CLINICOPATHOLOGIC CORRELATION OF THE UNSATISFACTORY PAPANICOLAOU SMEAR

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Abstract- The 1991 Bethesda System for cervical/vaginal cytology reporting has defined adequacy criteria, including unsatisfactory designation. Most laboratories in USA and a few laboratories in Iran have implemented these criteria, but only few studies about clinical implications have been performed. All unsatisfactory Papanicolaou (Pap) smears taken between August 2000 and March 2002 were retrieved from the file of cytologic reports of Mirza Koochak Khan Hospital's Department of Pathology. Of 4,598 total Pap smears 204 (4.4%) were unsatisfactory (corresponding atypical rate of 2.5% and a SIL/carcinoma rate of 0.97%). About 20.2% of unsatisfactory Pap smears were from patients with a history of epithelial abnormalities. The majority (71 of 204 specimens; 35%) of follow-up Pap smears or biopsies occurred within 6 months,12% within 6-12 months,1% within 12-18 months and 1% after 18 months. Approximately 59% had no follow-up. The first repeat Pap smear or histologic specimen in 83 patients with follow-up was negative in 71 (85%), unsatisfactory in 2 (2.4%), epithelial cell abnormality in 11 (13.2%) and atypical squamous cells of undetermined significance in 4(4.8%). Nonmalignant conditions contributing to the unsatisfactory smears on histologic specimens (23%) included cervicitis, endocervical polyp and endometritis. Majority of patients with unsatisfactory Pap smears were followed up within 6 months. A significant number (13.2%) of those with follow-up had eventual diagnosis of epithelial cell abnormality. Benign pathologic conditions also contributed to unsatisfactory smears. These patients were more likely to have a history of abnormalities. Unsatisfactory specimens are associated with benign as well as preneoplastic/neoplastic conditions. Clinical correlation should be the first step in delineating the cause of the unsatisfactory diagnosis.

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INTRODUCTION

Fifty years ago, cancer of uterine cervix was the leading cause of cancer death in women, but now it is the 8th leading cause of cancer death in women. Most of this reduction is due to detection of premalignant/ malignant conditions at earlier stages by Papanicolaou (Pap) smear (1,2). The Bethesda System introduced diagnostic terminology to facilitate more uniform means of communication in the reporting of Pap smears. Specimen adequacy was an important contribution of the Bethesda System which included the categories of satisfactory, satisfactory but less than optimal, and unsatisfactory (3-5).

Retrospective studies have supported the importance of the judgment about specimen adequacy and the unsatisfactory category in particular (6). The goal of this study was to determine the clinical follow-up and outcome of the unsatisfactory Pap smears, thereby improving patient management decisions in the future.

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MATERIALS AND METHODS

From the files of cytologic reports of Mirza Koochak Khan Hospital's department of pathology, we retrieved all reports of unsatisfactory smears and their slides which were taken between August 2000 and March 2002.

The criteria for the unsatisfactory diagnosis was that of the Bethesda System and included scant cellularity (<10% of slide covered by interpretable squamous cells), >75% of the epithelial cells obscured by blood and/or inflammation, air-dry artifact, excessive cytolysis or thick smear (3-5). Broken slides and those without patient identification were not included in this study.

Of a total of 4598 Pap smears obtained during this 18-month period, 208 had been reported as unsatisfactory.

After reviewing all of the related slides, 4 of them were excluded from the category because of misinterpretation about specimen adequacy. Finally it was concluded that 204 (4.4%) of total 4598 smears were unsatisfactory. Table 1 shows reasons for the diagnosis of unsatisfactory smears and their frequencies.

The corresponding atypical squamous cells of undetermined significance (ASCUS) rate was 2.5%, and the squamous intraepithelial lesion (SIL)/carcinoma rate was 0.97%.

Previous specimens of patients were also checked to determine whether there was a history of cervicovaginal epithelial abnormalities during the past three years.

Table 1. Reasons and their frequencies for diagnosis of unsatisfactory specimens

Reason of being Unsatisfactory	No.	Percent
Total	204	100
Scant cellularity	165	81.1
Obscuring inflammation	28	13.7
Obscuring blood	8	3.9
Obscuring blood & inflammation	2	0.9
Excessive cytolysis	1	0.4

RESULTS

An unsatisfactory diagnosis was made in 204 (4.4%) of 4598 specimens, with scant cellularity and obscuring inflammation or blood being the most common reasons for this diagnosis. Table 1 shows reasons for the diagnosis of unsatisfactory smears and their frequencies. Patients ranged in age from 19 to 91 years, with a mean of 41 years (age of two patients had not been mentioned in request form and therefore not included in this calculation).

Unsatisfactory specimens were significantly more likely to come from patients with a history of a cervicovaginal epithelial abnormality (20.2%), either ASCUS or SIL/carcinoma. A little more than one third of unsatisfactory specimens (83 of 204 specimens; 41%) had follow-up Pap smears or gynecologic biopsies performed. Approximately 86% of the follow-up studies occurred within 6 months, 12% within 6-12 months, 1% within 12-18 months, and 1% after 18 months. Approximately 59% of all cases had no follow-up.

The first repeat Pap smear or histologic specimen was negative in 71 (85%), unsatisfactory in 2(2.4%), ASCUS in 4 (4.8%), atypical glandular cells of undetermined significance (AGUS) in 2 (2.4%), benign endometrial cells in postmenopausal women (which categorizes as epithelial cell abnormality/glandular cell according to the Bethesda system) in 2 (2.4%), epithelial cell abnormality endocervical/metaplastic type in 1 (1.2%), and SIL in 1(1.2%). This rate of initial abnormalities was significantly higher than the incidence of cervicovaginal epithelial abnormalities in patients with satisfactory specimens (13.2% for unsatisfactory specimens versus 4.8% for the satisfactory and satisfactory but less than optimal groups).

After reviewing the previous specimens of patients during the last three years, this rate was raised from 13.2% to 20.2% for the unsatisfactory specimens. Of 17 patients which had unsatisfactory specimens and epithelial cell abnormality in their follow-up or previous specimens, their first specimesn (unsatisfactory specimen) were characterized as scant squamous cellularity (13 patients), obscuring blood (3 patients) and obscuring inflammation (1 patient).

DISCUSSION

The unsatisfactory Pap smear by definition indicates unreliability for the detection of cervical epithelial abnormalities (1,2). This definition has an important application in patient management. Considering unsatisfactory Pap smears as negative is incorrect since negative means absence of disease (SIL or malignancy) and may not prompt adequate follow-up measures. The strong association between false-negatives and unsatisfactory specimens has been amply documented in retrospective studies (6).

The unsatisfactory Pap smear now has a definition, but what is the clinical significance of such smears? The purpose of this study was to delineate the clinical follow-up of the unsatisfactory Pap smears in a university medical center (Mirza Koochak Khan Hospital), and comparing it's results with two other similar studies which were performed by Ransdell *et al.*(6) and Mc Garaghan *et al.* (7), thereby enhancing patients' outcome and management decisions in the future (Table 2).

The most common reason for an unsatisfactory specimen in this study was scant cellularity, with obscuring inflammation and/or blood next in frequency, which is similar with the other two studies. The unsatisfactory rate was 4.4% in this study, which is more than the rate in Ransdell (0.3%) and Mc Garaghan (0.4%) studies (6, 7). The unsatisfactory rate, according to reference books, must be less than 1% (4). As mentioned above the most common reason for unsatisfactory specimen in this study was scant cellularity, which is related to the technique of sampling, and therefore taking the samples by well trained persons will reduce the overall rate of unsatisfactory specimens.

Less than half of the patients (41%) had follow-up exam (86% within 6 months), but in Ransdell's study 69% of patients had follow-up exam (62% within 6 months) and in Mc Garaghan's study none of the patients had follow-up exam (6,7).

The number of specimens with epithelial cell abnormality on follow-up was higher than the overall prevalence of abnormalities in other groups (rate of SIL/carcinoma in unsatisfactory smears was 9.6%, but in satisfactory and satisfactory but less than optimal categories this rate was 0.97%). The importance of regarding these patients as being at high risk is emphasized by this observation. Unfortunately 59% of patients had no follow-up exam in this study, but in Ransdell's study this rate was 31% and in Mc Garaghan's study it was 100%. The rate of epithelial cell abnormality in previous or follow-up exam of unsatisfactory smears was 20.2% and rate of SIL/carcinoma was 9.6%, but as mentioned before, it was 0.97% for the other patients. In Ransdell's study the rate of SIL/carcinoma in previous or follow-up exams of unsatisfactory smears was 26% and in Mc Garaghan's study it was 20% in previous smears (because none of the patients had follow-up).

As it is apparent, the rate of SIL/carcinoma in this study is much lower than the other two studies, which can be explained by this fact that the referring patients to this hospital are from low risk population. This fact is also evident from the ASCUS rate, which is 2.5% in this study (the rate of ASCUS in low risk population is lower than 5%).

Table 2. Comparison of the results of present study with two previous studies

Parameter	Ransdell	Mc Garaghan	Current study
Rate of unsatisfactory specimens	0.3%	0.4%	4.4%
Reason of unsatisfactory (in decreasing order)	1.Scant cellularity 2.Obscuring inflammation 3.Obscuring blood	1.Scant cellularity 2.Obscuring inflammation 3.Obscuring blood	1.Scant cellularity 2.Obscuring inflammation 3.Obscuring blood
Rate of follow-up	69%(62% in 6 months)	0%	41%(86% in 6 months)
Rate of epithelial cell abnormality (in previous and follow-up smears)	26%	20% (only previous smears)	20.2%

In conclusion, unsatisfactory Pap smears are important in patient management. Routine specimen adequacy evaluation plays an important role in minimizing false negative reports. High percentages of such patients have an abnormal history and should be evaluated carefully. Unsatisfactory specimens are associated with benign as well as preneoplastic/neoplastic conditions. Therefore, clinical correlation and patient examination should be the first step in delineating the cause of the unsatisfactory diagnosis.

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