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CLINICAL ARTICLE

Prevalence of cervical cytological abnormalities in Turkey

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A B S T R A C T

Objective: To evaluate retrospectively the prevalence of cervical cytological abnormalities in patient records obtained from healthcare centers in Turkey. Method: Demographic characteristics and data on cervical cytological abnormalities were evaluated from patients who underwent Pap tests in healthcare centers in 2007. Results: Data were collected from 33 healthcare centers totaling 140 334 patients. Overall, the prevalence of cervical cytological abnormalities was 1.8%; the prevalence of ASCUS, ASC-H, LSIL, HSIL, and AGC was 1.07%, 0.07%, 0.3%, 0.17%, and 0.08%, respectively. The prevalence of preinvasive cervical neoplasia was 1.7% and the prevalence of cytologically diagnosed invasive neoplasia was 0.06%. Conclusion: The abnormal cervical cytological prevalence rate in Turkey is lower than in Europe and North America. This might be due to sociocultural differences, lack of population-based screening programs, or a lower HPV prevalence rate in Turkey.

1. Introduction

It is well known that population-based cervical cancer screening using the Pap test significantly reduces the incidence of cervical carcinoma and the associated rate of mortality in high-income countries. Cervical carcinoma remains an important health problem in low-income countries because of the lack of such programs. There are 493 000 new cases of cervical carcinoma diagnosed annually worldwide and 274 000 deaths from cervical cancer each year. Almost 85% of these cases occur in low-income countries, accounting for 15% of all cancers in women [1–3].

Cervical cancer is the ninth most common cancer among women in Turkey and ranks 13th among cancer-related deaths. According to the GLOBOCAN database [3] more than 50% of the 1364 patients diagnosed with cervical carcinoma each year in Turkey die from the disease. However, reliable data on the prevalence of cervical cytological abnormalities in Turkey are not available. Although there are no organized mass screening programs, opportunistic screening is fairly widespread in Turkey; according to statistics supplied by the Ministry of Health, each year nearly 1 million Pap tests are performed in cancer screening and prevention centers funded by the Turkish government [4,5]. The aim of the present study was to evaluate the prevalence of cervical cytological abnormalities in women undergoing Pap screening in healthcare centers in Turkey.

2. Materials and methods

In April 2008, 44 healthcare centers in Turkey were contacted to determine whether they were eligible to participate in the study. Centers that agreed to participate were sent a database form to record the demographic characteristics and cervical cytological abnormalities in their patients. Participating healthcare centers collected data from Pap tests performed between January 1 2007 and December 31 2007. Infectious and benign epithelial changes were excluded from the analyses.

The medical records of all patients with a diagnosis of atypical squamous cells with undetermined significance (ASC-US), atypical glandular cells (AGC), low-grade squamous intraepithelial lesion (LSIL), high-grade squamous intraepithelial lesion (HSIL), squamous cell carcinoma (SCC), or adenocarcinoma (AdenoCa) were reviewed for previous medical history, diagnostic studies, and previous gynecologic disease.

All cytological smears had been collected with an Ayre spatula and/or an endobrush, and slides were evaluated at the pathology/cytopathology unit of each participating center. Routinely, Pap tests were screened by cytotechnicians (if available) and then further evaluated and recorded by the pathologists/cytopathologists at each center. Patients with a history of cervical, vaginal, or vulvar carcinoma were not included in the study, and in particular patients with a history of chemoradiotherapy for cervical carcinoma were excluded from the analyses.

Data were collected from patient files, pathology/cytology reports, and hospital records from each participating center. These data were sent to the principal investigators, and final analysis of the data was performed by these investigators (A. Ayhan and P. Dursun from Baskent University School of Medicine). Data relevant to potential

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Table 1
Demographic and clinical characteristics of patients (n = 140 334).[a]

Characteristics	Value
Age, y	
ASC-US	46 ± 12.3 (21–83)
ASC-H	51 ± 10.6 (26–73)
LSIL	33 ± 12.9 (18–79)
HSIL	46 ± 15.3 (30–86)
SCC	52 ± 10.8 (38–78)
AdenoCa	48 ± 14.9 (35–85)
Gravidity	
ASC-US	3.2 ± 1.5
ASC-H	3.3 ± 1.1
LSIL	1.7 ± 1.2
HSIL	2.1 ± 0.7
SCC	3.5 ± 2.2
AdenoCa	3.0 ± 0.8
Parity	
ASC-US	2.8 ± 1.4
ASC-H	2.8 ± 0.9
LSIL	1.5 ± 1.3
HSIL	2.1 ± 0.7
SCC	2.9 ± 1.9
AdenoCa	3.0 ± 0.8
Educational status	
Primary school	70
Secondary school	4
High school	9
University	12
Other	5
Presenting symptoms	
Menstrual abnormality	23
Vaginal discharge	26
Asymptomatic	16
Other	35

Abbreviations: ASC-US, atypical squamous cells with undetermined significance; ASC-H, atypical squamous cells suspicious for HSIL; LSIL, low-grade squamous intraepithelial lesions; HSIL, high-grade squamous intraepithelial lesions; SCC, squamous cell carcinoma; AdenoCa, adenocarcinoma.

[a] Values are given as mean ± SD (range), mean ± SD, or percentage.

cervical cancer risk factors for the patients, including age, history of smoking (past and current), gravidity, parity, level of education, family income, and marital status, were collected from all centers.

Statistical analyses were performed with SPSS version 11.0 (SPSS, Chicago, IL, USA) using descriptive statistical methods. The χ^2 or Fisher exact test and contingency table analysis were used for categorical data. Continuous variables were tested for significance using the t test. $P < 0.05$ was considered significant.

3. Results

Forty (91%) of the 44 healthcare centers contacted agreed to participate in the study although only 33 (75%) centers returned the forms. The study included data from 22 (67%) university clinics and 11 (33%) government hospitals and private healthcare centers. Data

Table 2
Distribution of cervical cytological abnormalities among university and other clinics.[a]

Cervical cytology	University hospitals (n = 82 048)	Government centers/private hospitals (n = 58 286)	Total (n = 140 334)
ASC-US	994 (1.21)	516 (0.88)	1510 (1.07)
ASC-H	84 (0.1)	16 (0.03)	100 (0.07)
LSIL	279 (0.34)	150 (0.26)	429 (0.3)
HSIL	142 (0.17)	101 (0.17)	243 (0.17)
AGC	101 (0.12)	10 (0.02)	111 (0.08)
SCC	51 (0.06)	8 (0.01)	59 (0.04)
AdenoCa	26 (0.03)	3 (0.005)	29 (0.02)

Abbreviations: See Table 1.
[a] Values are given as number (percentage).

Table 3
Distribution of the cervical cytological abnormalities in university hospitals.[a]

University clinic	No.	ASC-US	ASC-H	LSIL	HSIL	AGC	SCC	AdenoCa
Hacettepe	10317	62	5	39	14	12	9	10
GATA	8342	32	4	21	9	1	4	0
Gazi	7312	51	2	12	8	9	0	0
Erciyes	6400	163	14	4	13	27	9	4
Başkent	5440	15	0	24	3	4	4	3
Sütçü Imam	5245	80	5	5	1	0	0	0
Uludag	4649	71	3	15	6	3	1	1
Osmangazi	3906	17	0	4	4	4	1	0
Mersin	3860	90	5	39	12	2	1	1
Çukurova	3833	5	0	7	12	0	0	0
Karadeniz Technical	3651	14	4	17	7	8	9	4
İnönü	2571	28	2	13	5	7	6	0
Marmara	2300	18	2	13	12	0	1	3
Selçuk	2120	78	0	24	19	9	0	0
Fırat	2050	51	0	7	2	0	0	0
Mustafa Kemal	2048	21	2	0	1	0	1	0
Pamukkale	1898	19	0	2	3	0	0	0
Cumhuriyet	1809	68	9	12	2	9	3	0
Yuzuncu Yıl	1151	32	22	0	4	3	2	0
Gaziosmanpasa	1096	13	0	0	0	0	0	0
Alanya-Başkent	1000	38	0	11	0	0	0	0
Kars Kafkas	550	9	0	4	1	1	0	0
Yeditepe	500	19	5	6	4	2	0	0
Total	82 048	994	84	279	142	101	51	26

Abbreviations: See Table 1.
[a] Values are given as number of patients.

records were collected for 140 334 women. All of the healthcare centers used the Bethesda classification system. Participating centers used conventional Pap tests, except Hacettepe University and Kayseri University, which used liquid-based cervical cytological testing.

Demographic characteristics and cervical cytological abnormalities of the patients included in the study are given in Table 1. Patients had presented with menstrual abnormalities (23%), vaginal discharge (26%), and other symptoms (35%), and 16% of the patients were asymptomatic.

Overall, the prevalence of cytological abnormality was 1.8%, and the prevalence of ASC-US, ASC-H, LSIL, HSIL, and AGC was 1.07%, 0.07%, 0.3%, 0.17%, and 0.08%, respectively. The prevalence of preinvasive cervical neoplasia was 1.7%, and the prevalence of invasive neoplasia was 0.06%. Among the cervical cytology specimens, 0.04% were classified as SCC and 0.02% as adenocarcinoma. The prevalence of SCC at university hospitals was higher than at the other centers (0.06% vs 0.01%) (Table 2). In addition, the prevalence of cytological abnormalities was lower at government/private centers than at university hospitals ($P < 0.0001$). Tables 3 and 4 show the prevalence of cervical cytological abnormalities by category of healthcare center.

Table 4
Distribution of the cervical cytological abnormalities in government centers and private hospitals.[a]

Hospital	No.	ASC-US	ASC-H	LSIL	HSIL	AGC	SCC	AdenoCa
Etlik SSK	25 359	193	12	62	74	10	2	1
Ankara Numune	7000	165	0	16	11	0	0	0
Göztepe Research	6700	7	0	9	1	0	0	0
Zübeyde Hanım Maternity	6380	25	0	12	4	0	0	0
Demetevler Onkoloji	4719	3	0	5	4	0	4	1
Adana SSK	3328	0	0	2	0	0	1	0
Kutahya Goverment	1600	25	1	2	0	0	0	1
Avrasya	1340	44	1	13	1	0	0	0
Çankırı Goverment	987	0	0	2	4	0	0	0
Çamlık	452	24	1	19	1	0	0	0
Bucak Government	421	30	1	8	1	0	1	0
Total	58 286	516	16	150	101	10	8	3

Abbreviations: See Table 1.
[a] Values are given as number of patients.