

Clinical efficacy of cryotherapy combined with interferon in the treatment of chronic cervicitis complicated with HPV infection

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Abstract: This paper aims to investigate the clinical curative effect and adverse reactions of cryotherapy combined with interferon in the treatment of chronic cervicitis complicated with HPV infection. 100 cases diagnosed with chronic cervicitis complicated with HPV infection from August 2014 to August 2015 in our hospital were selected and randomly divided into observation group (50 cases) and control group (50 cases). The preoperative and postoperative HPV-DNA changes were observed, and the vaginal discharge, time of decrustation and hemostasis, HPV negative conversion ratio and clinical efficacy were compared, to record the adverse reactions during treatment. After treatment, the level of RLU/CO value of the observation group was significantly lower than that of the control group ($P < 0.05$); the vaginal discharge and time of decrustation and hemostasis of the observation group were shorter than that of the control group ($P < 0.05$); 3 months after treatment, the HPV negative conversion ratio in the observation group was significantly higher than that in the control group; the total efficiency of the observation group was higher than that of the control group, with statistical significance ($P < 0.05$). There were no serious adverse reactions in the two groups during the treatment. The efficiency of cervicitis complicated with HPV infection in the treatment of cryotherapy combined with interferon was more significantly. It can effectively reduce the load of HPV, promote the recovery of patients with pathological changes. Therefore, it is worth promoting.

Keywords: Chronic cervicitis, human papilloma virus, interferon, cryotherapy.

INTRODUCTION

Chronic cervicitis is a common disease in gynecological disorders. Its mainly due to the childbirth, surgery and other damages to the patient's cervix, causing *Staphylococcus*, *Streptococcus* and other pathogens into the wound, thus resulting in infection. The clinical symptoms were manifested as a large amount of vaginal discharge, bloody vaginal discharge, etc (Zhong and Tan, 2015; Kozliuk *et al*, 2003). Human papilloma virus (HPV) infection is an important factor in the pathogenesis of chronic cervicitis, while the incidence of cervicitis will increase the positive expression of HPV. Therefore, there is a close relationship between them (Baiv *et al*, 2015; Sima *et al*, 2007). HPV is a double-stranded closed circular DNA virus with strong epithelium, high tissue specificity and host specificity, but there's no cross infection between races. The epithelium of the genital tract in patients with cervicitis is thinner, resulting in less normal mucus secretion. Therefore, it is vulnerable to sexual life, leading to HPV invasion, then increasing the incidence of infection. While after infection with HPV, immune function will lose its balance, further increase the chance of cervicitis infection.

Cryotherapy has the principle of rapid freezing and slow rewarming in clinic, which can increase the lethality of the cells in diseased tissue (Tang and Huang, 2013). The principle of cryotherapy is to quickly produce low

temperature with the refrigerating fluid, then the cryogenic frozen head and the cervical lesions tissues were in contact with each other so as to block the local blood circulation. And these tissues will degenerate and fall off due to erosion and necrosis, and the wound will be improved after tissue repair. In addition, cryotherapy also contains the effect of anesthetic and analgesic, so that the intraoperative discomfort is not easy to occur, and the local blood contraction will also have a certain hemostatic effect. The main function of interferon in clinic is anti viral, anti tumor and immune regulation (Yu and Zhu, 2013). In this study, cryotherapy combined with interferon therapy adopted in the treatment of chronic cervicitis complicated with HPV infection, and the clinical efficacy was observed.

MATERIALS AND METHODS

General information

100 cases diagnosed with chronic cervicitis complicated with HPV infection from August 2014 to August 2015 in our hospital were selected and randomly divided into two groups, namely, observation group (50 cases) and control group (50 cases). Patients in the observation group were aged between 21-56 years old, with an average age of (43.81 ± 3.45) years old, of which mild cervicitis was found in 31 cases and severe cervicitis in 19 cases. Patients in control group were aged between 20-57 years old, with an average age of (44.13 ± 3.26) years old, of which mild cervicitis was found in 34 cases and severe cervicitis in 16 cases. There was no significant difference

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in general data between the two groups ($P < 0.05$). The present study had been approved by the ethics committee of our hospital, and informed consent was obtained from all patients involved in this study.

Inclusion criteria: (1) Consistent with the diagnostic criteria for HPV (Zhao *et al.*, 2006); (2) Women with normal sexual life and non pregnancy, no oral contraceptives. Exclusion criteria: (3) Cervical carcinogenesis; (4) Abnormal coagulation function; (5) Vaginal secretions showed Trichomonas, fungi and other infections.

Methods

Patients in control group were treated with simple cryotherapy with Erbokryo CA multi-function cryotherapy therapeutic instrument and the treatment time was 3-7 days after the menstrual clean. Proper probe was selected according to the different lesion area and depth of patients. When the freezing probe touched the cervix, CO₂ gas was used to freeze the cervical surface for continue 3 min, the unfroze after interval 5 min. In the observation group, 1 interferon suppository was placed in the posterior fornix of the vagina after cryotherapy, once every other day. Patients in both groups were all treated for a period of three months.

HPV-DNA levels in the samples were detected by HC II produced by Digene, Inc. When RLU/CO \geq 1, the results of HPV-DNA was positive (Cohen *et al.*, 2017).

Observation index

The preoperative and postoperative HPV-DNA changes were observed, and the vaginal discharge, time of decrustation and hemostasis, HPV negative conversion ratio and clinical efficacy were compared, to record the adverse reactions during treatment.

Efficacy evaluation criteria

According to the relevant literature, the curative effect evaluation criteria were divided into cure, excellence, improvement, failure (Lin, 2014). Cure referred that the patient's cervical erosion and cyst symptoms disappeared after treatment, with smooth cervix and normal vaginal discharge; Excellence indicated that the cervical erosion surface was reduced 1/2 after treatment, and a variety of clinical symptoms had disappeared; Improvement suggested that the cervical erosion surface had a certain degree of improvement after treatment, and the reduced area was less than 1/2; Failure showed that the cervical erosion did not appear improved after treatment, and no significant changes in clinical symptoms or even worse.

STATISTICAL ANALYSIS

SPSS software was used for data analysis. The measurement data were expressed as mean \pm standard deviation ($\bar{x} \pm s$), and t test was used. The χ^2 test was used

to compare the enumeration data, and rank sum test was used to compare the ranked data. $P < 0.05$ meant that the difference was statistical significance.

RESULTS

Changes of HPV-DNA values before and after treatment in both groups

Before treatment, there was no significant difference in the RLU/CO value between the two groups ($P > 0.05$). After treatment, the RLU/CO value of the observation group was significantly lower than that of the control group, and the difference was statistically significant ($P < 0.05$) (table 1).

The vaginal discharge and time of decrustation and hemostasis in both groups

After treatment, the vaginal discharge and time of decrustation and hemostasis in the observation group were shorter than those in the control group, and the difference was statistically significant ($P < 0.05$) (table 2).

Comparison of HPV negative conversion ratio in both group after treatment

One month after treatment, the HPV negative conversion ratio in both group was not significant ($P > 0.05$); three month after treatment, the HPV negative conversion ratio in the observation group was higher than that of the control group, and the difference was statistically significantly ($P < 0.05$) (table 3).

Clinical efficacy in both groups after treatment

After treatment, the total effective rate of the observation group was significantly higher than that of the control group, and the difference was statistically significant ($P < 0.05$) (table 4).

Adverse reactions in both groups during treatment

During the treatment, there were 2 cases in control group with vaginal bleeding, maintained about 1-3 days. But the symptoms were mild, so it won't affect the normal life and work. No adverse reactions occurred in the observation group. There was no significant difference in adverse reactions between the two groups ($P > 0.05$).

DISCUSSION

If the development is serious, chronic cervicitis will lead to concurrent salpingitis, infertility, urinary tract infections and other diseases. Studies have shown that women aged between 25-45 years old have a very high incidence of cervicitis, due to its higher frequency of sexual life (Hao *et al.*, 2014; Zhong, 2014). In the past, laser and microwave were often used in the treatment of these patients, but these methods will make the patient's cervical scar, which will affect the normal vaginal delivery in the future, and will expand the cervix, increase

Table 1: Changes of HPV-DNA values before and after treatment in both groups ($\bar{x}\pm s$)

Grouping	Cases	RLU/CO value		t ₂ value	P ₂ value
		Before treatment	After treatment		
Observation group	50	348.23±78.23	5.89±1.02	30.9409	0.0000
Control group	50	342.95±79.15	65.94±13.68	24.3858	0.0000
t ₁ value		0.3355	30.9534		
P ₁ value		0.7380	0.0000		

Annotation: 1 was comparison of control group and observation group; 2 was comparison of before and after treatment within the group

Table 2: The vaginal discharge and time of decrustation and hemostasis in both groups ($\bar{x}\pm s$, d)

Grouping	Cases	Vaginal discharge	Time of decrustation and hemostasis
Observation group	50	10.23±2.61	5.20±1.21
Control group	50	18.56±3.35	7.83±1.63
t value		13.8700	9.1609
P value		0.0000	0.0000

Table 3: Comparison of HPV negative conversion ratio in both group after treatment [n(%)]

Grouping	Cases	1 month after treatment	3 month after treatment
Observation group	50	13 (26.00)	25 (50.00)
Control group	50	7 (14.00)	11 (22.00)
t value		2.2500	8.5069
P value		0.1336	0.0035

Table 4: Clinical efficacy in both groups after treatment [n(%)]

Grouping	Cases	Cure	Excellence	Improvement	Failure	Total effective rate
Observation group	50	18 (36.00)	15 (30.00)	14 (28.00)	3 (6.00)	47 (94.00)
Control group	50	13 (26.00)	14 (28.00)	11 (22.00)	12 (24.00)	38 (76.00)
u/ χ^2 value		u=1.7615				$\chi^2=6.3529$
P value		P=0.0782				P=0.0117

the probability of subsequent cesarean section (Qiu, 2014; Shan *et al*, 2013). Cryotherapy won't cause a large scar on the patient, nor appear the cervical canal stenosis, which is a more appropriate option for women with reproductive requirements. Therefore, cryotherapy combined with interferon is used in our hospital in the treatment of chronic cervicitis complicated with HPV infection.

Interferon binds to the interferon receptor on the surface of focal cells to induce the synthesis of an antiviral protein from intracellular 2~5A, thereby inhibiting the synthesis, replication and transcription of the viral protein, thereby achieving the goal of antiviral. The treatment of vaginal interferon treatment can promote the absorption of the mucosa, and the drug can directly play a role in the deep cervical tissue. Furthermore, interferon can also increase the phagocytic function of macrophages, increase cell lethality, thereby inhibiting the proliferation of tumor cells. In addition, the immune system of the body can be increased by adjusting the level of estradiol and progesterone in the body, so that the epithelial cells

can be quickly repaired, and further promote the early healing of the cervical erosion surface. The results in our hospital showed that after cryotherapy combined with interferon treatment, the RLU/CO value of patients is significantly decreased, and the vaginal discharge and time of decrustation and hemostasis are significantly shorter than those patients treated with cryotherapy alone. The detection results of HPV negative conversion ratio also have shown that the patients with combined treatment have a higher negative conversion ratio, and the total effective rate of clinical treatment is as high as 94.00%, significantly higher than that of patients treated with cryotherapy alone (76.00%), indicating that cryotherapy combined with interferon treatment can more effectively reduce the expression of RLU/CO value, promote the recovery of cervical tissue, and the effect is more significant. During the treatment, patients should be reminded to avoid sexual life as far as possible, so as to further improve the therapeutic effect. This is due to combination of interferon and cryotherapy not only plays a role in antiviral, but also plays a role in synergism of promoting the recovery of tissues. There was no

significant difference in adverse reactions between the two groups, indicating that interferon has a high security.

CONCLUSION

In conclusion, the efficacy of cryotherapy combined with interferon in patients with cervicitis complicated with HPV infection is more significant, which can effectively reduce the load of HPV, promote the recovery of pathological tissues. Therefore, it is worthy of clinical application.

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