATERIAL AND METHODS:

The analysis of the specialized literature in the electronic databases PubMed, Web of Science, Scopus, eLibrary, on various manifestations and incidence of parasitic diseases in the maxillofacial areawas carried out.

RESULTS AND DISCUSSION:

Higher medical school should develop students' ability to self-creative activity, expanding the horizons and shaping the personality of the future specialist [8]. Thus, the study of parasitology develops clinical way of thinking, expands the boundaries of world perception and forms a critical

approach to the actual reality. Traditionally, the opinion of the doctor in many areas of life associated with medicine, but not directly related to the profile of a specialist, is authoritative. This aspect imposes a certain responsibility on a medical graduate. So, with the growing popularity of outdoor activities, ecotourism, increasing the number of international flights, increasing and changing the direction of migration flows, the spread and structure of parasitic diseases change. It is also necessary to take into account the growing popularity of keeping pets, including exotic ones. Owners, especially children, sometimes kiss their pets, which also affects the growth of invasions. Thus, a"rapprochement" among domestic animals and people can be established. It is the duty of any doctor, including the dentist, to conduct preventive measures in a broad sense, to prevent the development of parasitic diseases, and, in case of suspicion, to direct them to a narrow specialist.

Many diseases, including oral ones, have a multifactorial etiology, which requires a doctor to master basic knowledge in all medical specialties. For example, often helminthiasis is called one of the causes of bruxism [9, 10], which is widely reflected in the media. Despite the lack of a reliable correlation between helminthiases and bruxism in later works [11, 12], many modern patients and some physicians are convinced of the existence of such a relationship. The availability and ambiguity of information in the modern world can also entail negative consequences for the patient's health. Thus, the doctor should have a broad outlook, follow the news of the scientific world not only within his narrow specialization, but also in related disciplines, in particular - parasitology. However, the relevance of studying parasitology by students of the dental faculty is not limited to these facts.

Periodontitis.

An oral amoeba (Entamoeba gingivalis) and oral trichomonas (Trichomonas tenax) can dwell in the human oral cavity. Protista live in the folds of the mucous membrane, gum pockets, dental plaque, carious cavities of the teeth, on the crypts of the tonsils. The form of their relationship with the human body is often defined as commensalism, but numerous studies can not accurately determine their role in the development of pathological processes in the oral cavity [13].

Periodontitis is one of the most common diseases, its incidence among patients over 30 reaches 50% [14]. In developed countries, periodontitis is the main cause of secondary adentia. M. Bonneri [14] in their studies found a statistically significant correlation between the presence of E. Gingivalis and the development of periodontitis.

Back in the early 1980s, T. Lyons discovered E. Gingivalis in periodontal pockets, that is, in patients with periodontitis, but this organism was absent in intact tooth-gingival sulci [15]. Assuming thatprotozoa can be a causative agent of periodontitis, the scientists developed a treatment regimen with hydrogen peroxide and metronidazole, which turned out to be quite effective [16]. Trim R.D. et al. [17] concluded that E. Gingivalis is absent in healthy dento-gingival sulci. Using real-time PCR, the authors found the presence of this protozoa in 69% of periodontal pockets.

Another protozoon - Trichomonas, according to C. Bisson et al. [18] is also absent in healthy people. The presence of the Protista in periodontal pockets, according to the same authors, is about 11%. Moreover, the presence of the parasite correlates with the abnormal mobility of the teeth, the greater loss of bone tissue.

An important point associated with the habitat of the Protista and their mobility is that they can penetrate into the nasal sinuses, nasopharynx, or lungs transferring bacteria from the oral cavity to these organs [13].

Thus, we can conclude that one of the most relevant diseases in dentistry — periodontitis cannot be considered in isolation from protozoology. Specialists such as dental hygienists, therapists, and periodontists should be well versed in parasitology.

Helminthiasis.

Helminths are rarely the causative agents of oral cavity diseases, but many such cases are described in the literature. The most frequent helminthiasis in maxillofacial area include three diseases caused by flatworm larvae (cysticercosis, sparganosis, echinococcosis), and four diseases - roundworms (trichinosis, trichuriasis, filariasis, Larva migrans) [19]. The frequency of cysticercosis is higher than the others. Most often it affects the tongue, chewing muscles. Helminthiasis can be mistaken for atheroma, mucocele, benign tumors, various diseases of the salivary glands. Some helminth infections, for example, trichocephallosis, may be accompanied by the development of hypertrophic gingivitis, ulceration of the oral mucosa, glossitis [20].

Fast and correct diagnosing isof great value in such cases to start the necessary treatment immediately.

"Parasitological vigilance" is especially relevant among surgical specialists — oral and maxillofacial surgeons, as well as among specialists in mucous membranes when the patient has an appropriate epidemiological history.

Oral mias. Bio-surgery.

Oral miasis is a rare disease in which larvae of Diptera parasitize in the human oral cavity. Usually occurs in socially unprotected patients living in the tropics [21]. Cases of the development of miasis in periodontal pockets in patients with an open bite and poor oral hygiene have been observed [22]. The diagnosis is usually not difficult for a specialist, but it can confuse a dentist who is not good enough at parasitology and entomology.

Bio-surgery, or larval therapy, has again begun to gain popularity in the United States and Western European countries for the treatment of certain purulent-necrotic diseases with an increase of antibiotic-resistant strains. In biosurgery, sterile larvae of some flies are used. Being facultative parasites, they eat necrotic tissue, leaving intact one [23]. The main mechanisms of therapeutic action: cleansing the wound from necrotic tissue, destruction of the biofilm and disinfection of the wound, stimulation of regeneration. These effects are achieved through the production of antibiotic-like substances by the larva, proteolytic enzymes, an increase in the pH, and the mechanical destruction of the biofilm [24].

The use of such an approach in dentistry is unacceptable for most people. Nevertheless, some attempts are being made [25] even in this field. Moreover, it is possible that biosurgery will be used in maxillofacial surgery in the treatment of some purulent-necrotic wounds that do not have communication with the oral cavity.

CONCLUSION:

1) There are many disciplines, the development of which seems to students optional, which affects the quality of their training and level of knowledge. One of the tasks of the teacher is to competently and convincingly demonstrate the importance of studying the subject, motivate the student. A number of theses put forward in the article can be used in pedagogy to increase the level of motivation among students in other areas when studying various disciplines.
2) Although the link between parasitology and dentistry is not obvious, both sciences have many points of contact.
3) One of the most common and urgent diseases in dentistry – periodontitis-cannot be considered in isolation from protozoology.
4) Such disciplines ashelminthology and entomology can be directly related to dentistry.

The above arguments, from our point of view, will significantly improve the quality of students training, increase their motivation to study the subject and thereby increase the level of professionalism in the future.

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