DIAGNOSTIC EFFICIENCY OF LIQUID CYTOLOGY IN EXAMINATION OF WOMEN WITH CERVICAL PATHOLOGY

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Abstract: One of the urgent tasks of modern healthcare is timely diagnostics of precancerous diseases and cervical cancer. Cervical cancer ranks third in the world among the most common malignant neoplasms in women and is the cause of premature death of hundreds of thousands of women. Every year, 530 thousand new cases of cervical cancer are diagnosed in the world and more than 270 thousand women die from this disease. More than 85% of deaths occur in low- and middle-income countries. In developing countries, mortality from cervical cancer is much higher due to the lack of screening programs and limited access to health care [1]. In our country, malignant neoplasms of the reproductive system predominate in the structure of oncological morbidity in women (38.8%). Cervical cancer in the structure of mortality from malignant neoplasms in our country is the cause of death of 24% of women aged 30 to 39 years and 13.7% of women aged 40 to 49 years [2].

Cervical cytology has been the basis of cervical cancer (CC) screening and prevention since the mid-20th century. Traditional cytology (TC) is an effective and inexpensive method of CC screening that does not require expensive equipment to prepare preparations. Unfortunately, TC depends on the information content and quality of the material obtained by the gynecologist. Inadequate collection of material for cytological examination or its application to glass is the cause of 2/3 of false negative results (abnormal epithelium does not get on the instrument, and therefore, into the preparation). Liquid-based cytology (LBC) was introduced into practice in the mid-1990s. Preparations for LBC are prepared as follows: the sampling instrument is washed in a liquid medium to obtain a cell suspension and the entire vial is sent to the cytology department for preparation of preparations using automated equipment.

The reason for missed CIN and cervical cancer may be an error in interpreting the cytological picture (abnormal cells are present in the preparation, but missed by the cytologist). Interpretation errors account for 1/3 of all undetected cases of cervical pathology [4]. According to the literature, when comparing the sensitivity of the LBC using the SurePath technology and conventional smears with histologically proven pathology of the cervical epithelium, a tendency towards an increase in the sensitivity of SurePath was observed - 79.1 versus 73.7% (913 women), the frequency of detection of squamous cell abnormalities was significantly higher using the LBC method - 11.5% versus 7.7%, the indicators of total abnormal glandular epithelium were similar - 0.4% versus 0.6%. ASC-US and LSIL (atypical squamous cells of undetermined significance, low grade squamous intraepithelial lesion) were detected more often by the LBC method - 9.5% versus 6.1% (23,000 women). In addition, according to the same authors, computer image analysis, compared with traditional viewing of preparations, also increases the likelihood of detecting CIN [7, 8].

According to our data, the amount of uninformative material is almost the same in the TC and in the LBC, i.e. if the material is uninformative in the TC, it will also be uninformative in the LBC.

It is noteworthy that the percentage of uninformative material is high both in the TC and in the LBC, despite the fact that the material was collected by a qualified gynecologist. We compared different instruments for collecting material. A greater amount of uninformative material was observed when using the F-type cytobrush, a smaller amount was observed when using the Cervex-Brush Combi, which in some cases simply do not reach the transformation zone (in 30% of patients, this zone is located deeper than 8-10 mm from the external os in the cervical canal). In addition, the probe part of the Cervex-Brush Combi cytobrush is quite rigid, which does not allow the tip of the probe to reach the side walls in the wider part of the cervical canal. The softer and more pliable probe part of the F-type cytobrush better collects material from the side walls, but due to its shorter length, it often does not reach the transformation zone.

The best results were obtained using a D-type cytobrush and a wooden spatula. In addition, an individual approach to each patient is necessary. When choosing an instrument for collecting material for cytological examination, it is necessary to take into account the anatomical features of the cervix, the type of transformation zone, the condition and size of the external os, the size of the working part of the instrument for collecting smears, which is not observed, therefore such a large percentage of uninformative material is present during cervical cancer screening. It is necessary to correctly apply the smear to the glass and comply with the storage rules and terms of transportation of the material to the cytological laboratory.

The aim of the work is to compare the effectiveness of traditional and liquid cytology in women during screening of cervical pathology.

Materials and methods. The study included 97 women aged 21 to 35 years who applied to the outpatient clinic of the city of Urgench for a routine examination and cytological screening of cervical pathology. All women underwent cytological examination by one of two methods: conventional cytology (n=42) and liquid cytology (n=55). The sensitivity, specificity, and accuracy of the LBC method were 78.3%, 95.9%, and 85%, while those of the TC method were 80%, 96.2%, and 89.2%, respectively. Thus, according to M. V. Savostikova et al., the LBC showed worse results than the TC. Unfortunately, the authors did not analyze the reasons for the results obtained [1]. The LBC allows for molecular tests, in particular, the HPV test; Abnormal cytology material remaining in the specimen is used for molecular or immunocytochemical testing without the need for repeat sampling. LBC sampling can also be used when HPV is used as the primary screening test, allowing HPV-positive women to have their specimens tested cytologically without the need to repeat the sampling or take two specimens, one for HPV testing and one for routine cytology. However, the costs are high because only 5–7% of women screened with this approach have abnormal cytology, and the proportion of women who are HPV-infected is over 70% [9].

Results. The results of cytological screening by the conventional method showed the norm in 22 women (52.3%), atypical cells of stratified squamous epithelium of unclear significance - in 4 (9.6%), mild dysplasia - in 15 (35.7%), severe dysplasia - in 1 (2.4%),

The results of cytological screening by the liquid cytology method showed the norm in 3 women (5.4%), atypical cells of stratified squamous epithelium of unclear significance - in 7 (12.7%), mild

dysplasia - in 44 (80%), severe dysplasia - in 1 (1.8%). To confirm the diagnosis, a histological examination of biopsies from the cervix was performed in the examined women of both groups. When comparing the results of histological and cytological methods of research, histological confirmation was found in 97% of cases with liquid and 88% with conventional cytology.

Currently, gynecologic practice faces problems associated with the equivocal interpretation of ASC-US. In our study, ASC-US was not diagnosed. According to the College of American Pathologists, with the use of the LBC method (ThinPrep and SurePath), the incidence of ASC-US increases and ranges from 0.9% to 11% [6]. Since its introduction in 1988, ASC-US has been a problematic and controversial diagnosis. The ASC-US conclusion can be caused by the quality of the smear and its interpretation. HPV testing, colposcopy and biopsy are recommended for the management of patients with ASC-US cytology. It has been shown that with ASC-US cytology, HSIL was detected in 40% to 60% of cases by histological examination [8]. Therefore, the Bethesda classification introduced the category ASC-H (atypical squamous cells, not excluding severe squamous intraepithelial lesion).

The sensitivity of TC smears from the cervix was 96.2%, and that of LBC was 92.4%. There were no false positive cases in our study either in TC or LBC. The accuracy of TC was 92%, and that of LCC was 89.6%. Slightly worse indicators in LBC are associated with insufficient experience in viewing liquid preparations.

Conclusion. Thus, the authors of the study came to the conclusion that the liquid cytology method is the most reliable laboratory test, which reduces the number of inadequate smears and false negative results, and also reduces the time required to conduct a cytological study.

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