

Prevalence variation of colposcycological abnormalities in adolescents and adults in the years 2000 and 2010

Varição da prevalência de anormalidades colpocitológicas em adolescentes e adultas nos anos de 2000 e 2010

Karina M. P. A. Coelho¹; Giuliano S. Bublitz¹; Paulo Henrique C. França²; Marcio Franciski¹; Jaqueline Stall¹; Hercílio Fronza Júnior¹

1. Centro de Diagnósticos Anatomopatológicos (Cedap)/Serviços Integrados de Patologia (Sip). 2. Universidade da Região de Joinville (Univille).

ABSTRACT

Introduction: Cancer of the cervix is the second most common cancer among women worldwide and the frequency of precancerous lesions is increasing among adolescents. **Objective:** To study and compare the frequency of epithelial abnormalities in cervical cytology exams in adolescents and adults. **Materials and methods:** Retrospective study based on analysis of reports of cytology exams performed in the years 2000 and 2010 in adolescents (12-18 years old) and in adult women. The frequency of cytological alterations was explored, stratifying them into high-grade/carcinoma and low-grade lesions. **Results:** In 2000, rates of epithelial abnormalities were 3.08% in adolescents and 1.39% in adult females, and were 4.76% and 1.83% in 2010, respectively. The high-grade lesions/carcinomas were more common among adults in both years. **Discussion:** There was an increase in prevalence of epithelial abnormalities in the last decade, both in adolescents and in adults. Proportionally, the increase was higher among adolescents (6.7%) than in adults (2.2%). However, the rate of high-grade lesions/carcinoma was higher among adult women in the two analyzed years. **Conclusion:** It was observed that the frequency of cervical epithelial abnormalities was higher among adolescents than adults and increased between 2000 and 2010.

Key words: Pap test; epithelial abnormalities; adolescents; HPV.

INTRODUCTION

Cancer of the cervix is the second most common cancer among women worldwide. Its incidence, of approximately 500 thousand cases per year, is responsible for around 230 thousand annual deaths, with a higher number of reported cases in developing countries. The incidence of cervical cancer begins to rise in the age group of 20-29 years, and the risk increases rapidly to reach a peak, generally in the 45-49 age group, being a rare condition in adolescence^(1,2).

Studies suggest that the frequency of pre-neoplastic lesions has increased among adolescent females. This situation may be justified by the change in behavior patterns of this group, such as the earlier age at first sexual intercourse and the increased number of partners^(3,4). Therefore there is a higher probability of infection by human papillomavirus (HPV), which is the primary

risk factor for the development of invasive cervical cancer. Data from the World Health Organization (WHO) estimate that 25%-30% of the women under 25 years of age may be infected with high-risk HPV^(2,5-9).

HPV infection is one of the most common sexually-transmitted diseases among young women, with a prevalence that may reach 82% in some populations. Most of these infections are eliminated by the immune system within two or three years, but the persistent ones caused by oncogenic viruses (high risk) have the potential to evolve to invasive carcinoma⁽¹⁰⁾.

It is known that adolescents with low-risk intraepithelial lesion rarely develop high-grade lesions or carcinoma^(2,9,11,12). Their risk for the development of invasive carcinoma is low, accounting for less than 0.2% of cervical carcinomas, when diagnosed before the age of 20⁽¹⁰⁾. In addition, recent guidelines from several organizations, including United States Preventive Service Task

Force (USPSTF), American Cancer Society (ACS)/American Society for Colposcopy and Cervical Pathology (ASCCP)/American Society for Clinical Pathology (ASCP) and American College of Obstetricians and Gynecologists (ACOG), recommend that cervical screening begin at age 21 years⁽¹³⁾.

OBJECTIVE

The objective of this study was to assess the frequency of epithelial abnormalities in cervical cytology exams of adolescent females in 2000 and 2010, and compare them with equivalent data from the adult population and literature data.

MATERIALS AND METHODS

A cross-sectional retrospective observational study was conducted based on results of cervical cytology tests at Centro de Diagnósticos Anatomopatológicos (Cedap)/Serviços Integrados de Patologia (Sip), in Joinville-SC, which serves public and private hospitals. A total of 94,936 cervical cytology reports were analyzed: 31,078 from 2000 and 63,858 from 2010. The examined reports included conventional and liquid-based cytology tests, stained by Papanicolaou method. Results from patients with previous exams indicating abnormalities were also considered, and those with unsatisfying results were excluded.

The presence of epithelial abnormalities was assessed, including low-grade squamous intraepithelial lesion (LSIL), high-grade squamous intraepithelial lesion (HSIL), carcinoma and adenocarcinoma. These are described according to the criteria defined by Nomenclatura Brasileira para Laudos de Colpocitologia (the Brazilian Nomenclature for Cervical Cytology Reporting)⁽¹⁴⁾.

Patients aged 12-18 years were considered adolescents, as established by the Brazilian Child and Youth Statute; those aged 19 or over were considered adults. The frequency of cytological alterations of adolescents was compared with that of adult patients and the relationship between them was studied.

The obtained data were retrieved from the proprietary laboratory information system. Proportions were tested by the chi-squared method, and the considered level of significance was lower than 0.05.

The research project was approved by the Research Ethics Committee of Hospital Municipal São José, in Joinville-SC (report 161.733 of November 2012).

RESULTS

Among the 94,936 cytology tests analyzed in 2000 and 2010, 2,132 were from adolescents. In 2000, 31,078 cervical cytology reports were assessed, with 746 from adolescents; 23 were diagnosed with epithelial abnormalities, accounting for 3.08%. In that same year, 30,332 exams of adult patients were recorded, with 422, that is, 1.39%, presenting epithelial abnormalities (**Table 1**). Among the 63,858 exams assessed in 2010, 1,386 were from adolescents, and 66 of them had diagnosis of epithelial abnormality, what accounts for 4.76%. In the group of adult females, 62,472 exams were recorded, with 1,142 (1.83%) presenting abnormalities (Table 1).

The increased number of adult women with lesions, when comparing both years, is statistically significant. However, the difference between adolescents with lesion when comparing the different years is not statistically significant, in spite of a tendency of increase in the number of cases in this group: from 3.08% to 4.76%. Besides, the percentage difference of epithelial abnormalities between the groups of adolescents and adults is statistically significant, both in 2000 ($p < 0.001$) and in 2010 ($p < 0.001$).

Epithelial abnormalities were stratified into two groups. The first included low-grade epithelial lesions; the second, high-grade intraepithelial lesions and carcinomas. Both groups were subdivided by population (adolescents and adults), and by year (2000 and 2010).

In 2000, among the adolescents, 22 results of low-grade intraepithelial lesions and one result of high-grade intraepithelial lesion were recorded. In the same year, among the adults, 308 patients with low-grade intraepithelial lesion and 114 with high-grade intraepithelial lesion or carcinoma were found (**Table 2**).

In 2010, 65 adolescents with low-grade intraepithelial lesion and only one with high-grade intraepithelial lesion were recorded.

TABLE 1 – Comparison of cervical cytology test reports, with and without lesion, from adolescent and adult women in 2000 and 2010

Population	Presence of lesion	2000	2010	<i>p</i>
Adolescents	Yes	23 (3.08%)	66 (4.76%)	NS
	No	723	1,320	-
Adults	Yes	422 (1.39%)	1,142 (1.83%)	< 0.001
	No	29,910	61,330	-
Total		31,078	63,858	

NS: not significant.

TABLE 2 – Classification of epithelial abnormalities detected in cervical cytology tests from adolescent and adult women in 2000 and 2010

Year	Abnormality	Adolescents	Adults	<i>p</i>
2000	High grade/carcinoma	1	114	0.04
	Low grade	22	308	
2010	High grade/carcinoma	1	358	< 0.001
	Low grade	65	784	

In the same year, among adults, 784 results were low-grade intraepithelial lesion and 358 were high-grade intraepithelial lesion or carcinoma (Table 2).

Results did not diverge significantly when both decades were compared. Nonetheless, both in 2000 and in 2010, adult women presented significantly increased prevalence of high-grade lesion or carcinoma, in comparison with the group of adolescents (Table 2).

DISCUSSION

As observed in the present study, the frequency of cytological epithelial abnormalities in adolescent females is higher than in adult females, what has been reported in the literature⁽⁹⁾. In this study, though, both in 2000 and in 2010, adult women presented a significantly increased prevalence of high-grade lesion or carcinoma in relation to the group of adolescents. Variation in epithelial lesion prevalence among the adolescent population in the last years has not been openly reported.

This study observed an increased prevalence of cervical cytology tests with epithelial abnormalities among adolescents when reports of 2000 and 2010 were compared. Proportionally, there was a 6.7% increase in abnormality rates among adolescents, and just a 2.2% among adult women.

The group of low-grade intraepithelial lesions was the most prevalent in both age groups in both years analyzed in this study. As expected, the group of high-grade lesions was significantly larger in the adult population.

Biomolecular tests for the investigation of the oncogenic HPV type were carried out in 111 adolescents, from 2002 to 2004, in Maceió. A 27% prevalence of positivity was found, with 21.6% of the patients in the age group 15-19 years⁽¹⁵⁾. In Rio de Janeiro, from 1993 to 2003, an 8.4% prevalence of intraepithelial lesions was found in adolescents, with 3% high-

grade lesions, including a case of invasive carcinoma⁽⁷⁾. In Acre, in 2001, a 6.9% rate of cellular epithelial alterations was found in the 15-19 years age group⁽¹⁶⁾.

The high prevalence of cervical epithelial abnormalities among adolescents, observed in our study and described in the literature, reflects the importance of public policies directed towards primary prevention of sexually-transmitted diseases in that population.

Most women should start cervical/vaginal cancer screening at age 21 years. On the other hand, sexually active adolescents, especially those with immune deficiency, should be screened for precursor lesions as soon as associated factors, such as HIV infection, organ transplantation or long-lasting corticosteroid therapy have been observed⁽¹⁷⁻¹⁹⁾. Also, all adolescents should be duly informed about HPV infection and its associated risks.

Bumbulliene *et al.* (2012), in their study with women aged 15-22, confirmed that smoking, early age at first sexual intercourse, multiple partners and unprotected sex are related to high-risk HPV infection⁽²⁰⁾. For this reason, the use of condoms is important for the control of HPV infection and must be recommended to all sexually active adolescents. Besides, vaccination programs may result in a reduction of HPV infections^(18, 21, 22). Cytology screening, in its turn, has not been indicated for patients under 21 due to the low risk of evolution of low-grade to high-grade lesions, according to literature data and the results achieved in this study.

CONCLUSION

The frequency of abnormalities found in this study is proportionally higher among adolescent than among adult females in the population of Joinville and the region around. A tendency of growth in the frequency of cervical cytological alterations was also observed in adolescents when the beginning of the 2000 decade was compared with the beginning of the 2010 decade.

Considering that HPV is a sexually-transmitted virus, it is evident that the group of adolescents needs attention and care aimed at preventing the transmission of this virus and other sexually-transmitted diseases. At the same time, the low percentage of high-grade lesions in this group revealed by this study strengthens the guidelines about cytology screening in women younger than 21 years, found in the current literature.

RESUMO

Introdução: O câncer do colo do útero é o segundo tipo de câncer mais comum entre as mulheres em todo o mundo, e a frequência de lesões pré-neoplásicas vem aumentando entre as adolescentes. **Objetivos:** Estudar e comparar a frequência de anormalidades epiteliais em exames colpocitológicos em adolescentes e adultas. **Materiais e métodos:** Estudo retrospectivo com base na análise de laudos de exames colpocitológicos realizados nos anos de 2000 e 2010 em adolescentes (12 a 18 anos de idade) e em mulheres adultas. A frequência de alterações citológicas foi explorada, estratificando-as em lesões de alto grau/carcinoma e lesões de baixo grau. **Resultados:** Em 2000, as taxas de anormalidades epiteliais foram de 3,08% nas adolescentes e de 1,39% nas mulheres adultas; em 2010, de 4,76% e 1,83%, respectivamente. As lesões de alto grau/carcinoma foram mais frequentes entre as adultas em ambos os anos. **Discussão:** Tanto em adolescentes como em adultas, verificou-se aumento da prevalência de anormalidades epiteliais na última década. Proporcionalmente, o aumento foi maior entre adolescentes (6,7%) do que em adultas (2,2%). No entanto, a taxa de lesões de alto grau/carcinoma foi maior entre as adultas nos dois anos analisados. **Conclusão:** Observou-se que a frequência de anormalidades epiteliais cervicais é maior em adolescentes do que em adultas, tendo aumentado entre os anos de 2000 e 2010.

Unitermos: exame colpocitológico; anormalidades epiteliais; adolescentes, HPV.

REFERENCES

1. Ministério da Saúde. Instituto Nacional de Câncer. Incidência de câncer no Brasil. Rio de Janeiro, 2010 [Internet]. Available at: http://www1.inca.gov.br/estimativa/2010/index.asp?link=conteudo_view.asp&ID=5.
2. Nascimento MI, Pires ES, Gil DQ. Características de um grupo de adolescentes com suspeita de neoplasia intra-epitelial cervical. Rev Bras Ginecol Obstet. 2005; 27(10): 619-26.
3. Hwang LY, Lieberman JA, Ma Y, Farhat S, Moscicki AB. Cervical ectopy and the acquisition of human papillomavirus in adolescents and young women. Obstet Gynecol. 2012; 119(6): 1164-70.
4. Clarke MA, Rodriguez AC, Gage JC. A large, population-based study of age-related associations between vaginal pH and human papillomavirus infection. BMC Infect Dis. 2012; 8(12): 33.
5. Gerhardt CA, Pong K, Kollar LM, Hillard PJ, Rosenthal SL. Adolescents' knowledge of human papillomavirus and cervical dysplasia. J Pediatr Adolesc Gynecol. 2000; 13(1): 15-20.
6. Gonçalves CV, Quintana SM, Marcolin AC. Microinvasive carcinoma of the uterine cervix in a 14-year-old adolescent: case report and literature review. Sao Paulo Med J. 2009; 127(2): 105-7.
7. Monteiro DLM. A cérvix uterina da adolescente: estudo da prevalência e dos fatores associados ao câncer de colo uterino e suas lesões precursoras em população de adolescentes atendidas em hospital público do município do Rio de Janeiro [dissertation]. Rio de Janeiro: Instituto Fernandes Figueira da Fundação Oswaldo Cruz (Fiocruz); 2004.
8. Murta EFC, Souza MAH, Adad SJ, Araújo Júnior E. Infecção pelo papilomavírus humano em adolescentes: relação com o método anticoncepcional, gravidez, fumo e achados citológicos. Rev Bras Ginecol Obstet. 2001; 23(4): 217-21.
9. Pedrosa ML, Mattos IE, Koifman RJ. Lesões intra-epiteliais cervicais em adolescentes: estudo dos achados citológicos entre 1999 e 2005, no município do Rio de Janeiro, Brasil. Cad Saude Publica. 2008; 24(12): 2881-90.
10. Rosa M, Mohammadi A. Cervical cytology and human papillomavirus testing in adolescent women: implications in management of a positive HPV test. Patholog Res Int. 2014; Article ID 165690; 4 p.
11. Crosby R, Rager K, Hanson A, Ribes J. Does knowing about an HPV infection influence behavior change? A feasibility study of females attending a teen clinic. J Pediatric Adolesc Gynecol. 2008; 21(6): 373-6.
12. Etlinger D, Pereira SMM, Oikawa KF. Campanha de prevenção de câncer cervical: estudos no Instituto Adolfo Lutz mostram a necessidade de avaliação na faixa etária. Rev Inst Adolfo Lutz. 2008; 67(1): 64-8.
13. Boardman IA, Robison K. Screening adolescents and young women. Obstet Gynecol Clin North Am. 2013 June; 40(2): 257-68.
14. Ministério da Saúde. Secretaria de Atenção à Saúde. Instituto Nacional de Câncer. Coordenação de Prevenção e Vigilância. Nomenclatura brasileira para laudos cervicais e condutas preconizadas: recomendações para profissionais de saúde. Rio de Janeiro, 2006 [Internet]. Available at: http://bvsms.saude.gov.br/bvs/publicacoes/Nomenclaturas_2_1705.pdf.
15. Barros LDF. Infecção genital por HPV em adolescentes. Diagnóstico biomolecular [dissertation]. Maceió: Universidade Federal de Alagoas; 2006.
16. Leal EAS, Leal Júnior OS, Guimarães MH, Vitoriano MN, Nascimento TL, Costa OLN. Lesões precursoras do câncer de colo em mulheres adolescentes e adultas jovens do município de Rio Branco-Acre. Rev Bras Ginecol Obstet. 2003; 25(2): 81-6.
17. Chen EY, Tran A, Raho CJ, Birch CM, Crum CP, Hirsch MS. Histological 'progression' from low (LSIL) to high (HSIL) squamous intraepithelial lesion is an uncommon event and an indication for quality assurance review. Mod Pathol. 2010; 23(8): 1045-51.

18. Monteiro DL, Trajano AJ, da Silva KS, Russomano FB. Pre-invasive cervical disease and uterine cervical cancer in Brazilian adolescents: prevalence and related factors. *Cad Saude Publica*. 2006; 22(12): 2539-48.
19. Exceptions to Pap screening in adolescents. July 21, 2010. The American College of Obstetricians and Gynecologists [Internet]. Available at: <http://www.acog.org/About-ACOG/News-Room/News-Releases/2010/Exceptions-to-Pap-Screening-in-Adolescents>.
20. Bumbuliene Z, Alisauskas J. Sexual behavior and high-risk human papillomavirus in 15-to 22-year-old Lithuanian women. *Acta Obstet Gynecol Scand*. 2012; 91(4): 511-3.
21. Widdice LE. Human papillomavirus disease in adolescents: management and prevention. *Adolesc Med State Art Ver*. 2012; 23(1): 192-206.
22. Lam JU, Rebolj M, Dugué PA, Bonde J, Von Euler-Chelpin M, Lynge E. Condom use in prevention of human papillomavirus infections and cervical neoplasia: systematic review of longitudinal studies. *J Med Screen*. 2014 Mar; 21(1): 38-50.

MAILING ADDRESS

Karina Munhoz de Paula Alves Coelho
Rua Mário Lobo, 61, 6º andar, Edifício Terraço Center; CEP: 89201-330; Joinville-SC, Brazil; e-mail: karinamunhoz@hotmail.com.