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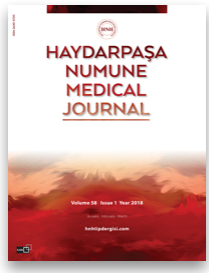

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ORIGINAL ARTICLE

Diagnostic Distribution of Cervicovaginal Smear in Bursa and Its Surrounding

Taşkın Erkinüresin[1], Esra Kartal[2], Yasin Altekin[2], Muzaffer Temur[2], Hakan Demirci[3], Emin Üstünyurt[2]

[1]Department of Pathology Health Sciences University, Bursa Yüksek İhtisas Training and Research Hospital, Bursa, Turkey
[2]Department of Gynecology and Obstetrics Health Sciences University, Bursa Yüksek İhtisas Training and Research Hospital, Bursa, Turkey
[3]Department of Family Medicine Health Sciences University, Bursa Yüksek İhtisas Training and Research Hospital, Bursa, Turkey

Abstract

Introduction: In this study, our aim was to analyze Pap smear cervical cancer screening results at our hospital. We also sought to compare our ASC/SIL rate with the relevant studies in the literature, which is one of the quality standard criteria for the pathology laboratory.

Methods: In our study, digital reports of 6902 cases diagnosed according to the Bethesda Reporting System for Pap cervical cancer screening and other medical indications in the pathology department of our hospital between 1st January 2018 and 31st December 2018 were reviewed retrospectively.

Results: When 6902 cervicovaginal smear cases were analyzed concerning epithelial abnormality, 6528 cases (94.6%) were reported as NILM, and seven cases (0.1%) were reported as an inadequate smear. Epithelial abnormality was detected in the remaining 367 (5.3%) cases. Out of 367 cases,279 (4.0%) of them were reported as ASC-US;42 cases (0.6%) as AGC-NOS;24 cases (0.3%) as LSIL;12 cases (0.2%) as ASC-H, seven cases (0.1%) as HSIL; one case (0.0%) as LSIL and AGC-NOS; one case (0.0%) as ASC-H and AGC-NOS and one case (0.0%) as squamous cell carcinoma (SCC). The ASC/SIL rate of our laboratory for the year 2018 was 9.125.

Discussion and Conclusion: Our SCC rate was 0.02%, which was the second-lowest rate in the relevant literature. The reason for this may be the success of the cervicovaginal Pap smear screening program performed in our region. Our inadequate cervicovaginal smear rate concerning assessment was the lowest rate in the literature. Our ASC/SIL rate was 9.125, and this was the third highest ASC/SIL rate in the literature. The reason for our laboratory's 2018 ASC/SIL rate of 9.125 may be the concern of some of our pathologists of false-negative reports. We detected various differences between epithelial abnormality and infection prevalence in the cervicovaginal smears in our region and epithelial abnormality and infection prevalence in different regions of the world. Intra-departmental case presentations and in-service training could be organized to keep the ASC/SIL rate in the pathology laboratory under three. At the same time, pathologists' quarterly ASC/SIL rates could be calculated and reported to the pathologists.

Keywords: ASC/SIL ratio; cervical cancer screening; cervicovaginal infections; epithelial abnormalities; Pap smear

As of 2018, cervical carcinoma was the fourth most common type of cancer among women in the world, and also the eighth most common cancer in the society[1], whereas in Turkey, it is the eighth most common and mortal type of cancer both among women and in the society [2].

The incidence of cervical carcinoma is much higher in developing countries due to the limited utilization of cervical Pap smear screening tests [2–5]. Cervical carcinoma develops at the end of a long precancerous stage (10-40 years) [2, 5–8]. Thus, this rate has been decreasing in devel-

Correspondence (İletişim): Taşkın Erkinüresin, M.D. Sağlık Bilimleri Üniversitesi, Bursa Yüksek İhtisas Eğitim ve Araştırma Hastanesi, Patoloji Bölümü, Bursa, Turkey
Phone (Telefon): +90 505 737 61 92 **E-mail (E-posta):** erkinuresin@hotmail.com
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oped countries thanks to extensive and systematic cervical smear screening programs [2, 5–8]. Nowadays, although false-negative rates vary between 2% and 50% in different centers, the Pap smear cervical cancer screening test is still accepted as the most effective method to detect precancerous lesions [2]. Cervical cancer screening with Pap smear is a cheap and easily applicable test [8]. As a result of Pap smear utilization, which was first applied by George Papanicolaou and recommended as a screening test by the American Cancer Society in 1945, a considerable decrease has been achieved in cervical cancer incidence and mortality rates by early diagnosis of precancerous lesions [2, 5, 6, 9]. Regular Pap smear cervical cancer screening decreases cancer risk at a rate of approximately 60-80% [8].

The most commonly used and widely accepted classification system in reporting cervical smear samples is the Bethesda Reporting System [9, 10]. In the literature, atypical squamous cells of undetermined significance (ASC-US) are the most common epithelial abnormality seen in cervical smear reports [5, 9]. This is followed in the second rank by low grade squamous intraepithelial lesions (LSIL) [4].

The present study aimed to analyze Pap smear cervical cancer screening results from our hospital. In addition, we set out to compare our ASC/SIL rate with the literature, which is one of the quality standard criteria for the pathology laboratory.

Materials and Methods

Ethics committee approval for this research was obtained from the Clinical Research Ethics Committee of our hospital. After providing women, who were admitted to the Gynecology and Obstetrics Polyclinic of our hospital, with the detailed information about Pap smear cervical cancer screening, they were asked to sign a consent form. Then, a clinician obtained a sampling from the transformation zone of the cervix with a smear brush in the BD SurePath liquid-based thin layer smear kit, and the detachable head of the brush with the sample was detached and left in fixative in the special sample container without being contaminated. Sample containers were sent to our hospital's pathology department. In the pathology department, liquid-based thin layer smear lam preparation was prepared from each of the sample containers in the BD SurePath liquid-based thin layer smear machine. Lam preparations were stained with Papanicolau EA50, then, covered with plastic film in the covering machine and examined under a microscope by the pathologists. Final reports were written according to the Bethesda Reporting System, which was updated in 2014, and they were then given to the patients. Reports were archived both as hard copy and digitally.

In our study, digital reports of 6902 cases diagnosed for Pap cervical cancer screening and other medical indications in the University of Health Sciences Bursa Yuksek Ihtisas Training and Research Hospital Pathology Department according to the Bethesda Reporting System, which was updated in 2004, between 1st January 2018 and 31st December 2018 were reviewed and assessed retrospectively. Data in the pathology reports from the digital archive were transferred to an excel table and analyzed using the SPSS version 22 package program.

Results

The mean age of all cases was 41.56±11.79 (minimum 14 and maximum 92), and the median age was 41. When 6902 cervicovaginal smear cases were analyzed concerning epithelial abnormality, 6528 cases (94.6%) were reported as negative for malignancy or intraepithelial lesion (NILM) and seven cases (0.1%) were reported as an inadequate smear to assess epithelial abnormality due to low squamous cellularity. Epithelial abnormality was detected in the remaining 367 cases (5.3%). Two hundred and seventy-nine out of these 367 cases (4.0%) were reported as ASC-US, 42 cases (0.6%) as atypical glandular cells not otherwise specified (AGC-NOS); 24 cases (0.3%) as LSIL;12 cases (0.2%) as atypical squamous cells, cannot exclude high grade squamous intraepithelial lesion (ASC-H), seven cases (0.1%) as high-grade squamous intraepithelial lesion (HSIL), one case (0.0%) as LSIL and AGC-NOS, one case (0.0%) as ASC-H and AGC-NOS and one case (0.0%) as squamous cell carcinoma (SCC) (Table 1). In addition, the atypical squamous cell/squamous intraepithelial lesion (ASC/SIL) rate was 9.125.

Table 1. Epithelial abnormality diagnostic distribution of 6902 liquid-based thin layer cervicovaginal smears in our hospital between 1st January 2018-31st December 2018

Cervicovaginal Smear Epithelial Abnormality Diagnostic Distribution	n	%
NILM	6528	94.6
ASC-US	279	4.0
AGC-NOS	42	0.6
LSIL	24	0.3
ASC-H	12	0.2
HSIL	7	0.1
Inadequate sample	7	0.1
LSIL and AGC-NOS	1	0.0
ASC-H and AGC-NOS	1	0.0
SCC	1	0.0
Total	6902	100

When 6902 cervicovaginal smear cases were examined concerning infection, no infection was detected in 5735 (83.1%) of the cases; however, there was infection in the remaining 1167 (16.9%) cases. In this study, 945 out of the 6902 cases (13.7%) had flora changes that resembled bacterial vaginosis, 143 cases (2.1%) had fungal organisms morphologically consistent with Candida species, 59 cases (0.9%) had bacteria morphologically consistent with Actinomyces species, nine cases (0.1%) had shift in flora suggestive of bacterial vaginosis and fungal organisms morphologically consistent with Candida species, two cases (0.0%) had fungal organisms morphologically consistent with Candida species and bacteria morphologically consistent with Actinomyces species, and two cases (0.0%) were reported as Trichomonas vaginalis. Seven cases (0.1%) could not be interpreted concerning infection due to the unsatisfactory conditions for evaluation (Table 2).

When 6902 cervicovaginal smear cases were analyzed regarding inflammation status, inflammation was detected in 3830 (55.5%) of the cases and inflammation did not exist in 3065 (44.4%) of the cases. Seven cases (0.1%) could not be interpreted concerning inflammation due to unsatisfactory conditions for evaluation (Table 3).

When 6902 liquid-based thin layer cervicovaginal smear cases were analyzed for atrophy status, atrophy was detected in 823 (11.9%) of the cases, and there was no atrophy in 6072 (88.0%) of the cases. Seven cases (0.1%) could not be interpreted concerning atrophy due to unsatisfactory for evaluation (Table 4). There was inflammation in 94.2% of the liquid-based thin layer cervicovaginal smear cases showing atrophy findings (atrophic vaginitis). There was no inflammation in the remaining 5.8%.

Table 2. Diagnostic distribution of 6902 liquid-based thin layer cervicovaginal smears in our hospital between 1st January 2018-31st December 2018 in terms of infection

Infection Status	n	%
No infection	5735	83.09
Bacterial vaginosis	945	13.69
Candidiasis	143	2.07
Actinomycosis	59	0.86
Bacterial vaginosis and candidiasis	9	0.13
Inadequate sample	7	0.10
Candidiasis and actinomycosis	2	0.03
Trichomonas vaginalis	2	0.0
Total	6902	100

Table 3. Inflammation status of 6902 liquid-based thin layer cervicovaginal smears in our hospital between 1st January 2018-31st December 2018

Inflammation status	n	%
Inflammation/Yes	3830	55.5
Inflammation/No	3065	44.4
Inadequate sample	7	0.1
Total	6902	100

Table 4. Atrophy status of 6902 liquid-based thin layer cervicovaginal smears in our hospital between 1st January 2018-31st December 2018

Atrophy status	n	%
Atrophy/No	6072	88.0
Atrophic vaginitis	775	11.2
Atrophy findings	48	0.7
Inadequate sample	7	0.1

Discussion

In the literature, epithelial abnormality (ASC-US, LSIL, ASC-H, HSIL, AGC-NOS, SCC, adenocarcinoma) rates are quite variable in the cervicovaginal smear case studies reported according to the Bethesda reporting system. Epithelial abnormality rates varied between 1.20% (Özer et al. and Hakverdi et al.) and 10.60% (Bojgua et al.)[2–6, 9, 11–13]. Our epithelial abnormality rate was 4.6%, which was consistent with the literature.

ASC-US, which is the most commonly reported epithelial abnormality, varies between 0.67% (Özer et al.) and 8.04% (Bojgua et al.) in the literature [2–6, 9, 11–13]. Our ASC-US rate was 4.0% and was a little bit higher compared to the literature. We assume that the underlying reason for this may be the concern of some of our pathologists' false-negative reports. Thus, the ASC-US diagnostic result may be being used with the least doubt. We suggest that the ASC-US diagnostic results are used in cases that do not completely meet the LSIL diagnostic criteria, although they resemble them. Intradepartmental case presentations, participation in related in-service training programs and branching could provide a solution for this situation. Calculating and reporting the ASC/SIL rates of each pathologist in quarterly periods within the framework of quality standards could help to decrease our ASC-US rate.

SCC rates vary between 0.01% (Arslan et al.) and 1.40% (Bukhari et al.) in the literature [2–6, 9, 11–13].Our SCC rate was 0.02% and was the second lowest rate in the literature. The reason for this is likely to be the success of the cervicovaginal smear screening program in our region.

Our inadequate cervicovaginal smear rate in terms of

assessment was the lowest rate in the literature, which was0.1%. The reason for this low rate is likely to be the use of a liquid-based thin layer cytology technique. Rates in other centers vary between 0.8% (Arslan et al.) and 8.91% (Patel et al.) [2–6, 9, 11–13].

In the literature, AGC-NOS rates vary between 0.04% (Özer et al.) and 0.4% (Bukhari et al. and Erdem et al.) [2–6, 9, 11–13]. Our AGC-NOS rate was 0.6% and was the highest rate in the literature. This situation could also be because of the concern of some of our pathologists' false-negative reports, as with the ASC-US diagnostic.

LSIL rates vary between 0.08% (Hakverdi et al.) and 4.60% (Bukhari et al.) in the literature [2–6, 9, 11–13]. Our LSIL rate was 0.32%and this was consistent with the literature. ASC-H rates vary between 0.00% (Bukhari et al.) and 1.63% (Bojgua et al.) in the literature [2–6, 9, 11–13]. Our ASC-H rate was 0.22% and was consistent with the literature.

HSIL varies between 0.06% (Özer et al.) and 2.20% (Bukhari et al.) in the literature [2–6, 9, 11–13]. Our HSIL rate was 0.1% and was consistent with the literature.

Infection rates are quite variable in the cervicovaginal smear case studies in the literature. Infection rates vary between 1.9% (Erdem et al.) and 31.54% (Patel et al.) [2, 6, 7, 14, 15]. Our infection rate was 16.91%, and this was the second highest rate in the literature. The most important factor for this high rate was the rate of bacterial vaginosis (13.76%). In the literature, bacterial vaginosis rates vary in a wide range from 0.7% (Erdem et al.) to 23.16% (Patel et al.), whereas this rate was 29.2% in 21 million women in America [17]. This high rate of bacterial vaginosis prevalence is probably related to the socio-economic and cultural variety in our region. In the literature, bacterial vaginosis is the most prevalent infection among cervicovaginal infections [18]. The highest prevalence of Candidiasis in the literature was reported in Perez et al.'s study in Colombia (9.1%). Candidiasis rates varied between 1% (Erdem et al.) and 9.1% [2, 6, 7, 14, 15]. Our Candidiasis rate was 2.15% and was lower compared to the foreign literature, but was consistent with the Turkish literature.

In the literature, Trichomonas vaginalis prevalence varies between 0.09% (Perez et al.) and 1.97% (Suochana et al. in India) [2, 6, 7, 14, 15]. Our Trichomonas vaginalis prevalence was 0.03% and was the lowest rate in the literature.

Actinomycosis prevalence varies between 0% (Patel et al.) and 0.6% (Daloğlu et al.) in the literature [2, 6, 7, 14, 15]. Our Actinomycosis prevalence was the highest rate in the literature, which was 0.87%. The high rate of Actinomycosis prevalence may also be related to the widespread use of intrauterine devices for contraceptive purposes, which is dependent on the varied socio-economic and cultural levels. On the other hand, nearly half of the cases had inflammation. There is limited data on this issue in the literature, which remained under-researched.

In this study, 11.9% of the cases presented atrophy findings and 94.12% of these atrophic smear cases were diagnosed as atrophic vaginitis. There is limited data in the literature on this issue, as well [19, 20]. The high rate of atrophic vaginitis cases was challenging.

ASC/SIL rates vary between 0.15% (Bukhari et al.) and 13.88% (Bojgua et al.) in the literature [2–6, 9, 11, 12]. Our ASC/SIL rate was 9.125, and this was the third highest ASC/SIL ratein the literature. ASC/SIL rates were 13.88% in Bojgua et al.'s study and 10.16% in Hakverdi et al.'s study. In the literature, there is an internationally accepted argument that states that the ASC/SIL rate should be under three within the framework of pathology laboratory quality standards [5, 14–16]. The reason for our 2018 ASC/SIL rate of 9.125 may be due to the concern of some of our pathologists' false-negative reports. Hence, the ASC (ASC-US or ASC-H) diagnostic result may be being used with the least doubt. Our findings suggest that the ASC diagnostic results are used in the cases that cannot completely meet the SIL diagnostic criteria, although they resemble them. Intradepartmental case presentations, participation in related in-service training programs and branching could help reduce the ASC/SIL rate below three. Calculating and reporting the ASC/SIL rates of each pathologist in quarterly periods within the framework of quality standards may help to decrease our ASC/SIL rate.

Conclusion

We detected several differences between epithelial abnormality and infection prevalence in the cervicovaginal smears in our region and epithelial abnormality and infection prevalence in different regions of the world. We assume that these differences will especially help Turkish clinicians in approaches to the patient for diagnostics and treatment.

Intradepartmental case presentations, participation in related in-service training programs and branching could be beneficial to keep ASC/SIL rates below three within the framework of quality standards in the laboratories where ASC/SIL rates are over three reported with the Bethesda reporting system. In addition, calculating and reporting the ASC/SIL rates of each pathologist in quarterly periods could contribute to improving this situation.

The high prevalence of atrophic vaginitis may be related to reduced attention to hygiene, hormonal exposure and decrease in immunity against infectious agents with increasing age. Further research is necessary to explain this high prevalence rate.

Ethics Committee Approval: The Ethics Committee of Bursa Yüksek İhtisas Training and Research Hospital Clinical Research provided the ethics committee approval for this study (2011-KAEK-25 2019/03-05 - 13.03.2019).

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Conflict of Interest: None declared.

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References

1. World Cancer Research Fund. Cervical cancer statistics. Available at: https://www.wcrf.org/dietandcancer/cancer-trends/cervical-cancer-statistics.
2. Erdem H, Şahiner C, Yıldırım U, Köse SA, Karataş A, Uzunlar AK, et al. Comparison of Cervicovaginal Pap Smear Results with Clinical Parameters. J Kartal TR 2011;22:121–6. [CrossRef]
3. Bukhari MH, Saba K, Qamar S, Majeed MM, Niazi S, Naeem S. Clinicopathological importance of Papanicolaou smears for the diagnosis of premalignant and malignant lesions of the cervix. J Cytol 2012;29:20–5. [CrossRef]
4. Arslan E, Gokdagli F, Bozdag H, Vatansever D, Karsy M. Abnormal Pap-smear frequency and comparison of repeat cytological follow-up with colposcopy during patient management; the importance of pathologist's guidance in the management. North Clin Istanb 2018;6:69–74. [CrossRef]
5. Turkish Cervical Cancer And Cervical Cytology Research Group. Prevalence of cervical cytological abnormalities in Turkey. Int J Gynaecol Obstet 2009;106:206–9. [CrossRef]
6. Patel CB, Shah PC, Bhagat VM. A role of cervical Pap smear as a screening tool in diagnosis of lesions of cervix—a one-year study. Int J Med Sci Public Health 2016;5:1841–55. [CrossRef]
7. Uribe-Pérez CJ, Díaz-Martínez LA, Ortiz-Serrano R, Meza-Durán EE. Pap Smear Prevalence and that of Pre-Malıgnant and Malignant Cervical Lesions Amongst Women Living in The Carmen Initiative Demonstration Area, Bucaramanga, Colombıa*. Revista Colombiana de Obstetricia y Ginecologia 2006;57:10–8.
8. Bassal R, Schejter E, Bachar R, Shapira H, Sandbank J, Supino Rosin L, et al. Cervical Pap screening among Israeli women, 2005–2010. Arch Gynecol Obstet 2014;289:615–22. [CrossRef]
9. Özer H, Tuncer E, Çiftç A, Keser H, Aker H, Elagöz Ş, et al. Epitel hücre anormalliği saptanan servikal smear olgularında sitolojik tanı dağılımı ve sito-histopatolojik korelasyon. Cumhuriyet Medical Journal 2012;34:319–24. [CrossRef]
10. Quddus MR, Sung CJ, Eklund CM, Reilly ME, Steinhoff MM. ASC: SIL ratio following implementation of the 2001 Bethesda System. Diagn Cytopathol 2004;30:240–2. [CrossRef]
11. Hakverdi S, HAKVERDİ S, Akansu B, Altıntaş S, Yaldız M, YALDIZ M, et al. Servikovaginal Smearlerde Sitolojik Bulguların Bethesda Sistemine Göre Değerlendirilmesi "Son Beş Yıldaki (2005-2010) Sonuçlarımız". Mustafa Kemal Üniversitesi Tıp Dergisi 2015;1:23–6.
12. Bojgua S, Kldiashvili E. Liquid Based Cytology Cervical Cancer Screening Program–Georgian Experience. Arch Can Res 2016;4:3. [CrossRef]
13. Nayir T, Okyay RA, Nazlican E, Yesilyurt H, Akbaba M, Ilhan B, et al. Cervical cancer screening in an early diagnosis and screening center in Mersin, Turkey. Asian Pac J Cancer Prev 2015;16:6909–12. [CrossRef]
14. Sulochana S., Muthuvel E., Harikrishnan V., Srinivasan C. Determination of Prevalence and Clinical Significance of Detection of Micro-organisms in Pap Smear with Seasonal Variation. NJLM 2017;6:PO13–PO16.
15. Daloglu FT, Karakaya YA, Balta H, Altun E, Duman A. Cervical cytological screening results of 8,495 cases in Turkey–common inflammation but infrequent epithelial cell abnormalities. Asian Pac J Cancer Prev 2014;15:5127–31. [CrossRef]
16. Nascimento AF1, Cibas ES. The ASC/SIL ratio for cytopathologists as a quality control measure: a follow-up study. Am J Clin Pathol 2007;128:653–6. [CrossRef]
17. Koumans EH, Sternberg M, Bruce C, McQuillan G, Kendrick J, Sutton M, et al. The prevalence of bacterial vaginosis in the United States, 2001–2004; associations with symptoms, sexual behaviors, and reproductive health. Sex Transm Dis 2007;34:864–9. [CrossRef]
18. Ahmed OI, Nourein IO, Elbadri MA, Abdelgadir AE, Ayed IAM, Shalayel MHF. The most Common Causes of Cervico-vaginal Infections Among Sudanese Women Complainingof Vaginal Discharge. International Journal of Clinical & Medical Microbiology. Int J Clin Med Microbiol 2016;1:104. [CrossRef]
19. Tabrizi AD.Atrophic Pap Smears, Differential Diagnosis and Pitfalls: A Review. International Journal of Women's Health and Reproduction Sciences 2018;6:2–5. [CrossRef]
20. Paladine HL, Desai UA. Vaginitis: Diagnosis and Treatment. Am Fam Physician 2018; 97:321–9.