

Application of TCT to Research on Value in Screening for Cervical Cancer in Postmenopausal Women

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Abstract: *Objective:* To study the screening for cervical cancer in postmenopausal women in liquid-based cell test (TCT) application value. *Methods:* From January 2023 to March 2024 hospital check-ups and outpatient reached 400 cases of postmenopausal women, and they were TCT and HPV detection, during the study period to pathological diagnosis of numerical results as the standard, analysis of TCT detection application of screening for cervical cancer in postmenopausal women and the effect. *Results:* After the TCT detection, the inflammation group and normal group by use of HPV testing positive rate higher than other groups ($P < 0.05$). Hospital after pathological diagnosis and research, after the screening system found CIN I level and above cases about 39 cases, the TCT and HPV detection rate of positive difference is not obvious, and there is no statistical significance ($P > 0.05$). Joint test analysis, the sensitivity and specificity were higher than that of TCT and HPV testing positive ($P < 0.05$). *Conclusion:* TCT detection screening for cervical cancer in postmenopausal women is of great importance to the application, if you can join HPV testing, help to improve the detection sensitivity, avoid missed diagnosis of problems, and then for treatment and later restore to lay a solid foundation.

Keywords: TCT; Postmenopausal women; Cervical cancer screening; Pathological diagnosis; Treatment; Value research

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1. Introduction

In recent years, a class of cervical cancer become common in gynecological malignant tumors, and its prevalence also increases year by year, presenting the characteristics of the young, in the everyday lives of women with severe impact^[1]. Cervical cancer patients with early and no obvious characteristics, if only by the appearance of the cervix and unable to distinguish, which leads to the occurrence of misdiagnosis, directly affect the effect of treatment. However, if the disease continues to deteriorate, vaginal bleeding and vaginal drainage will appear as such problems as lower limb pain, patients with more severe anemia, and the body will appear to have degradation problems, directly affecting their life^[2]. Cervical cancer patients have found

a lot of time later, found that when the disease is severe, the fatality rate is high, which also attaches great importance to the medical community. Under the background of the aging society, screening for cervical cancer in postmenopausal women is very important, if the problem can be found in time, and treatment of the system, and helps to reduce the mortality of cervical cancer^[3-5]. However, with the development of medical science and technology level constantly, TCT detection technology level unceasing enhancement, it has also been applied to clinical medicine, but for various reasons, there is a controversy. Therefore, hospitals from January 2023 to March 2024 in hospital check-ups and outpatient meet accords with an index of postmenopausal women as the research object, explore the TCT detection used in the actual value of screening for cervical cancer in postmenopausal women and a detailed and in-depth research.

2. Data and methods

2.1. General information

400 postmenopausal women in hospitals and outpatient clinics from January 2023 to March 2024 were selected as the main research objects, and their age was between 45 and 78 years old, the average age was (57.3 ± 6.5) years old, the duration of menopause was between 3 and 19 years, the average age was (12.9 ± 4.2) years, and the number of pregnancies was between 0 and 7 times. The average number of pregnancies was (3.8 ± 0.5) times, and the number of births was 0–5 times, with an average of (2.1 ± 0.8) times.

Inclusion criteria: (1) The research object of consciousness, the normal and pathological diagnosis of personal information is complete, and can cooperate with research work; (2) To obtain the consent of the patients and families, mobile location takes a biopsy and pathological examination. Exclusion criteria: (1) Patients with a history of cervical treatment; (2) Patients with gynecological malignant tumors; (3) Patients with mental disorders, illiteracy and communication disorders; (4) Patients with coagulation disorders or infectious diseases^[6]. After the hospital's ethics committee approval, the object of study knowledge after signing the consent form, and the object of study data contrast difference is not significant ($P > 0.05$), with a comparative.

2.2. Methods

To TCT, HPV examination of 400 cases of postmenopausal women. The specific method is as follows: First of all, TCT examination will be applied to the detection of a special brush, which is also a special brush TCT. The brush was placed in the junction of the cervical canal and the squamous and columnar epithelium to extract the corresponding markers, and the exfoliated cells were collected by rotating clockwise. After collection, the brush head was placed in a special sampling bottle. In accordance with the requirements of the instrument operation, carries on the production, the choice of 95% alcohol is fixed, and do a good job in the subsequent dyeing inspection on standard analysis. According to the standard of TBS, the examination was carried out according to ordinary inflammation and atypical squamous cell lesions of unknown significance^[7-9].

After examination, it was found that TCT results were more than atypical squamous cells of undetermined significance, so it was judged as positive. Secondly, do a good job of basic screening. May contain a high-risk type HPV E6 / E7 mRNA samples put in cracking agent, and proper water bath treatment. Then 20°C (including L single HPV positive quality nucleic acid solution to remove, and restore its temperature)^[10]. Buffer solution after device complete inspection, and will detect probe solution treated specimens, positive control fluid, the system put together, make sure that every pore total volume in 100 (including, placing it into 96-well plates).

Table 1. Comparison of TCT and HPV test results

TCT results	HPV	
	Positive	Negative
Normal versus inflammatory ($n = 339$)	44 (12.98)	293 (86.43)
Atypical squamous cells of undetermined significance ($n = 18$)	15 (83.33)	3 (16.67)
Atypical squamous cells ($n = 13$)	11 (84.63)	2 (15.39)
High-grade squamous intraepithelial neoplasia ($n = 10$)	9 (90.00)	1 (10.00)
Low-grade squamous intraepithelial neoplasia ($n = 22$)	20 (90.91)	2 (9.09)

Note: Compared with the positive rate of normal and inflammation, $P < 0.05$

Table 2. Comparison of pathological test, TCT and HPV test results

Pathological test	TCT (+)		TCT (-)	
	HPV (+)	HPV (-)	HPV (+)	HPV (-)
CIN grade I	16 (53.33)	3 (75.00)	1 (50.00)	1 (100.00)
CIN II	8 (26.67)	1 (25.00)	1 (50.55)	0
CIN grade III	5 (16.67)	0	0	0
Squamous cell carcinoma	1 (3.33)	0	0	0

In the process of research, the probe solution samples should be extracted and used as control samples, and the fluorescein-labeled substrates should be put into the substrate within 3.5 h of the incubation time. The culture plate colorimeter should be effectively used for monitoring, and the number of photons should be analyzed, and the results should be obtained automatically by the calculation software. Finally, if there are problems in pathological examination and positive indicators are detected, the corresponding tissues need to be collected, and routine staining and plate-sealing operations need to be carried out. The detection personnel need to make a judgment according to the phenomenon. The histopathological diagnosis included chronic cervicitis, CIN I, CIN II, CIN III, and squamous cell carcinoma (**Table 2**).

2.3. Observation indicators

The pathological examination results of patients were regarded as the core indicators, and the results of TCT and HPV detection were recorded respectively, and the value of the two detection methods was judged.

2.4. Statistical processing

SPSS 22.0 statistical software was used for data out rate, technical data were checked by (χ^2), measurement data were checked by (t), and measurement data were checked by (t). $P < 0.05$ also indicated that the difference was statistically significant.

3. Results

3.1. TCT and HPV test results

After TCT detection, the positive rate of HPV detection in the normal and inflammation group was higher than

that in the non-squamous cells of undetermined significance group, atypical squamous epithelial cells group, high-grade squamous intraepithelial neoplasia group and low-grade squamous epithelial neoplasia group (Table 1).

3.2. Pathological analysis

Hospital after pathologic examination, show CIN I level above, a total of 39 cases of TCT positive test results in 34 cases, the positive rate was 87.18% (34/37), positive for HPV test result in 32 cases, the probability of positive for (32/37), no difference, both positive probability was not statistically significant.

3.3. Analysis of sensitivity and specificity

According to the analysis of sensitivity and specificity of detection, are higher than that of TCT and HPV ($\chi^2 = 7.215, 9.677, 5.504, 8.277, P < 0.05$), as shown in Table 3.

Table 3. Comparison of sensitivity and specificity of TCT and HPV test results

Methods of detection	Sensitivity	Specificity
TCT	78.38 (29/37)	85.12 (309/363)
HPV	75.67 (28/37)	82.09 (298/363)
Combined testing	91.89 (34/37)	95.04 (345/363)

Note: Compared with combined detection, $P < 0.05$

4. Discussion

Under the background of a declining fertility rate, China has entered the aging stage, and the number of middle-aged and elderly people suffering from cervical cancer is increasing. According to the data analysis, among the women with cervical cancer, women over the age of 60 account for 20% of the total number, and 35% of the mortality rate is related to cervical cancer, which is also known as the main disease affecting women's lives. Therefore, it is necessary to do a good job in the prevention of precancerous lesions, so as to help reduce the mortality rate [11]. However, at present, most middle-aged and elderly women do not pay enough attention to gynecological examinations. They do not pay attention to this examination, which also leads to many patients finding cervical cancer late and the condition is relatively serious, which is not conducive to subsequent treatment.

In the current era, cervical cancer has become one of the dangerous diseases threatening women's health. It has also been paid attention to by governments and health departments of various countries. According to the research of governments and health departments, more than 90% of cervical cancer can be prevented by biennial screening. Therefore, it is necessary to choose the best plan when screening, and find and solve problems in the first place. The onset time of cervical cancer is generally after 35 years old, and the peak age is between 45 and 49 years old [12-14]. During the childbearing age of women, a lot of cervical lesions are found in a timely manner, but after menopause, women ignore the problem of cervical cancer pathological changes, it also led to the discovery of cervical cancer later after menopause, where the condition is more severe, with higher death probability.

Postmenopausal women produce changes in the body, estrogen levels continue to rise, also the glycogen

is reduced in skin cells, reducing the amount of lactic acid secretion of the whole, this also leads to an elevated vaginal PH, limiting the growth of bacteria, local resistance ability has fallen sharply, risk of infection. Compared with pre-menopausal women, post-menopausal women are more likely to develop a series of chronic inflammations. When compared with the previous report, if vaginal mucosa of lactobacillus levels change, it is likely to be threatened by the pathogens, leading to microbial environment change in the vagina, phenomenon of cervical epithelial hyperplasia, or even deteriorated, and finally leads to cervical cancer^[15]. If cervical cancer screening is done on a regular basis, it helps to discover the phenomenon of precancerous lesions avoiding more problems. In clinical practice, pathological biopsy is usually used as an important reference basis, but it is not conducive to widespread use because of its certain risks. The traditional method of cell detection is the use of Papanicolaoh smear, which has a high false negative rate, and is gradually replaced by TCT.

With the development and progress in the field of medicine and clinical detection technology, the TCT test achieved a good effect, it also became the screening of cervical lesions. After practice, the positive probability of HPV test in the normal group and the inflammation group is higher than that in other groups. After pathological diagnosis and test, there were 39 patients with CINI or above, among whom there was no significant difference in the positive probability of TCT and HPV. Therefore, it is needed to take full advantage of the way of joint detection, improve the detection precision and improve the sensitivity and specificity of screening, avoid even the appearance of diagnostic errors, do a good job in screening of high-risk groups, do a good job in the corresponding intervention better protecting the patient's health.

Cervical cancer is usually under the influence of many factors. However, HPV infection is the primary condition, and preventing HPV infection also prevents cervical cancer. Research indicates that at the present stage, the basis of a single HPV testing can be used for the crowd screening, to determine the level of the development of women's risk is higher. In this study, the use of two kinds of TCT and HPV screening analysis way, realized that only the TCT and HPV detection together can better screening for cervical cancer, this helps to improve the precision of the inspection.

5. Conclusion

In conclusion, the effective use of TCT examination combined with HPV examination in cervical cancer screening in postmenopausal women has a good effect, which is helpful for better implementation and promotion, thus helping more patients to treat the disease and carry out later recovery.

Disclosure statement

The authors declare no conflict of interest.

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