

Screening and risk assessment of early stage cervical cancer in health examination population

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Abstract: Cervical cancer is one of the most common diseases in female, seriously threat women's health, easily lead to cancer or death. This study was to explore early cervical cancer by screening of health examination population and risk assessment, and then to reduce the incidence of cervical cancer. In our hospital, 2002, early stage cervical cancer cases by screening of health examination population were the research object. Cervical cancer cases, colposcopy testing and pathological biopsy cases were given questionnaires. All the data were analyzed using single factor and multiple factor analysis method. Among the health examination population, 202 cases were given colposcopy testing in our hospital. 1800 cases were accepted the colposcopy testing and pathological biopsy. Among them, 150 cervical cancer patients were found. The clinical features of the tumor were the lower stage, the histological higher differentiation. The pathology types were mainly squamous cell carcinoma and adenocarcinoma. One way-ANOVA results showed that the early sage cervical cancer risk factors included: HPV infection, age at menarche and sexual life, personal hygiene habits, smoking, age and education level, which had little effect on cervical cancer. Multivariate logistic regression analysis showed that independent risk factors of cervical cancer were HPV infection or not (OR=2.023), age at menarche and sexual life (OR=1.347) and personal health habits (OR=1.248). HPV infection or not, age at menarche and sexual life, personal hygiene habits are independent risk factor for early cervical cancer. Screening and risk assessment have benefit for the prevention and treatment of cervical cancer occurrence and development, which also can effectively reduce cervical cancer complications and mortality.

Keywords: Physical examination; Early stage; Cervical cancer; Screening; Risk assessment

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1. Introduction

Precancerous lesions of the cervix are the lesion that occurs before the occurrence of the cancer, and thus causes the cancer. Cervical precancerous lesions are cervical severe intraepithelial neoplasia (CIN3). The occurrence and development of cervical cancer is a gradual processes, it maybe from a few years to decades. This evolution has several stages: mild, moderate and severe epithelial tumor like lesions, early infiltrating carcinoma, invasive carcinoma. Patients with cervical precancerous lesions generally have not obvious symptoms, or only the general cervicitis symptoms, such as more vaginal discharge. There are complaints of leucorrhoea blood or sexual contact vaginal bleeding etc. Severe cervical intraepithelial neoplasia is a precancerous lesion, which is reversible. Some of the lesion can disappear naturally, but it also has the progress. The lesions can be developed, and even become into cancer. The reversibility and development of the disease were related to the extent and degree of the lesion. The slight spontaneous disappearance of mild epithelial tumor like lesions was significantly higher than that in moderate or severe cases. The possibility of the development of severe epithelial tumor like lesions was significantly higher than that of mild and moderate cases.

Some scholars believe that the slight cervical mild intraepithelial neoplasia is a benign abnormal proliferation which can naturally turn to normal. In recent years, cervical cancer shows a trend of youth. It

is seriously threat to the quality of life. The cervical Colposcopy testing and PCI score system were used to the transitional zone, which can help the diagnosis and observation, and improving the accuracy of in the high risk population. The disease can be diagnosed according to the standard of pathology. The positive and negative predictive values are applied as the statistical index, which can accurately diagnosis this disease. Histopathological examination is the "gold standard" for diagnosis of cervical cancer.

The occurrence and development of cervical cancer is from quantitative to qualitative changing process. Cancer screening and prevention precancerous lesions can significantly reduce the prevalence and the death. Early detection, diagnosis and treatment can significantly improve the prognosis of patients [1].

Therefore, how to achieve early detection, early diagnosis and treatment are the focus by scholars and clinicians. At present, the research on the risk assessment of this disease is the key to study of cervical cancer. There are little literatures. In order to explore the screening early cervical cancer and risk assessment, this study achieved good results, and now the results are reported as follows.

2. Data and methods

2.1. General information

Our study was approved by our hospital medical

ethics committee, to ensure all participants true and voluntary. From January 2014 to October 2015, 2002 early stage cervical cancer by screening of health examination population was the research object. The average age is (51.15±9.24), married women of childbearing are 700 cases. If cases have heart, liver, kidney and other serious diseases were excused. If cases combined with other tumor, pregnant women, ovarian cut, the history of cervical cancer were also excused.

2.2. Method

Cervical cancer screening: first step is specimen collection and production. Selection of cervical canal brush along the clockwise for 6 circum, collecting deciduous epidermal cells of the cervix, placed with cell preservation liquid container, and then rinse, removal of cervical mucus, for the separation and filtering operation and Papanicolaou stain. In the case of the colposcopy testing, the acetic acid was carried out on the positive cells and given the biopsy by colposcopy testing. In 3, 6, 9, 12 clocks was given routine biopsy and parallel cervical curettage respectively.

The colposcopy PCI score, score for colposcopy description of edge, color and vessels, iodine reaction, histopathological examination positive predictive value, negative predictive value and risk assessment are the basis. According to TCT and colposcopy PCI score comparison, colposcopy PCI score of 0-5 is low risk, 6-8 is high risk.

Due to various factors, in 2002 cases of cervical cancer screening by physical examination population, there are 202 cases are not finish the hospital for vaginal examination. Only 1800 cases finished physical examination women in the hospital were accepted the pathological biopsy. Finally we confirmed 150 cases of cervical cancer. Then the 1800 cases were completed the test of the physical examination of the biopsy. The patients were given the factor study: special investigation team, self-made questionnaire, the investigating of all physical examination.

Survey includes: age (less 39 years of age, more than 40 years old), education (below junior middle school, junior high school and above), smoking, whether the infection HPV (HPV detection using second-generation hybrid capture technology), female personal hygiene (in a good personal hygiene habits of women: often a bath, frequently change underwear,

routine health clean vulva, both clean before and after sexual life, her husband wrapping too long, personal badness hygiene habits), the age of menarche and sexual life. First of all, the above factors were analyzed by one way-ANOVA analysis. Basis on analysis, the effective factor was employed the multi-factor analysis.

2.3. Observation index

(1) The results of early stage cervical cancer. Including: the positive rate of cytology, TCT biopsy positive rate, TCT biopsy negative rate, low risk rate, high risk rate. The low risk rate of the critical value is 1/270.

(2) Single factor and multi factor analysis method to evaluate the risk of cervical cancer. First, the factors (age, educational level, whether the infection of HPV, age at menarche and sexual life, personal hygiene habits, smoking) were given single factor analysis. Then multivariate analysis was finished.

2.4. Statistical methods

Using SPSS17.0 statistical software to analyze the experimental data, the measurement data were tested by T test. The positive rate and the negative rate were expressed as the percentage, and the data were analyzed by χ^2 test.

3. Results

3.1. Early stage cervical cancer physical examination results

The positive rate of cytology was 8.33%. The total number of TCT biopsy was 1800, the positive rate of TCT was 5.50%, and the TCT negative was 2.83%. There were 44 cases of low risk patients, 55 cases of high-risk patients, as shown in the following table.

3.2. Early Stage Cervical Cancer Risk Assessment Single Factor Analysis

According to statistics, we found that the early stage cervical cancer risk factors included whether infection with HPV, age at menarche and sexual life, personal hygiene habits, smoking in early-stage cervical cancer risk factors. Age and education level of early cervical cancer incidence had no correlation (Table 2).

Table 1 Examination results of early stage cervical cancer (n=1800).

Cytology positive rate	TCT positive rate	TCT negative rate	low risk rate	high-risk rate
150	99	51	44	55
8.33	5.50	2.83	44.44	55.56

Table 2 Single factor analysis of risk factors for early stage cervical cancer (n=1800).

Factor	Number	Cervical carcinoma	χ^2	P	
Age	≤39	470	20	1.90	>0.05
	≤40	1330	79		
Educational level	Primary school	1100	62	0.10	>0.05
	Junior high school and above	700	37		
Personal hygiene habits	Badness	1314	85	8.79	<0.05
	Good	486	14		
The age of menarche and sexual life	Badness	360	34	13.47	<0.05
	Good	1440	65		
Smoking	+	1120	49	7.22	<0.05
	-	680	50		
Infection of HPV	+	480	44	16.93	<0.05
	-	1320	55		

3.3. Early Stage Cervical Cancer Risk Assessment Multivariate Logistic Regression Analysis

Meaningful variables by single factor analysis were analyzed by logistic regression, results shown: early cervical cancer independent risk factor respectively is: whether or not infected with HPV (OR=2.023), menstrual menarche age and sex OR=1.347 and personal health habits OR=1.248. See Table 3 for details.

4. Discussion

HPV is a high-risk human papilloma virus, which is an important factor of cervical cancer. The study shows that the risk of cervical cancer in patients with HPV infection is significantly higher than that of non infected persons [2]. Lu Qinyan found reproductive tract infections in high-risk types of HPV is the independent risk factor of cervical cancer. All cervical cancer patients with high-risk HPV infection were positive, CIN II and III 97.00% are positive, CINI has positive 61.4% HPV. Infection is a necessary condition for the occurrence of cervical cancer. HPV infection and the severity of the disease is an important basis for cervical cancer screening [3]. Chi Yaqin also believes that early screening for HPV, HPV positive and cervical normal high-risk patients for regular follow-up and physical examination, to carry out lectures and health preach, can effectively reduce the risk of cervical cancer [4].

Early menarche, sexual behavior, sexual disorders have stronger correlation with early cervical cancer. Menarche was influenced by estrogen and progesterone. The earlier menstruation menarche, the longer influence of estrogen and progesterone is. In vivo hormone instability may increase cancerous risk. Therefore, earlier menarche can influence cervical

cancer [5]. Premature sexual behavior refers to women younger than 18 years. A large number of studies have found that young women, especially women under the age of 20, premature sexual behavior, sexual life disorder, at the same time a number of sexual partners are the major cause of cervical cancer [6]. In addition, if the husband has prepuce or phimosis, his wife occurrence of cervical cancer increases. If her husband suffers from prostate cancer and carcinoma of penis or his ex-wife suffering from cervical cancer, as well as men object of sex, she has higher risk for cervical cancer. Less than 20 years old women reproductive tract development is not yet fully mature, premature sexual life can easily lead to cervical injury, and then cervical squamous metaplasia or atypical hyperplasia, then increase the risk of cervical cancer [7]. Research work shows that low 20 years old married women who suffering from cervical cancer is 1.58%. Over 21 years old married women the prevalence rate is 0.37%. Premature sexual life is an important factor of female cervical health, which leads to cervical cancer. The later is the protective factor for the prevention of cervical cancer [8].

Sexual life of premature women, the incidence of cervical cancer is 4 times higher than the beginning of sexual life after 18 years old. It has been confirmed. If a woman has a sexual relationship with a number of men, there are more opportunities for cervical cancer. More than 2 fixed sex partner the women, the cervical cancer rate is 1.08%. Over 3 none fixed sex partner the women cervical cancer rate can up to 4.31% [9]. Many times marriage will lead to the incidence of cervical cancer increasing. Multiple delivery and perinatal will increase the incidence of cervical cancer. It is very clearly, female sexual life disorder and long-term sexual partner can increase cervical cancer risk.

Table 3 Multivariate Logistic regression analysis for risk assessment of early stage cervical cancer (n=1800).

Impact	β value	Standard error	Wald χ^2 value	P	OR	95% CI
Smoking	0.422	0.847	0.923	0.054	0.334	1.947~0.724
The age of menarche and sexual life	0.798	0.862	0.984	0.035	1.347	0.258~0.926
Infection of HPV	1.392	0.958	1.426	0.030	2.023	1.493~2.583
Personal hygiene habits	0.687	1.210	1.134	0.043	1.248	1.038~2.285

A large number of studies of International Cancer Center have confirmed that smoking is an important factor in the occurrence of cervical cancer. Smoking is harmful to human health. The Brazil researchers found that smoking is an important influence factor of oral cancer, laryngeal cancer, cervical cancer [10]. Further study shows that not only women's own smoking will seriously affect the cervical lesions, second smoking is also a great threat to women's cervical cancer [11-14]. Personal health is also an important factor for cervical cancer. Seldom taking a bath and cleaning the vulva cause cervical cancer incidence rate rise. Husband prepuce, life health are also important influence factors. Prepuce too long easily leads to breeding of dirt, bacterium and virus threat women, then increase the risk. In addition, the couple sexual life is not clean, before and after the sex do not clean, do not pay attention to health, is very easily to induce cervical cancer [15-20].

This study shows that infection with HPV, age at menarche and sexual life, personal hygiene habits, smoking are the risk factors of cervical cancer. Age and educational level has little effect on cervical cancer, which may be original cervical cancer incidence in elderly women. In recent years, with the disease of younger, prevalence of female rate is significantly increases. Education level maybe influence on women living habits and clean sex. Education level has no influence on the women cervical cancer incidence. In general, late marriage and childbearing, family planning, avoid cervical injury, pay attention to hygiene can decrease the women cervical cancer. Man's foreskin too long should be cut, often remove the foreskin dirty, keep the genitals clean. For other reasons, hysterectomy should be done before the operation, therapy chronic inflammation, treat of precancerous lesions. Women should actively participate in the survey of women's diseases, pay attention to prevention and treatment of chronic cervical disease, aggressive treatment of cervical precancerous lesions such as erosion of cervix, cervical condyloma and cervical atypical hyperplasia. Family planning, late marriage and late childbirth, popularization of health knowledge, strengthen the health care of women, actively strengthen sex education, prevention and treatment education will benefit for this disease. Understanding of the cause of cervical cancer, we should know how to prevent

woman cervical cancer. So many patients with cervical cancer are not understand the cause of cervical cancer, cannot give the good prevention for cervical cancer. Therefore, the rate of cervical cancer is high. Basis on this article finding, we can prevent cervical cancer better.

Because of easy exposure, easy to observe of the cervix, so screening for the disease is very favorable. And it shows that cervical cancer can be prevented and treated. Therefore, early detection and intervention can avoid the occurrence and development of cervical cancer, which can reduce cervical cancer complications and mortality.

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