Study on Screening Cervical Precancerous Lesions by High-risk Human Papillomavirus DNA Detection and Cytological Examination

Lingling Tong, Xiaojun Liu*

China-Japan Union Hospital of Jilin University, Changchun, Jilin, 130033, China

*corresponding author: Xiaojun Liu

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Abstract: Cervical cancer is one of the common malignant tumors in gynecology in China. In recent years, its incidence has increased significantly, and it has a younger trend, which seriously threatens women's physical and mental health. Clinical studies have fully confirmed that early detection and early treatment are of great value in achieving good prognosis and prolonging survival. The main link in the prevention and control of cervical cancer is the early diagnosis and treatment of precancerous lesions, blocking the potential risk of progression to cervical cancer. The key to preventing and controlling cervical cancer is early diagnosis and treatment of precancerous lesions, blocking the potential risk of progression to cervical cancer. Therefore, a reasonable and effective screening program can reduce the incidence of cervical cancer. In this study, high-risk human papillomavirus (HPV) DNA detection and cervical cytology were used. Screening for cervical precancerous lesions among women visiting gynecological clinics and taking effective measures to prevent HPV infection are undoubtedly very necessary for the prevention and treatment of cervical cancer. Screening methods for cervical cancer have also evolved from a single Histocytological level to a molecular level.

1. Introduction

Cervical cancer is one of the common malignant tumors in gynecology in China. In recent years, its incidence has increased significantly, and it has a younger trend, which seriously threatens women's physical and mental health [1]. Clinical studies have fully confirmed that early detection and early treatment are of great value in achieving good prognosis and prolonging survival. The clinical symptoms of cervical cancer patients are mainly vaginal contact bleeding, vaginal discharge, increased fluid discharge and even secondary infection. The amount of vaginal bleeding varies from person to person, depending on the extent of the patient's lesion and the extent of the condition [2]. Both developed and developing countries are exploring rational and cost-effective screening programmes to study new screening techniques. In recent years, liquid-based cytology and high-risk human papillomavirus DNA have been used to screen early cervical cancer at home and abroad, and good results have been achieved [3]. Cervical cancer is one of the most easily detected and diagnosed tumors in gynecological tumors. However, there is still a considerable mortality rate at home and abroad [4]. How to improve the accuracy of early diagnosis is particularly important. The main link of prevention and control of cervical cancer is early diagnosis and treatment of precancerous lesions, blocking their potential risk of progression to cervical cancer.

The factors leading to cervical cancer are not yet clear. It is mainly related to such factors as early marriage, early childbearing, sexual disorder and the transformation of cholesterol from prepuce scale into carcinogens after bacterial action [5]. Since cervical cytology has been widely used in cervical cancer screening, the incidence and mortality of cervical cancer in developing and developed countries have decreased. But routine Pap smear has low sensitivity to diagnosis and high false negative rate, which can not meet the needs of screening [6]. How to diagnose and treat cervical cancer early in clinic has been a subject of great concern. With the continuous progress and development of medical technology, the diagnosis and detection methods of cervical cancer are constantly updated [7]. The key to preventing and controlling cervical cancer is early diagnosis and

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treatment of precancerous lesions, blocking the potential risk of progression to cervical cancer. Therefore, a reasonable and effective screening program can reduce the incidence of cervical cancer [8]. This study utilized high-risk HPV DNA testing in conjunction with cervical cytology. Screening for cervical precancerous lesions in women attending gynaecological outpatient clinics and evaluating the effectiveness of screening. The significance of high-risk HPV DNA hybrid capture (HC-2) detection in the clinical diagnosis of cervical cancer and precancerous lesions was discussed.

2. Materials and Methods

High-risk HPV DNA, hybrid capture method was used to detect combined cervical lysate liquid-based cytology (LPT) and multi-point biopsy under colposcopy. The application prospect of HPV genotyping for screening cervical cancer is broad. HPV has a high false negative rate in current clinical applications. As an important factor leading to the pathogenesis of cervical cancer, the results of HPV genotyping are critical to some extent. However, some of the false negative rate will interfere with the results, so it is gradually replaced by liquid-based cytology in the clinic [9]. High-risk HPV viruses can be detected throughout the process from infection to cancer. At the same time, it can determine the etiology of the patients who have undergone cell morphological changes. Liquid-based cytology can detect the cytological changes that have taken place and judge whether it has entered the clinical stage. The synergistic effect is remarkable. Specialized obstetricians and gynecologists perform the examination and localization biopsy of suspected lesions. If no obvious lesion or image is not satisfactory under the microscope, cervical multipoint biopsy or cervical canal scraping are performed. Under colposcopy, multiple biopsies were performed at the sites with severe lesions, and pathological sections were sent for examination. Curettage was added to atypical glandular cells to scrape the cervical canal. Table 1 shows the comparison of abnormal HC-2 on cervical cytological smears and positive results of multipoint biopsy under colposcopy.

Table 1 Comparison of positive results of multi-point biopsy

LPT results	Number of cases	Carcinoma in situ	CIN	HC-2
Normal	472	0	2	59
ASCUS	8	0	1	5
LSIL	5	1	1	3

Liquid-based cytology is the use of a liquid-based thin-layer cell detection system to detect cervical cells and perform cytological classification diagnosis. It is currently a widely used technique in clinical practice, and the detection rate of cervical cancer cells for cervical cancer cells is 100%. The exfoliated cells of the external cervical and cervical canal were taken with a cervical brush, and the collected cells were washed into a vial containing the ThinPrep cell preservation solution. The mucus, blood and inflammatory cells in the specimen are separated from the epithelial cells. After filtering through a precision filter, it was transferred to an electrostatically treated glass slide to prepare a thin layer of cell smears having a diameter of 1.5 cm. ASCUS, low-grade squamous epithelial lesion, high-grade squamous epithelial lesion and squamous cell carcinoma in normal range and with unknown significance. Except in the normal range, the others were all positive. Push the brush head into the bottle and wash the collected cells into the small bottle containing the preservation solution for liquid-based cytological detection. Colposcopy was performed for any abnormal examination method, and cervical biopsy was performed for suspicious lesions under colposcopy. At least 20 types of high-risk HPV are associated with 95% of early invasive and invasive cervical cancer. HPV infection, especially high-risk HPV infection, has a clear relationship with the occurrence of cervical cancer.

3. Result Analysis and Discussion

The combination of HPV DNA detection and liquid-based cytology is the best screening method.

The combination of the two can greatly improve the sensitivity and negative predictive value. Very high sensitivity is conducive to the detection of high-risk groups, reducing the rate of missed diagnosis. As a screening method for cervical cancer, the low specificity of high-risk HPV DNA detection may be due to the fact that some types of HPV are not included in the detection range of high-risk HPV DNA hybridization probes. High-risk HPV DNA probes and low-risk HPV or other types of HPV. In recent years, a new screening technology, TCT technology, has been developed. TCT technology has changed the smear operation method of Papanicolaou smear method. After sampling with the specimen brush, it is immediately placed in the cell preservation solution, so that the sampled cells are concentrated, stored and sent for examination, and the TBS system is used for cytological diagnosis. The positive rate has been greatly improved, so it is quickly used in clinical cervical cancer screening. The liquid-based cell thin-layer smear technique improves the method of taking and producing the sample, and the collected cell sample is placed in the cell preservation solution. After special treatment, the blood, mucus and inflammatory cells mixed in the specimen can be separated and removed. The illusion of abnormal cell morphology caused by excessive cell drying caused by ordinary smear is avoided.

Colposcopy observation mainly depends on the boundary morphology, color, vascular structure and iodine reaction of the lesion. First wipe the surface of the cervix and vaginal secretions with a dry cotton swab, observe the squamous junction and blood vessels, and then apply 3% acetic acid solution on the surface of the cervix. After the microscope, white epithelium, mosaic, point blood vessels and various abnormal blood vessels were observed. Next, the iodine solution test was not colored as an iodine test positive zone. Both traditional smears and thin-layer liquid-based cytology require professional cytologists to make a diagnosis after reading the cells. The subjectivity of cytological examination cannot be completely avoided. Compared with the single method, the result is that too many patients will undergo colposcopy [10]. Biopsy of suspicious lesions under colposcopy is the final means of definite diagnosis, which can reduce the occurrence of false negative and false positive. It can improve the early diagnosis rate of CIN2 and cervical cancer more significantly. Pap smear has been introduced into the clinic as a screening method for cervical cancer, which has significantly controlled the incidence of cervical cancer.

Due to factors such as film production, its accuracy is affected by many factors, and inevitably, false negatives will occur. The sensitivity and accuracy of TCT combined with HPV detection were significantly higher than those of TCT alone or high-risk HPV-DNA. The monoclonal antibody was used for the measurement, and the latter was determined by a one-way immunodiffusion method. The quality of life of patients is compared as shown in Table 2. The body condition of the observation group patients is as shown in Figure 1.

Table 2 Comparison of patients' quality of life

Group	Improve	STable	Reduce
Observation group	104	56	40
Control group	52	84	64

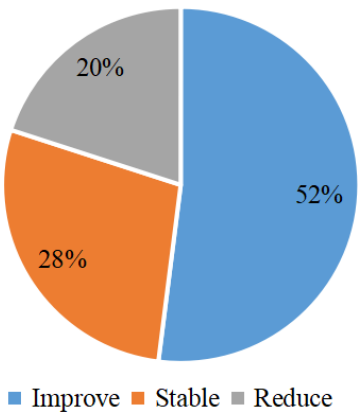

Fig.1. The proportion of patients in the observation group

Human papillomavirus (HPV) is closely related to cervical cancer, which is the second most common cancer in women. High-risk HPV has a higher chance of causing cancer. The significance of detecting HPV is that it can be used as a primary screening method to concentrate high-risk populations, and is an effective reclassification method for ASC-US and LSIL, which are not clearly diagnosed. It can also be used for the monitoring of cervical intraepithelial neoplasia and cervical cancer treatment. . The rate of missed diagnosis can be minimized, but the cost of screening increases. During the production process, the interference of blood, mucus and excessive inflammatory cells is removed, and excessive overlap of cells is avoided to facilitate reading and diagnosis. TCT thin slices can significantly improve smear satisfaction because of their clear cell structure and clear background. The sampling error of bus smear is effectively avoided and the false negative rate is reduced. The lesions of cervix and inferior genital tract epithelium and blood vessels were observed directly under electronic monitor. It is one of the important methods for early diagnosis of cervical cancer and precancerous lesions. Locating biopsy at suspicious lesions can improve the positive rate of biopsy and the accuracy of diagnosis. For high-risk HPV DNA test or cytological test results abnormal. Colposcopy and cervical biopsy are the most reliable screening methods for cervical cancer.

4. Conclusion

Accurate detection of HPV infection can increase the sensitivity of screening for cervical precancerous lesions and improve the prevention and treatment of cervical cancer in women. Early symptoms of cervical cancer are not obvious. Screening and early warning are very important for early detection of cervical cancer and reduction of mortality. The combination of high-risk HPV DNA detection and cervical liquid-based cytology greatly improves the sensitivity of screening, which is conducive to the detection of high-risk population. In order to reduce the rate of missed diagnosis, early diagnosis and treatment can be achieved as far as possible. To establish a simple, rapid, economical, sensitive and simultaneous screening method for detecting multiple subtypes of HPV for early detection of HPV infection. High-risk HPV DNA detection has the advantage of high sensitivity and negative predictive value. Combined cytology is an effective screening program for cervical precancerous lesions, and colposcopy can increase diagnostic accuracy. Taking effective measures to prevent HPV infection is undoubtedly necessary for the prevention and treatment of cervical cancer. Screening methods for cervical cancer have also progressed from a single tissue cytology level to a molecular level. TCT combined with HPV detection has become another anti-cancer screening method for the cervix, which can greatly improve the accuracy of cervical lesion diagnosis, and achieve early detection, early treatment plays an important role in the prevention and treatment of cervical cancer.

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