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THE ROLE OF VIDEO MATHERIALS IN STUDYING THE IMMUNOPATHOGENESIS OF BRONCHIAL ASTHMA

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РОЛЬ ВІДЕОМАТЕРІАЛІВ У ВИВЧЕННІ ІМУНОПАТОГЕНЕЗУ БРОНХІАЛЬНОЇ АСТМИ

Abstract. The high pace of development of medical science puts before the medical student the task of finding relevant and reliable information to prepare for classes. Modern education in higher educational institutions focuses on technologies that ensure the development of individuality, without which a breakthrough in the training of a competitive specialist is almost impossible. Teachers are constantly looking for ways to optimize student activities and want to see students as active managers of the acquired knowledge.

In recent years, along with traditional forms of education, the organization of student work is also created on the basis of modern information and educational technologies.In order to increase students' knowledge and improve the process of preparation for classes, it is necessary to use the most informative and easy to understand learning materials, including video films. 86 Students of the 5th course who studied the cycle "Clinical Immunology and Allergology" at the Department of Occupational Diseases and Clinical Immunology, participated in the questionnaire on the topic "Atopic Disease", where they depicted the immune response scheme for bronchial asthma according to the immunological stages, noting the participant cells and main cytokines, as well as pathophysiological manifestations. Then the students were shown a video "Immunopathogenesis of bronchial asthma", created at the department, and were asked to redraw a scheme. For completeness of the description, students received scores, the number of points was determined using the specific word-markers. According to the obtained data, a significant increase in the knowledge of students from all immunological phases of bronchial asthma was determined after watching the film. The use of educational materials, in particular visual ones, in addition to the main source of study - textbooks, can contribute to raising the level of students' knowledge of the subject being studied.

Key words: education; teaching methods; video film; clinical immunology and allergology.

Анотація. Високі темпи розвитку медичної науки ставлять перед студентом-медиком завдання з пошуку актуальної і надійної інформації для підготовки до занять. Сучасне навчання у вищих навчальних закладах орієнтується на технології, що забезпечують розвиток індивідуальності, без чого прорив у підготовці конкурентоздатного фахівця практично неможливий. Викладачі постійно ведуть пошук шляхів оптимізації діяльності студентів і хочуть бачити в студентах активних розпорядників отриманих знань.

Останніми роками, разом із традиційними формами навчання, організація роботи студентів створюється також на основі сучасних інформаційних та навчальних технологій.

З метою підвищення знань студентів та покращення процесу підготовки до занять необхідно використовувати найбільш інформативні та легко зрозумілі матеріали навчання, зокрема й відеофільми. Студенти 5 курсу, що навчалися на кафедрі професійних хвороб та клінічної імунології з циклу «Клінічна імунологія та алергологія», загалом 86 студентів, проходили анкетування за темою заняття «Атопічні хвороби», де вони зображували схему імунної відповіді при бронхіальній астмі згідно з імунологічними стадіями, зазначивши клітини-учасники та головні цитокіни, а також патофізіологічні прояви. Потім студентам показували відеофільм «Імунопатогенез бронхіальної астми», створений на базі кафедри, та просили кольоровими ручками доповнити схему. За повноту опису студенти отримували бали, кількість балів визначалася за використанням студентом специфічних слів-маркерів. Згідно з отриманими даними, після перегляду фільму визначалося достовірне підвищення знань студентів з усіх імунологічних фаз бронхіальної астми. Використання навчальних матеріалів, зокрема візуальних, додатково до основного джерела навчання – підручників, може сприяти підвищенню рівня знань студентів з теми, що вивчається.

Ключові слова: освіта; методи навчання; відеофільм; клінічна імунологія та алергологія.

Introduction. The high pace of development of medical science makes the medical student to find relevant and reliable information to prepare for classes [4]. Modern education in higher educational institutions (HEIs) focuses on technologies that ensure the development of individuality, without which a breakthrough in the training of a competitive specialist is almost impossible. University teachers are constantly looking for ways to optimize the activities of students and want to see students as active managers of the acquired knowledge [5].

Modern conditions require the use of interactive technologies through the organization of knowledge acquisition and the formation of certain skills and abilities on the basis of active interaction between teacher and students, building interpersonal communication between students and teachers in order to achieve better mastery of the material. In recent years, along with traditional forms of education, the organization of student work is also created on the basis of modern information and educational technologies [1, 5].

The use of video materials is an active method of teaching, which ensures the manifestation of greater activity than traditional methods, because it has been experimentally established that up to 10 % of what he hears is imprinted in a person's memory, up to 50 % of what he sees, and up to 90% of what does. However, the term "interactive learning" is understood in different ways. The concept of "interactive" comes from the English "shnteract" ("Inter" is mutual, "act" - to act). Interactive means to interact, to be in a conversation mode, a dialogue with something (for example, a computer) or someone (a person). Therefore, inactive learning is primarily collaborative learning. Moreover, this happens in an atmosphere of goodwill and mutual support, which allows not only to gain new knowledge, but also develops the very cognitive activity.

The multiple increase in information flows forces to formulate fundamentally new priorities in the training of future doctors. Today is characterized by the emergence and development of distance learning technologies, which takes place along with traditional methods, the use of the former allows you to teach and learn individually, regardless of place and time. There is a growing number of distance learning students around the world. The related rapid development of innovative technologies, the processes of globalization, the emergence of the knowledge economy, etc. have actualized the task of qualitatively improving the intellectual potential of future doctors.

There is an objective need to adapt the education system to new circumstances, when, among other important tasks, the preparation of physicians for full self-functioning in the technology of the future, when computer competence becomes a mandatory component of any which professional activity, and, secondly, the effective use in the educational process of all the possibilities of modern information technology and the educational potential of the global electronic information space.

Scientists note that the use of educational and methodical videos contributes to the formation and development of communicative competence, increase motivation to study the discipline and is an inexhaustible source of educational material. As the quality of video materials does not always exist at a high level, further development of a scientifically sound approach to the creation of educational video remains relevant and necessary.

It should also be noted that the latest approach demonstrates that in the learning process it is advisable to use educational video, as auditory and visual analyzers are the dominant channels of perception of educational material. The use of video materials significantly improves the efficiency of the educational process, encourages communicative activities and allows you to learn up to 65 % of the material.

The modern medical student is very different from his predecessors because he lives in a digital society. In this sense, the video is multimodal, ie it involves different senses, thereby improving the perception and assimilation of educational materials. The objective social significance of the video confirms the expediency of its use in the educational process. There are a large number of modern video creation software products that allow you to diversify the presentation of the material with the help of animated presentations, original scripts, various storylines.

The cycle of clinical immunology and allergology is quite complex and requires the assimilation of a large amount of new information in a short period of time, and only the textbook can not help the student understand the whole range of immunological processes and their features [3]. When creating educational material and organizing the educational process, the student should take into account the specifics of the discipline. Many medical sciences have a significant visual component, without which a true understanding of the subject is impossible: anatomy, histology, immunology, etc. The study of these subjects in textbooks, which contain mostly textual component with minimal visual

explanation, may be insufficient. In addition, the time to study the subject is limited, so it is necessary to use the most informative and easy to understand teaching materials that best meet the requirements. These can be visuals, including videos.

The aim – to evaluate the possibilities of using interactive learning during independent work of students to form a deep internal motivation of each student in obtaining, analyzing and applying information from different sources and to determine whether the screening of the video "Immunopathogenesis of atopic bronchial asthma", created on the basis of the Department of Occupational Diseases and Clinical Immunology of the Dnipro State Medical University influences the level of knowledge of 5th year medical students cycle "Clinical Immunology and Allergology".

Methods. On the basis of the Department of Occupational Diseases and Clinical Immunology, in order to increase students' knowledge on the topic of "Atopic Diseases" was created animated video "Immunopathogenesis of bronchial asthma" (Fig. 1).

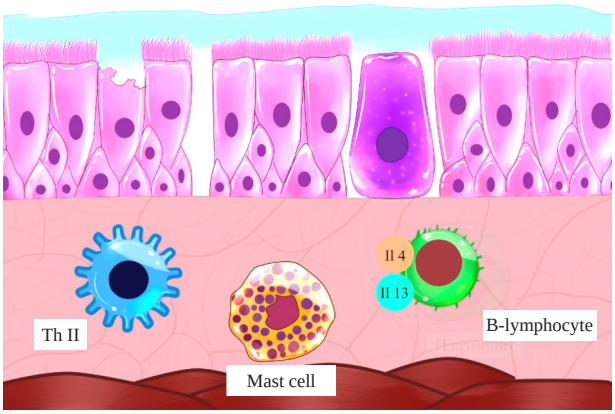

Fig. 1. Frame from the film "Immunopathogenesis of atopic bronchial asthma".

During the first semester, 5th year students of the 1st medical and medical-preventive faculties, who studied at the Department of Occupational Diseases and Clinical Immunology from the cycle "Clinical Immunology and Allergology", a total of 86 students, took questionnaires on the topic of the lesson. asthma according to immunological stages, noting the participating cells and major cytokines, as well as pathophysiological manifestations. Then the students were shown a video and asked to complete the scheme with colored pens. For the completeness of the description, students received the following points:

Stage 1 (immunological) – a maximum of 4 points

Stage 2 (early pathochemical) – a maximum of 10 points

Stage 2 (late pathochemical) – a maximum of 8 points

Stage 3 (pathophysiological) – a maximum of 4 points

In total, each student could score 26 points.

The number of points was determined by the student's use of specific marker words, such as "mast cell", "histamine", "IL 5", "bronchial remodeling" and others involved in a particular immunological process.

Results. According to the obtained data, after watching the film, a significant increase in students' knowledge of all immunological phases of bronchial asthma was determined (Table 1).

Next, the percentage of correct answers was calculated compared to the maximum number possible from each immunological phase (Table 2).

In the initial survey, students were best oriented in the early pathochemical stage, which includes the release of histamine and other mediators by mast cells upon re-contact with the allergen, and in the pathophysiological stage, which includes clinical manifestations of bronchial asthma, including bronchial edema and bronchial tissue edema. Most likely, students had this knowledge from earlier courses.

Students showed less awareness from the immunological stage, which is a general scheme of the immune response. Most likely, most students were unable to relate the immunological process to the sensitization phase itself. The worst knowledge in students was from the late pathochemical stage, which is the activation of eosinophils, which can lead to remodeling of bronchial tissue. Also, according to GINA 2018, an increase in

Table 1. The number of points received by 5th year students in the questionnaire on "Immunopathogenesis of bronchial asthma"

Stage	Before showing the video, points	After showing the video, points	Wilcoxon's test, p
Stage 1 (immunological)	1.0 [0.0; 3.0]	3.0 [2.0; 4.0]	0.013
Stage 2 (early pathochemical)	5.0 [3.0; 7.0]	6.0 [5.0; 7.0]	0.019
Stage 2 (late pathochemical)	0.0 [0.0; 1.0]	2.0 [1.0; 3.0]	0.014
Stage 3 (pathophysiological)	3.0 [3.0; 3.0]	3.0 [3.0; 4.0]	0.018
General level of knowledge	9.5 [6.0; 13.5]	13.0 [11.0; 16.0]	0.011

Table 2. Percentage of correct answers from 100 % possible in 5th year students on the topic "Immunopathogenesis of bronchial asthma"

Stage	Before showing the video, %	After showing the video, %	Wilcoxon's test, p
Stage 1 (immunological)	25.0 [0.0; 75.0]	75.0 [50.0; 100.0]	0.012
Stage 2 (early pathochemical)	50.0 [30.0; 70.0]	60.0 [50.0; 70.0]	0.016
Stage 2 (late pathochemical)	0.0 [0.0; 12.5]	25.0 [12.5; 37.5]	0.013
Stage 3 (pathophysiological)	75.0 [75.0; 75,0]	75.0 [75.0; 100.0]	0.015
General level of knowledge	36.5 [23.1; 51.9]	50.0 [42.3; 61.5]	0.011

the level of eosinophils in the blood is one of the risk factors for exacerbations and a risk factor for fixed restriction of air flow, and an increase in eosinophils in sputum is a marker of airway inflammation [6]. The results obtained above may indicate that students' knowledge is somewhat primitive and needs to be modernized, including through familiarization with international patient management guidelines.

Students were also asked to conduct a separate survey in which they had to answer whether they needed to show videos of what they were studying. 86 students (100 %) answered yes, and noted that showing videos will allow them to better understand the topic and explain to future patients the need for treatment.

The use of videos in the learning process can increase students' knowledge of the topic being studied. Recently, Willmot et al. (2012) showed that there is strong evidence that digital videos can inspire and engage students when they engage in student-centered learning activities by increasing student motivation, enhanced learning experiences, and deeper study of the subject [8]. This is confirmed by domestic researchers. Thus, according to OO Hrybiuk, the cognitive theory of multimedia learning is actively used in the educational process, respectively, the importance of visualization as a didactic tool is beyond doubt. Particular attention is paid to the use of dynamic visualization (animation), which improves the accessibility for students to understand the descriptions of processes, evolution of objects in the context of possible modified effects [7].

Thus, the use of computer technology provides ample opportunities for information visualization, simulation of a variety of situations, management flexibility and individualization of learning. With its introduction, the learning technology changes, but the need for other learning tools does not disappear [2]. The use of various teaching aids radically changes the structure of classes, helps to make better use of every minute of study time, as clearly as possible to present complex material and ensure its rapid and strong assimilation, reduce time for information transfer and control, while increasing the duration of independent student work [2].

Conclusions and Prospects for Research. 1. The learning process in the discipline of "Clinical Immunology and Allergology", and in particular the study of "Atopic Diseases" may require not only textbook learning, but also additional teaching methods, including visual, for better perception of the material.

2. Additional display of videos on the topic being studied, including self-created staff of the department, significantly improves students' knowledge.

3. The level of knowledge of students on the immunopathogenesis of bronchial asthma was imperfect and more schematic, which may indicate the need for additional familiarity with modern international guidelines for patient management.

4. Discussion of the topic with the display of graphic materials during classes has a significantly better effect on the level of knowledge on the topic than just the student's independent work with the textbook. The video is convenient for use and reproduction in various life situations, whether it is a classroom, or a hospital ward, or a reception of a patient in a clinic.

5. The use of educational materials, in particular visual, in addition to the main source of education – textbooks, can increase the level of knowledge of students on the topic being studied. The results of the questionnaire confirm that students are not only ready to perceive the educational material through video, but also strive for it.

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