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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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DYNAMICS OF HPV GENOTYPES AND THE RESULTS FOUND IN CYTOLOGICAL LESIONS OF UNIVERSITY STUDENTS: A COMPARATIVE STUDY

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Abstract.

Aim of the Study: The objective of this study was to evaluate the prevalence of human papillomavirus (HPV) genotypes and their relationship with different grades of cytological lesions in female students of the Faculty of Health Sciences of the National University of Chimborazo. **Material and Methods:** The research had a quantitative and descriptive approach, with a comparative analysis of HPV genotypes and cytological lesions in students of the Faculty of Health Sciences. It is an experimental and field study, cross-sectional and retrospective, conducted from November 2023 to March 2024. Thirty students were selected by quota sampling, analyzing conventional cytology and data using SPSS 26. The results showed that 75.8% of the samples had Bethesda Negative results, whereas 24.2% had some degree of cytological lesion (ASC-US 13.7%, L-SIL 8.1%, H-SIL 1.6%, and ASC-H 0.8%). Genotyping showed the high prevalence of HPV, with HPV 18 and 33 being the most common high-risk genotypes. The most common low-risk indicators were HPV 43 and 42. **Conclusions:** The study confirmed the high prevalence of HPV among female university students and established a significant correlation between high-risk genotypes and the presence of more severe cytological lesions. These findings underscore the need for interventions aimed at prevention and early treatment of HPV, especially in high-risk populations.

Key words. Human papillomavirus (HPV) genotypes, cytological lesions.

Introduction.

The human papillomavirus (HPV) is a sexually transmitted viral infection, women at some point in their lives will contract the HPV virus. This is the main precursor to the development of cervical cancer. The main objective of this research will be carried out through the comparative analysis between HPV genotypes and cytological lesions found in students of the Faculty of Health Sciences.

Cervical cancer is a global health problem, with 4.5% of cases associated with HPV infection. High-risk (16 and 18) and low-risk (6, 11, 16, 18, 31, 33, 45, 52, 58) genotypes were evaluated [1]. The WHO reported 570,000 new cases in 2018. In 2023, the American Cancer Society estimates 13,960 cervical HPV diagnoses. Latin America and the Caribbean, the fourth most affected region, registers 83,000 diagnoses and 35,000 deaths annually. Early vaccination, diagnosis and timely treatment are key to prevention [2].

It is important to note that this disease is mostly preventable with HPV virus vaccination in early adolescence, diagnosis, and treatment. Uterine cancer is the most prevalent disease in Latin America, with Bolivia, Colombia, Brazil, Peru and Ecuador being the most affected countries. Ecuador ranks 12th out of 70 countries in terms of published cancer incidence data across five continents, being the third highest rate after others [3].

In Ecuador, a study on human papillomavirus (HPV) genotyping found that the HPV-16, HPV-6, HPV-31, and HPV-58 genotypes belong to the high-risk subtype, while HPV-71 is considered low-risk [4]. In addition, a study carried out by the Society for the Fight Against Cancer (SOLCA), in Loja, determined that the most found genotypes are HPV-16 and HPV-18 [5,6]. Conventional Pap smear is a standard tool for diagnosing uterine cancer [6]. Successful collection of specimens, including cells from the uterine transformation zone, is critical to identifying morphological changes and categorizing cytological lesions based on Bethesda's reporting systems [7]. This method can identify overlapping cells and their unique morphology [8].

Altered morphology caused by the human papillomavirus can be seen in cervicovaginal extensions. HPV infection affects cells in the basal and parabasal layers of the epithelium of the cervix, causing minor erosions [9]. Among the most common morphological features are intermediate strata, epithelial enlargement, acanthosis and condylomas, to name a few [10].

This study focuses on analyzing the dynamics of HPV genotypes and their relationship with cytological lesions in university students, providing a diagnostic tool to identify and categorize lesions caused by various genotypes of the virus. The goal is to determine how low-grade genotypes cause external genital lesions and high-grade genotypes cause cytological changes in the cervix. This study will benefit students in the final semesters of the Faculty of Health Sciences of the National University of Chimborazo. It will improve understanding of HPV biology and its effects on cervical cells, as well as diagnostic accuracy and clinical decision-making.

The goal is to identify intraepithelial lesions before they progress to cervical cancer by performing a comparative analysis of HPV and cytological lesions that cause infections in health science students. Conventional cytology will be used to detect HPV-induced lesions, while PCR will be used to identify the virus due to its high sensitivity and specificity, even in early stages of infection. Consequently, they contribute to an accurate diagnosis, which is why the following research questions are posed.

In the Latin American context, with emphasis on Ecuador, the problem of HPV is important due to the high prevalence of infections and their association with risk factors such as early sexual intercourse, multiple sexual partners, a weakened immune system, and the inappropriate use of preventive

measures. Uterine cancer is a major public health problem and, despite national efforts to improve its detection and prevention, its incidence remains high. This situation highlights the importance of improving the understanding and management of HPV infections and their consequences for women's health, particularly among female university students who may be at increased risk due to sexual behaviors, decision-making, and biological factors [11].

Materials and Methods.

Approach.

The present research has a quantitative, descriptive approach, with a comparative analysis of HPV genotypes and cytological lesions in students of the Faculty of Health Sciences. This study is also experimental, and field based. This was based on a review of the literature and data obtained from the results, which allowed for the collection of actual quantitative data. This is a cross-sectional cohort study conducted over a set period of time from November 2023 to March 2024, yielding a single set of results in each phase. In addition, it is a retrospective study, as it is mainly based on the compilation of information from a variety of bibliographic sources published in databases [12].

Population and sample.

The present research project included a significant group of students from the Faculty of Health Sciences of the National University of Chimborazo during the 2023-2S semester. The initial population size was 124 women, obtained through a quota sampling method, where students were classified by careers, including: nursing (21), dentistry (12), psychology (14), physiotherapy (24), laboratory (32) and medicine (21), to subsequently select a quota from each group.

From the 124 women, a sample of 30 of the students was obtained, including as mentioned by Mohammad [13] inclusion criteria such as those women who underwent a PAP smear for the first time, or those who had cytological changes, after being selected on the basis of the presence of the intraepithelial lesions identified. This methodology provided a representative and relevant sample to study HPV gene dynamics and their impact on cognitive lesions in university students. Conventional cytology revealed intraepithelial lesions to treat uterine cancer. These can be detected by certain important characteristics such as the number of sexual partners they have had and age, which are described as ranging from under 15 years, 16-18 years and over 18 years.

Collection of Information.

The information was obtained through a study carried out on students from the different careers of the Faculty of Health Sciences. A format for reporting the results of conventional cytology and molecular biology was developed in an Excel sheet to tabulate the data in the SPSS 26 statistical package. Each result was recorded taking into account the variables studied. The authors carried out the pertinent tests and data collection through an informed consent, which was shared with the authorities of the university's health faculty.

Next, students from various majors and parallels of the Faculty of Health Sciences of the National University of Chimborazo were randomly selected. Each participant was explained in detail about the purpose of the study, the procedures to be followed, and the possible risks and benefits. It ensured that all students fully understood the voluntary nature of their participation and had the opportunity to ask questions and address any concerns before making their decision. The students who agreed to participate agreed to the socialized informed consent, ensuring that their participation was entirely voluntary and conscious. This process of obtaining informed permission was vital to comply with the ethical standards of the research and to respect the rules of the institution.

Information Processing.

Statistical techniques were used to process and analyze lesion data from the population studied, allowing for an accurate and rigorous interpretation of the research results. A number of statistical tools, including descriptive statistics, were used to summarize and organize the data in a clear and concise manner.

The data were systematically stored in an Excel spreadsheet, which included all the variables important to the study. This organized storage of the data facilitated the tabulation and visualization of the frequency of the observations, as well as the percentages corresponding to each variable. This meticulous approach to data management made it possible to perform statistical analyses through the SPSS 26 software and obtain solid conclusions. After the data were processed, the results were presented in a clear way, which facilitated the interpretation and discussion of the results in the context of the study on the dynamics of HPV genotypes and the results in the cognitive lesions of university students.

Results.

In this section, the results of the research are presented, in which 124 students from the Faculty of Health Sciences of the National University of Chimborazo participated. The objectives linked to the research questions of this study were to distinguish the different degrees of cytopathic lesions to establish the incidence of these lesions in the population, to organize the results of the HPV genotypes to determine the prevalence of low- and high-risk strains.

The different levels of cytological lesions were identified to determine their prevalence in the population. In addition, the organization was based on the different results of the HPV genotype to determine the prevalence of strains that constitute a low- or high-risk lesion that causes uterine cancer.

The study was conducted on a total basis of 124 students enrolled in various programs of the Faculty of Health Sciences of the National University of Chimborazo. The results show a significant increase in cytological lesions, which are classified according to their level of abnormality.

It is estimated that 75.8% of the population obtained a normal result, i.e., Bethesda negative for intraepithelial lesions. There were 13.7% cells of unknown significance (ASC-US), 8.1% with L-SIL (low-grade intraepithelial lesion), and 1.6% with H-SIL. Finally, 0.8% had ASC-H (atypical squamous cells that cannot be removed due to severe squamous intraepithelial lesions) (see table 2).

Table 1. *Research Questions.*

PI1	What are the most prevalent HPV genotypes in female students of the Faculty of Health Sciences of the National University of Chimborazo and how are they related to different degrees of cytological lesions?
PI2	What differences exist in the incidence of cytological lesions between the low- and high-risk genotypes of HPV in this population?
PI3	To what extent does the combination of cytological information and identification of HPV genotypes improve diagnostic accuracy and risk stratification in the management of cervical cancer in female university students?

Table 2. *Incidence of HPV cytological lesions (n=124).*

Frequency			**Percentage**
Valid ASC-H		1	0,8
	ASC-US	17	13,7
	Bethesda Negative	94	75,8
	H-SIL	2	1,6
	L-SIL	10	8,1
	Total	124	100,0

Table 3. *Prevalence of high-risk HPV genotypes in students.*

Frequency			**Percentage**	**Valid Percentage**	**Cumulative Percentage**
Good	**HPV 11**	1	12.5	16.7	16.7
	HPV 42	2	25.0	33.3	50.0
	HPV 43	3	37.5	50.0	100.0
	Total	6	75.0	100.0	

Table 4. *Table of Relationship Between Cytological Lesions and Genotypes.*

Cytological lesions						
Bethesda Negative			**ASC-US**	**L-SIL**	**ASC-H**	**H-SIL**
HPV Genotypes	**HPV 11**	0	0	1	0	0
	HPV 16	1	0	1	0	0
	HPV 18	3	2	1	1	0
	HPV 26	0	1	0	0	0
	HPV 31	0	3	2	0	0
	HPV 33	3	3	1	0	0
	HPV 35	0	1	1	1	0
	HPV 39	1	2	0	0	0
	HPV 42	0	0	1	0	1
	HPV 43	0	0	2	0	1
	HPV 45	0	0	1	0	0
	HPV 51	0	1	0	0	0
	HPV 52	0	1	0	0	1
	HPV 53	0	1	0	0	0
	HPV 56	0	2	0	0	0
	HPV 58	0	2	2	0	0
	HPV 59	0	1	0	0	0
	HPV 66	0	2	2	0	0
	HPV 68	0	0	1	0	0
	HPV 73	0	0	1	0	1
	HPV 81	0	1	0	0	0
	HPV 82	1	0	0	0	0
	HPV Negative	0	7	1	0	0

The following results were obtained from the studied sample of high-risk genes: HPV-18 has an incidence of 14.29%, followed by HPV-31 and HPV-33 with an incidence of 12.2%, and HPV-58 and HPV-66 have an incidence of 8.1%. In addition, the HPV-35, HPV-39 and HPV-56 genotypes have a rate of 6.1%, followed by the HPV-16, HPV-52 and HPV-76 genotypes, which have a rate of 4.0%. Finally, the genotypes HPV-26, HPV-45, HPV-51, and HPV-53. HPV-59, HPV-68 and HPV-82 represent 2.01% of the sample studied.

The results corresponding to the low-risk genotypes revealed a significant distribution of the different HPV strains. The HPV-43 genotype was the one with the highest incidence, representing 50% of the low-risk cases detected in the study population. This genotype is usually associated with benign lesions and genital warts. Their high prevalence in this study highlights the importance of monitoring even the least dangerous HPV strains due to their potential to affect patients' reproductive health.

The HPV-42 genotype was the second most frequent, with an incidence of 33.3%. Like HPV-43, this genotype is associated with benign lesions and rarely leads to cervical cancer. However, its presence is significant in a third of cases (see Table 3).

Finally, the HPV-11 genotype showed an incidence of 16.7%. Although HPV-11 is less prevalent than genotypes 43 and 42, it is still significant due to its association with genital warts. The detection of this genotype in a significant portion of the sample highlights the importance of including low-risk HPV testing in screening and prevention programs, as although these genotypes do not usually cause cancer, they can lead to other health complications that affect patients' quality of life.

The table below shows the relationship observed between the different HPV genotypes and the cytological lesions identified in the sample of 30 students from the different careers described above. Cytological lesions were classified according to the Bethesda criteria, which include Bethesda Negative, ASC-US (typical cells of unknown significance), L-SIL (basic intraepithelial squamous cell disease) and ASC-H (typical cells without discernible intraepithelial squamous cell disease).

An analysis of the relationship between HPV genotypes and cytological lesions revealed some significant associations. The HPV 16 and HPV 18 genes, known for their high risk of cancer, were found in several types of lesions. HPV 18 was found in Bethesda Negative, ASC-US, L-SIL, and ASC-H cases, indicating its widespread involvement in various stages of cervical injury progression.

The HPV 31 and HPV 33 genotypes also had a high prevalence in ASC-US and L-SIL lesions, indicating their potential role in low-grade lesions that could progress to more severe conditions if not properly treated. These findings are consistent with previous studies that have identified these genes as factors.

In addition, low-risk genes such as HPV 11, HPV 42, and HPV 43 were found primarily in low-grade lesions (L-SIL). Although these genotypes rarely cause cancer, their detection highlights the importance of ongoing follow-up to avoid complications. Thus, the observed relationship between the various HPV genotypes and cytological lesions underscores the need for an integrated strategy in the prevention and treatment of HPV infections. Early detection and accurate characterization of current genotypes can lead to more informed clinical decisions

and improve patient outcomes.

Each number in the table represents the number of cases detected for a specific HPV genotype within a lesion category. The study revealed that HPV genes 16, 18, 39 and 82 were detected in cases with negative Bethesda results. HPV genes 18, 26, 31, 33, 35, 39, 51, 52, 53, 56, 58, 59, 66, and 81 were found in ASC-US lesions (typical squamous cells of unknown significance). L-SIL lesions (low-grade squamous intraepithelial lesion) were associated with HPV genotypes 11, 16, 18, 31, 33, 35, 42, 43, 45, 58, 66, 68, 73. HPV genotypes 18 and 35 were identified for ASC-H lesions (atypical squamous cells with a high-grade squamous intraepithelial lesion). Finally, it was observed that H-SIL (high-grade squamous intraepithelial lesion) was associated with genotypes.

In addition, the presence of reactive endocervical cells and ASC-US was associated with HPV genes 31, 56 and 58. These findings highlight the variety of HPV genotypes found in various types of skin lesions, emphasizing the importance of accurate HPV classification for appropriate clinical management and effective prevention strategies.

Discussion.

A total of 124 students are enrolled in various programs of the Faculty of Health Sciences of the National University of Chimborazo. The results show a significant increase in cytological lesions, which are classified according to their level of abnormality. Calderón [14] mentions that intraepithelial lesions can develop in the squamous epithelium of the cervix, which can progress to cervical cancer if left untreated [15]. Risk factors include early sexual activity, having multiple sexual partners, and lack of barrier contraceptives [16]. In addition, the lack of tamoxifen testing increases the risk, as many women have never had them or have done so in more than five years.

The study revealed that the most prevalent HPV genotypes in female students of the Faculty of Health Sciences of the National University of Chimborazo are HPV 18, HPV 31, HPV 33, HPV 58 and HPV 66. These genotypes showed a strong association with different degrees of cytological lesions [17]. HPV 18, for example, was detected in multiple lesion types, including Bethesda Negative, ASC-US, L-SIL, and ASC-H, indicating its ability to be present at various stages of cervical lesion progression. HPV 31 and HPV 33 genotypes were frequent in ASC-US and L-SIL lesions, suggesting their involvement in low-grade lesions with the potential to progress to more severe conditions if not adequately treated. These findings underscore the importance of these genotypes in HPV epidemiology and the need for ongoing monitoring [18].

According to Venegas [19] the risk of HPV infection is highest in young people who start sexual life at an early age, and the highest risk is between the ages of 35 and 40. Infection in young women is usually short-lived, so follow-up and observation are recommended. The study conducted revealed that most of the cognitive injuries were mild, and that 13.7% had ASC-US. According to the National Cancer Institute, this type of lesion indicates abnormal cells caused by HPV or other factors. L-SIL lesions were less frequent, thus, Lacruz and Farina [20] suggest that these changes usually go away without treatment but can sometimes become cancerous [21].

Peña et al. [22] They found that 25.7% of L-SIL patients developed H-SIL in 28% of cases. Although progression to high-grade injuries is slow, it is still significant. Finally, 0.8% of the lesions were ASC-H, and in these cases, Hernández-Tiria [23] Colposcopy-guided biopsies are recommended due to the risk of progression to cervical cancer, up from 1.49%.

The analysis showed significant differences in the incidence of cytological lesions between low- and high-risk HPV genotypes. High-risk genotypes, such as HPV 18, HPV 31, and HPV 33, were associated with a variety of lesions, from ASC-US to ASC-H, and showed a higher incidence of progression to high-grade lesions (H-SIL). In contrast, low-risk genotypes, such as HPV 11, HPV 42, and HPV 43, were predominantly associated with low-grade lesions (L-SIL). Although these low-grade lesions are usually benign and disappear without treatment, their presence highlights the need for vigilance, as they can evolve into rare cases [24,25]. The difference in lesion incidence and progression underscores the importance of properly classifying genotypes to implement targeted prevention and treatment strategies [5]. HPV-18 is the most common high-risk HPV infection among health science students. This genotype is thought to be oncogenic and responsible for 70% of cervical cancer cases.

A study of 30 women with cancerous and precancerous lesions was conducted to determine their genotype. According to Rivera [5], HPV-18 is the most common high-risk HPV infection among health science students. This genotype is thought to be oncogenic and responsible for 70% of cervical cancer cases.

According to the WHO37, HPV-31 and HPV-33 are the second most common, responsible for 15% of cervical cancers, with HPVs 31, 33, 39, 45, 51, 56, 58 and 59, which were also found in our study. This classifies them as biological carcinogens. In addition, HPV 26 and 73 [26], have been identified as carcinogenic, although they have a low prevalence due to the possibility of high risk of oncogenesis and association with uterine cancer [27].

The rationale of the study is the identification of HPV genotypes in cervical samples from women with various types of cervical lesions. The HPV test is done by identifying the DNA of the virus in a sample of cervical tissue. An additional test may be performed to identify the specific genotype of the virus if high-risk HPV DNA is detected [2].

The results of the study indicate a correlation between various HPV markers and various types of cervical lesions. For example, HPV genotypes 16, 18, 39, and 82 are associated with a negative Bethesda result, meaning that no abnormal cellular changes were observed in the cervical tissue sample [28]. However, if ASC-US lesions (small cells, characteristically absent and of unclear significance) are observed, they are associated with the presence of high-risk HPV markers such as 18, 26, 31, 33, 35, 39, 51, 52, 53, 56, 58, 59, 66, and 81.

Low-grade intraepithelial lesions suggestive of HPV, or L-SIL lesions, are associated with high-risk HPV genotypes, such as 11, 16, 18, 31, 33, 35, 42, 43, 45, 58, 66, 68, and 73. ASC-H lesions (short hairy ataxias that can be precancerous) are associated with high-risk HPV markers, such as 18, 35, and 51. Finally, ASC-US cells and endocervical reactive cells are associated with low-risk HPV markers such as 31, 56, and 58.

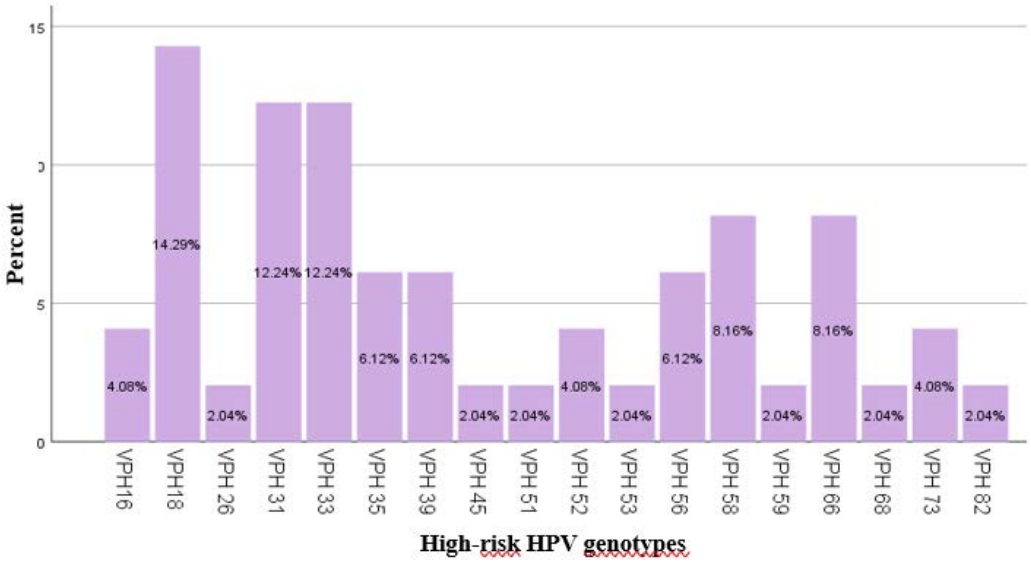

Figure 1. *Prevalence of high-risk HPV genotypes in students.*

Combining cytological information with the identification of HPV genotypes significantly improves diagnostic accuracy and risk stratification in the management of cervical cancer. Cytological detection makes it possible to identify cellular abnormalities that indicate the presence of HPV infections, while specific genotyping provides critical information about the types of HPV present and their oncogenic potential. For example, detection of high-risk genotypes such as HPV 18 and HPV 31 in specific cytological lesions (ASC-US and L-SIL) allows for better prediction of the risk of progression to high-grade lesions and cervical cancer. This combined approach enables healthcare professionals to make more informed clinical decisions, facilitating early, personalized interventions for at-risk patients [15,29].

Conclusion.

According to the results obtained, it was possible to distinguish the incidence of cytological lesions in a population of 124 patients, representing 100% of the sample. The lesion distributions were as follows: Bethesda Negative accounted for 75.8% of the lesions, ASC-US 13.7%, L-SIL 8.1%, H-SIL 1.6%, and ASC-H only 0.8%. These figures indicate that combined low- and high-grade lesions account for 24.2% of all cytological lesions. The high prevalence of negative results suggests a low incidence of severe cytological lesions in the population studied but highlights the importance of continuous detection and monitoring.

The genotyping results showed that the prevalence of HPV strains is high in the population studied, with a significant distribution of both high- and low-risk genotypes. HPV 18 was the most prevalent high-risk genotype, followed by HPV 31 and HPV 33 genotypes. In terms of low-risk genotypes, HPV 43 had the highest incidence. These findings underscore that although HPV infection is common, only a small percentage of these infections progress to cervical cancer, usually due to the persistence of high-risk strains. Therefore, regular screening and follow-up are essential for the early identification and treatment of precancerous lesions.

The finding of the study in question was the precise identification of the HPV genotypes predominant in the population of university students and their specific association with different degrees of cytological lesions. This knowledge provides a solid foundation for future research focused on risk stratification and the development of more effective preventive and therapeutic strategies. It is recommended that future research continue to explore the dynamics of persistence and elimination of HPV infections, as well as the impact of early interventions on cervical cancer prevention.

REFERENCES

1. Sequera MA, Matamoros A, Mendoza León MJ. Genotipos de VPH y cambios citológicos cervico-uterino en pacientes de una consulta ginecológica privada del Estado Carabobo, Venezuela. Marzo-octubre de 2017. Revista Médica de Risaralda. 2020;26.
2. Minchalo Muñoz DJ, Oleas Seminario HL, Bigoni Ordóñez GD. Prevalencia de los Genotipos del Virus del Papiloma Humano en mujeres de 25 a 65 años. Oncología (Ecuador). 2020;30:39-52.
3. Naranjo I, Naranjo A, Quinteros A, et al. Nuevos paradigmas en el tamizaje del cáncer de cuello uterino: costo-efectividad del screening primario de la prueba del virus de Papiloma Humano vs. citología cervicovaginal. La ciencia al servicio de la salud y la nutrición. 2019;10:68-76.
4. Agorastos T, Chatzistamatiou K, Katsamagkas T, et al. Primary screening for cervical cancer based on high-risk human papillomavirus (HPV) detection and HPV 16 and HPV 18 genotyping, in comparison to cytology. PLoS One. 2015;10: e0119755.
5. Rivera A. Several works on Human Papilloma Virus in Ecuador. INSPILIP. 2018;5:1-22.
6. Dang X, Lu Q, Li J, et al. Exploring the potential prompting role of cervical human papilloma virus detection in vulvar lesions: a cross-sectional study in China. Front Oncol. 2024;14:1353580.
7. Van Doorslaer K, Li Z, Xirasagar S, et al. The Papillomavirus Episteme: A major update to the papillomavirus sequence database. Nucleic Acids Res. 2017;45:D499-D506.

8. Muñoz N, Xavier Bosch F, de Sanjosé S, et al. Epidemiologic Classification of Human Papillomavirus Types Associated with Cervical Cancer. N Engl J Med. 2003;348:518-545.
9. Rosário A, Sousa A, Marinho-Dias J, et al. Impact of high-risk Human Papillomavirus genotyping in cervical disease in the Northern region of Portugal: Real-world data from regional cervical cancer screening program. J Med Virol. 2023;95:e28414.
10. Oyervides-Muñoz MA, Pérez-Maya AA, Sánchez-Domínguez CN, et al. Multiple HPV infections and viral load association in persistent cervical lesions in Mexican women. Viruses. 2020;12:380.
11. Zamurovic M, Tomic A, Pikula A, et al. Understanding the Dynamics of Human Papillomavirus and Diagnostic Discrepancies in Cervical Pathology: A Single Center Experience. Diagnostics. 2023;13:3614.
12. Rodríguez Navas PM, Simelio N, Corco y Ruiz M. Metodologías de evaluación de la transparencia: procedimientos y problemas. Revista Latina de Comunicación Social. 2017;72:818-831.
13. Mohammad N. Metodología de la investigación. 2000.
14. Calderón D. Diagnóstico y tratamiento de las lesiones intraepiteliales escamosas de alto grado del cuello uterino. CAMBIOS. 2019;18:76-84.
15. Andujar M, Roura E, Torres A, et al. Prevalence and genotype distribution of cervical human papilomavirus infection in the pre-vaccination era: A population-based study in the Canary Islands. BMJ Open. 2020;10.
16. Song F, Yan P, Huang X, et al. Roles of extended human papillomavirus genotyping and multiple infections in early detection of cervical precancer and cancer and HPV vaccination. BMC Cancer. 2022;22:42.
17. Kim M, Park NJY, Jeong JY, et al. Multiple human papilloma virus (Hpv) infections are associated with hsil and persistent hpv infection status in korean patients. Viruses. 2021;13.
18. Dickson EL, Vogel RI, Geller MA, et al. Cervical cytology and multiple type HPV infection: A study of 8182 women ages 31-65. Gynecol Oncol. 2014;133:405-408.
19. Venegas G, Bendezu-Quispe G, Urrunaga-Pastor D, et al. Factores asociados al resultado citológico positivo en pruebas de Papanicolau en mujeres atendidas en la Liga Peruana de Lucha contra el Cáncer. Rev. Cuerpo Med. HNAAA. 2022;14:485-490.
20. Lacruz C, Fariña J. Citología ginecológicade Papanicolaou a Bethesda. Editorial Complutense. 2003.
21. Voidăzan TS, Budianu MA, Rozsnyai FF, et al. Assessing the Level of Knowledge, Beliefs and Acceptance of HPV Vaccine: A Cross-Sectional Study in Romania. Int J Environ Res Public Health. 2022;19.
22. Peña M, Cobalea M, González E. Repercusión de las lesiones precursoras del cáncer de cérvix relacionadas con el virus de papiloma humano en nuestra población. Prog Obstet Ginecol. 2022;65:132-139.
23. Hernández-Tiria C, Camila M, Fidel M. Revista Colombiana de Obstetricia y Ginecología. Rev Colomb Obstet Ginecol. 2015;66:2006-2013.
24. Tao X, Austin RM, Yu T, et al. Risk stratification for cervical neoplasia using extended high-risk HPV genotyping in women with ASC-US cytology: A large retrospective study from China. Cancer Cytopathol. 2022;130:248-258.
25. Soto-De Leon S, Camargo M, Sanchez R, et al. Distribution patterns of infection with multiple types of human papillomaviruses and their association with risk factors. PLoS One. 2011;6:e14705.
26. Mateos-Lindemann ML, Pérez-Castro S, Rodríguez-Iglesias M, et al. Microbiological diagnosis of human papilloma virus infection. Enfermedades Infecciosas y Microbiologia Clinica. 2017;35:593-602.
27. Luo Q, Zeng X, Luo H, et al. Epidemiologic characteristics of high-risk HPV and the correlation between multiple infections and cervical lesions. BMC Infect Dis. 2023;23:667.
28. Li Y, Wang H, Zhang Y, et al. Correlation between multi-type human papillomavirus infections and viral loads and the cervical pathological grade. International Journal of Gynecology and Obstetrics. 2021;152:96-102.
29. Koliopoulos G, Nyaga VN, Santesso N, et al. Cytology versus HPV testing for cervical cancer screening in the general population. Cochrane Database of Systematic Reviews. 2017;8:CD008587.

Резюме:

Цель исследования: Целью данного исследования было оценить распространенность генотипов вируса папилломы человека (ВПЧ) и их связь с различными классами цитологических поражений у студенток факультета наук о здоровье Национального университета Чимборасо. Материал и методы: Исследование имеет количественный и описательный подход, со сравнительным анализом генотипов ВПЧ и цитологических поражений у студенток факультета медицинских наук. Это экспериментальное и полевое исследование, перекрестное и ретроспективное, проведенное с ноября 2023 года по март 2024 года. Тридцать студентов были отобраны методом квотной выборки, проведен анализ обычной цитологии и данных с помощью SPSS 26. Результаты показали, что 75,8% образцов имели отрицательный результат по Бетесда, в то время как 24,2% имели ту или иную степень цитологического поражения (ASC-US 13,7%, L-SIL 8,1%, H-SIL 1,6% и ASC-H 0,8%). Генотипирование показало высокую распространенность ВПЧ, причем наиболее частыми генотипами высокого риска были ВПЧ 18 и 33. Наиболее распространенными показателями низкого риска были ВПЧ 43 и 42. Выводы: Исследование подтвердило высокую распространенность ВПЧ среди студенток университета и установило значительную корреляцию между генотипами высокого риска и наличием более тяжелых цитологических поражений. Полученные данные подчеркивают необходимость проведения мероприятий, направленных на профилактику и раннее лечение ВПЧ, особенно в популяциях высокого риска.

რეზიუმე

კვლევის მიზანი: ამ კვლევის მიზანი იყო ადამიანის პაპილომავირუსის (HPV) გენოტიპების პრევალენტობის შეფასება და მათი კავშირი სხვადასხვა ხარისხის ციტოლოგიურ დაზიანებებთან ჩიმბორაზოს ეროვნული უნივერსიტეტის ჯანდაცვის მეცნიერებათა ფაკულტეტის ქალ სტუდენტებში. მასალა და მეთოდები: კვლევას აქვს რაოდენობრივი და აღწერილობითი მიდგომა, HPV გენოტიპებისა და ციტოლოგიური დაზიანებების შედარებითი ანალიზით ჯანდაცვის მეცნიერებათა ფაკულტეტის სტუდენტებში. ეს არის ექსპერიმენტული და საველე კვლევა, ჯვარედინი და რეტროსპექტიული კვლევა, რომელიც ჩატარდა 2023 წლის ნოემბრიდან 2024 წლის მარტამდე. ოცდაათი სტუდენტი შეირჩა კვოტური შერჩევით, ჩვეულებრივი ციტოლოგიისა და მონაცემების ანალიზით SPSS 26-ის გამოყენებით. შედეგებმა აჩვენა, რომ ნიმუშების 75.8%-ს ჰქონდა Bethesda. უარყოფითი შედეგები, მაშინ როცა 24.2%-ს ჰქონდა ციტოლოგიური დაზიანების გარკვეული ხარისხი (ASC-US 13.7%, L-SIL 8.1%, H-SIL 1.6% და ASC-H 0.8%). გენოტიპმა აჩვენა HPV-ის მაღალი გავრცელება, HPV 18 და 33 ყველაზე გავრცელებული მაღალი რისკის გენოტიპებია. ყველაზე გავრცელებული დაბალი რისკის მაჩვენებლები იყო HPV 43 და 42. დასკვნები: კვლევამ დაადასტურა HPV-ის მაღალი გავრცელება უნივერსიტეტის სტუდენტებს შორის და დაადგინა მნიშვნელოვანი კორელაცია მაღალი რისკის გენოტიპებსა და უფრო მძიმე ციტოლოგიური დაზიანებების არსებობას შორის. ეს დასკვნები ხაზს უსვამს ინტერვენციების აუცილებლობას, რომლებიც მიზნად ისახავს HPV-ს პრევენციასა და ადრეულ მკურნალობას, განსაკუთრებით მაღალი რისკის მქონე პოპულაციებში.