

## CLINICAL VALUE OF CHEMORADIOTHERAPY IN PATIENTS WITH ENDOMETRIAL CANCER BASED ON HEALTH INFORMATICS: A META-ANALYSIS

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### ABSTRACT

**Objective:** Based on the meta-analysis of health informatics, the effects of combined chemoradiotherapy and radiotherapy alone on postoperative survival rate and complications of endometrial cancer patients were compared.

**Methods:** Study engineering and computer by health interest rates in ten thousand medical, PubMed database, domestic research on medical journals such as health and biomedical literature database for information retrieval, the direction of radiation in the combined chemotherapy in patients with endometrial carcinoma postoperative survival rate and the influence of complications such as indicators of health information related literature, on the basis of health informatics chosen Rev Man 5.2 software for Meta analysis.

**Results:** According to the research object, method, disease type and other criteria, the retrieval literatures were screened, and a total of 7 literatures that met the criteria were finally included, with low publication bias. Meta analysis results showed that the 5-year OS, 5-year progression-free rate and treatment complication rate of the radiotherapy combined with chemotherapy group were all higher than those of the radiotherapy alone group, and the 5-year recurrence rate of the radiotherapy combined with chemotherapy group was significantly lower than that of the radiotherapy alone group, with statistically significant differences ( $P < 0.05$ ). The sensitivity test results showed that the heterogeneity of the literature was small and had high reference value.

**Conclusion:** Radiotherapy in combination with chemotherapy can obviously reduce postoperative recurrence rate, endometrial cancer patients can prolong the overall survival and progression-free rate at the same time, is worth popularization and application, but the combination therapy may increase the risk of patients with postoperative complications, is a new challenge in the field of health care, is creating a new era in medical areas must overcome one difficulty, should actively learn the new complication protection knowledge and skills, adopt effective protective measures to reduce the incidence of complications and complications for patients life security, create a new era of the radiation and chemotherapy treatment.

**Keywords:** Radiotherapy, endometrial carcinoma, meta analysis, adjuvant chemotherapy, overall survival rate, health informatics, complications, a new challenge.

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### Introduction

Endometrial cancer is a common malignant tumor in women, and its onset age tends to be younger<sup>(1)</sup>. Ill patients with early symptoms associated with abnormal vaginal bleeding, poor prognosis of patients with the class and higher risk of death and tumor metastasis, Is a serious obstacle to the development of medical technology in the new era<sup>(2, 3)</sup>. Therefore take effective treatment in patients with

endometrial carcinoma is important, more is given priority to with surgical treatment, postoperative radiotherapy, chemotherapy and combined radiation and chemotherapy and so on for auxiliary treatment, combined radiation and chemotherapy is a new in patients with endometrial cancer medical progress, but the specific efficacy of postoperative adjuvant radiation and chemotherapy treatment is not yet clear, and still have considerable controversy safety and effect of combined radiation and chemotherapy, is to ensure the safety of life and promote the devel-

opment of medical field faces a new challenge<sup>(4,6)</sup>. To further explore the effect of radiotherapy combined with chemotherapy in the treatment of endometrial cancer, in this study, 7 randomized controlled studies were retrieved and collected on the basis of health informatics. Meta analysis was made on the application value of combined chemoradiotherapy and radiotherapy alone in patients with endometrial cancer, laying a foundation for the progress of medical technology.

## Materials and methods

### *Research types*

Studies and trials are of the randomized Controlled Trials (RCTS) type.

### *Literature retrieval*

Adjuvant therapy, radiotherapy, endometrial cancer, recurrence, chemotherapy, 5-year overall survival rate, Adjuvant therapy, radiotherapy, endometrial cancer, investigation, 5-year overall survival rate and so on can all be selected as retrieval keywords. In domestic biomedical research journals, Wanfang database, PubMed and other medical journal databases, relevant literature on the influence of chemoradiotherapy on postoperative survival rate and complications of endometrial cancer patients in recent 10 years was collected by computer. You can also contact the relevant field experts, pharmaceutical companies for information. Contact the original author in case of missing documents or rough reports. Through understanding the general contents of the literature, the literature conforming to the conditions of endometrial cancer, radiotherapy, chemotherapy and so on were screened strictly. The study must be approved by the relevant authorities, the medicine boxes are all obtained through normal channels, and there are no mistakes in the operation steps during the study. At the same time, the literature is read to eliminate the insufficient literature such as duplicate content, inconsistent research methods, and lax operation, and the literature that meets the requirements is used for Meta data analysis.

### *Inclusion criteria*

- The patients met cytological and pathological diagnostic criteria and were diagnosed as endometrial carcinoma after a series of relevant examinations. Combined surgical treatment or Versus simple surgical treatment<sup>(7,8)</sup>;
- The intervention measures were adjuvant post-

operative chemoradiotherapy versus postoperative radiotherapy alone. The research objectives are not limited by nationality, age, gender, salary, race and other conditions<sup>(9,10)</sup>. During follow-up, the rate of lost follow-up was less than 20%. Research must be approved by the relevant authorities;

- The literature time is within the last 10 years. Complete clinical original data;

During the study, there was no error of operation steps. Meta analysis method was used. The contents of other treatments were the same between the control group and the experimental group except the differences of postoperative radiotherapy methods.

### *Exclusion criteria*

- The patient did not conform to the cytological and pathological diagnostic criteria and was confirmed not to be endometrial cancer or to be a patient with recurrence or metastasis of endometrial cancer after examination;
- Patients who have received radiotherapy or chemotherapy before surgery;
- Animal experiments;
- Irrelevant to the subject of the study;
- Summary, Meta, case report, summary of the meeting;
- Have a serious blood system disease;
- The rate of loss of follow-up caused by withdrawal or interruption of follow-up during follow-up is more than 20%.

No treatment was given by chemotherapy or radiotherapy.

### *Study outcome indicators*

The outcome indicators were overall survival rate (OS), five-year progression-free survival (PFS), overall recurrence rate at 5 years, and the incidence of treatment-related complications at levels 3-4.

### *Quality evaluation*

For randomized controlled studies, improved Jadad scoring scale was used to evaluate the quality of the literature, with a total score of 7, 1-3 as low quality and 4-7 as high quality. For cohort studies, the Chinese version of the modified NOS scale was used for quality assessment of the literature.

The total score of this scale is 10 points, with <5 is low quality and ≥5 is high quality.

### *Statistical treatment*

The research data was entered into Rev Man5.2 statistical software for analysis. Enumeration data are

represented by risk ratio(RR), and weighted mean difference (WMD) or standard mean difference (SMD) are presented by analysis statistics. All effects were represented by 95%confidence interval (CI).

Heterogeneity between results of each study was examined by Chi2. When the heterogeneity between studies was statistically significant ( $P<0.1$ ,  $I^2\geq 50\%$ ), the source of the property was analyzed using subgroup or sensitivity. When the interstudy heterogeneity met the conditions of  $P>0.1$  and  $I^2<50\%$ , the heterogeneity was not statistically significant, and fixed effect model was selected for Meta analysis. When the source of heterogeneity was unclear, random effect model was used for analysis, and descriptive analysis was used for obvious clinical and methodological heterogeneity.

**Results**

*Literature retrieval results and features of included studies*

After the Chinese and English databases were searched according to the search strategy, a total of 366 literatures were searched, and the literatures were screened according to the established inclusion and exclusion criteria. Finally, 7 literatures were included, among which 3 English literatures and 4 Chinese literatures. The basic characteristics and literature quality evaluation results of the included literatures showed that there were 2 articles of low quality and 5 articles of high quality. The details are presented in Table 1.

The author	Published year	Outcome indicators	Quality score
Hogberg	2010	①②③	5
Stephanie	2018	①②③④	6
Boer	2018	①②④	5
Qiu-fang wu	2015	①	3
Hu Mengda	206	①②	5
Ying-hua lu	2014	①④	5
Lin Lihong	2012	③	3

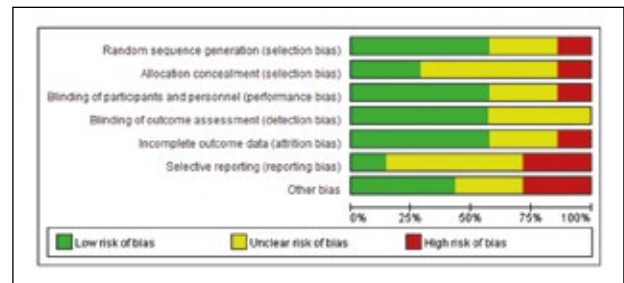
**Table 1:** Basic characteristics of literature.

Note: 5-year overall survival rate (%), 5-year progression-free rate (%), 5-year overall recurrence rate (%), postoperative complication rate (%).

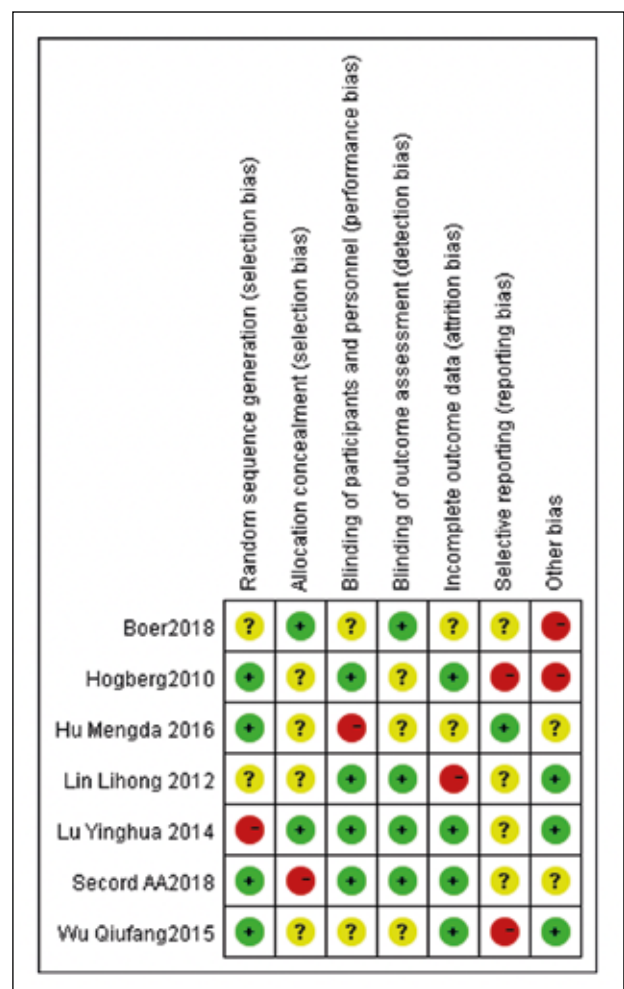
*Results of literature bias analysis*

All of the 7 included literatures contained the word "random", and all of them had multi-center characteristics. All of them made detailed explanation on the random method, and the methods were

correct. The evaluation results of publication bias showed that the risk of bias in the included studies was low, as shown in Figure 1 and Figure 2.



**Figure 1:** Literature Bias Analysis (1).



**Figure 2:** Literature Bias Analysis (2).

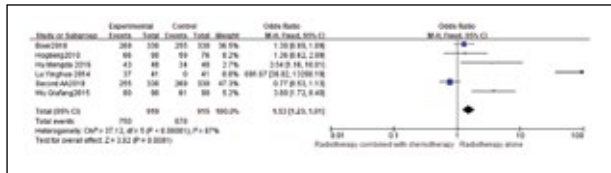
**Meta analysis results**

*Comparison of 5-year survival rate of patients with endometrial cancer after postoperative radiotherapy alone and radiotherapy combined with chemotherapy*

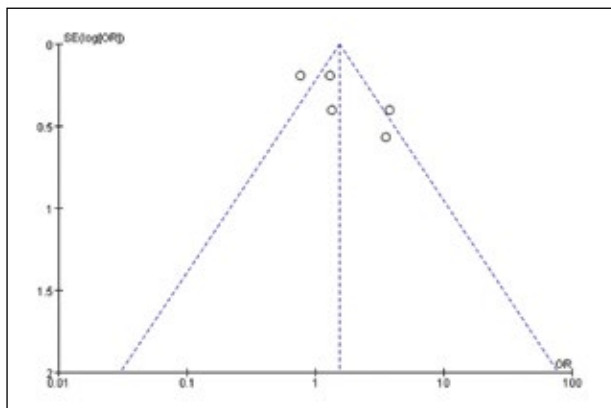
A total of 6 references were included, and heterogeneity test results showed  $I^2=87.0\%$ ,  $P<0.00001$ ; The 5-year OS of the radiotherapy combined with

chemotherapy group was 81.61%, while that of the radiotherapy alone group was 74.10%. The 5-year OS of the radiotherapy combined with chemotherapy group was significantly higher than that of the radiotherapy alone group, and the difference after all studies was statistically significant [RR: 1.53,95% CI: (1.23,1.91), P=0.0001].

It can be considered that radiotherapy combined with chemotherapy can improve patients' OS for 5 years. See Figure 3 and Figure 4.



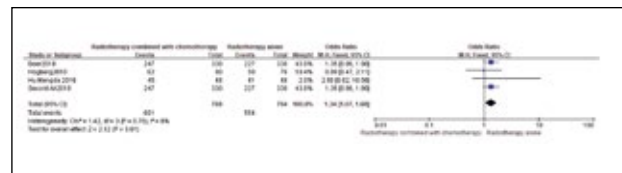
**Figure 3:** Comparison of 5-year survival rate between radiotherapy alone and radiotherapy combined with chemotherapy after operation for endometrial cancer.



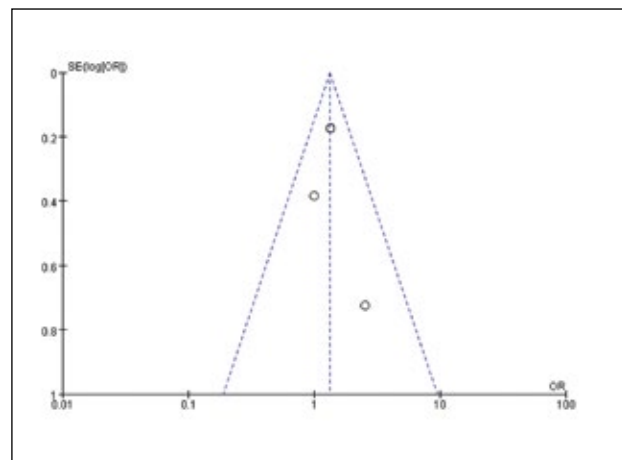
**Figure 4:** Funnel plot of 5-year survival rate of patients with endometrial cancer after postoperative radiotherapy alone and radiotherapy combined with chemotherapy.

**Comparison of progression-free rates in patients with endometrial cancer after 5 years of radiotherapy alone and radiotherapy combined with chemotherapy**

Participants included four articles, heterogeneity test results show that the  $I^2=0.0\%$ ,  $P=0.70$ , shows that into literature exists between homogeneity, the fixed effects model analysis is adopted to radiotherapy combined chemotherapy group 5 years no progress at a rate of 76.27%, and the simple radiotherapy group 5 years no progress at a rate of 70.66%, radiotherapy combined chemotherapy group 5 years no progress rate is higher than simple radiotherapy group, studies the merged difference was statistically significant (RR, 1.34, 95%CI: 1.07, 1.68),  $P=0.01$ . It is believed that radiotherapy combined with chemotherapy can increase the progression-free rate of patients for 5 years. See Figure 5 and Figure 6.



**Figure 5:** Comparison of progression-free rates of patients with endometrial cancer after 5 years of postoperative radiotherapy alone and radiotherapy combined with chemotherapy.



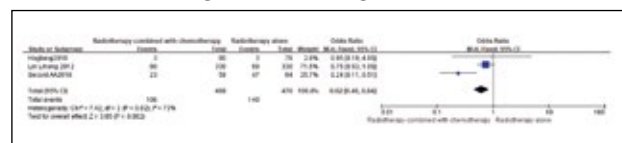
**Figure 6:** Funnel plot of progression-free rate of patients with endometrial cancer after 5 years of postoperative radiotherapy alone and radiotherapy combined with chemotherapy.

**Comparison of 5-year recurrence rate between radiotherapy alone and radiotherapy combined with chemotherapy after surgery for endometrial cancer**

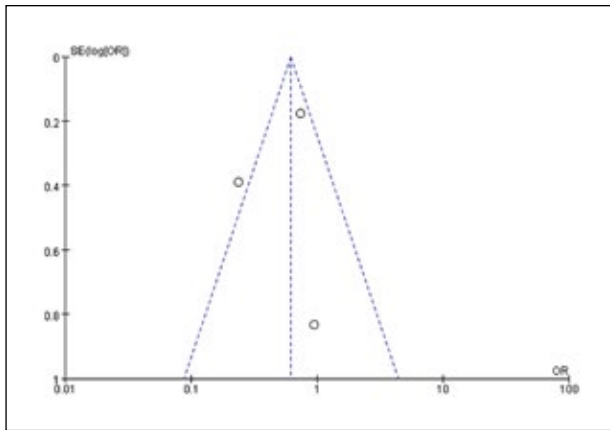
A total of 3 references were included, and heterogeneity test results showed  $I^2=73.0\%$ ,  $P<0.02$ ; The 5-year recurrence rate in the radiotherapy combined with chemotherapy group was 22.65%, while that in the radiotherapy alone group was 31.70%.

The 5-year recurrence rate in the radiotherapy combined with chemotherapy group was significantly lower than that in the radiotherapy alone group, and the difference after all studies was statistically significant [RR: 0.62, 95%CI: (0.46,0.84),  $P=0.002$ ].

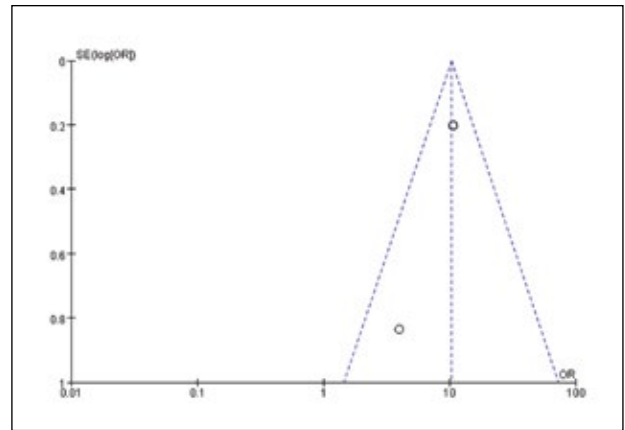
It can be considered that radiotherapy combined with chemotherapy can reduce the 5-year recurrence rate. Figure 7 and Figure 8 are attached.



**Figure 7:** Comparison of 5-year recurrence rates of patients with endometrial cancer after postoperative radiotherapy alone and radiotherapy combined with chemotherapy.



**Figure 8:** Funnel plot of postoperative recurrence rate of endometrial cancer patients after 5 years of radiotherapy alone and radiotherapy combined with chemotherapy.



**Figure 10:** Funnel plot of postoperative complications in patients with endometrial cancer treated with radiotherapy alone and combined chemotherapy.

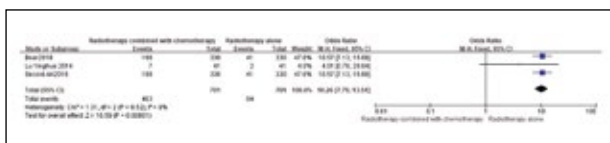
**Comparison of postoperative complications between radiotherapy alone and radiotherapy combined with chemotherapy in patients with endometrial cancer**

Participants included three articles, heterogeneity test results show that the  $I^2=0.0\%$ ,  $P=0.52$ , said into literature exists between homogeneity, application of fixed effects model analysis, the complication rate of radiotherapy combined chemotherapy group was 57.49%, only while the radiotherapy complication rate was 11.98%, the complication rate of radiotherapy combined chemotherapy group is higher than simple radiotherapy group, studies the merged difference was statistically significant (RR, 10.26, 95%CI: 7.79, 13.51),  $P<0.00001$ ].

It is believed that radiotherapy combined with chemotherapy may increase the incidence of treatment complications compared with radiotherapy alone. Attached are Figure 9 and Figure 10.

**Sensitivity analysis**

Sensitivity analysis was conducted on the 7 included literatures. After excluding and combining all the research data, the results showed that there was no significant change in the Meta results of the 4 indicators, indicating that the heterogeneity between the 7 included literatures was relatively small, so it was of high reference value. Table 2.



**Figure 9:** Forest plot of postoperative complication rates of patients with endometrial cancer treated with radiotherapy alone and chemotherapy combined with radiotherapy.

The ending	RR/WMD 95%CI	P	I <sup>2</sup>
5-year overall survival			
Overall(6)	1.53 (1.23,1.91)	0.0001	87.0
Sensitivity analysis	1.53 (1.23,1.91)		
No progress rate for 5 years			
Overall(4)	1.34 (1.07,1.68)	0.01	0.0
Sensitivity analysis	1.34 (1.07,1.68)		
The total rate of relapse			
Overall(3)	0.62 (0.46,0.84)	0.002	73.0
Sensitivity analysis	0.62 (0.46,0.84)		
Incidence of treatment complications			
Overall(3)	10.26 (7.79,13.51)	<0.00001	0.0
Sensitivity analysis	10.26 (7.79,13.51)		

**Table 2:** Sensitivity analysis.

**Discussion**

Based on the meta-analysis of health informatics, the results showed that the 5-year progression-free rate and 5-year overall survival rate of patients in the radiotherapy combined with chemotherapy group were significantly higher than those in the radiotherapy alone group, and the total recurrence rate of patients in the radiotherapy combined with chemotherapy group was significantly lower than that in the radiotherapy alone group. Wang Yan<sup>(11)</sup> found that compared with the chemotherapy alone group, the postoperative chemotherapy combined with radiotherapy had a higher 5-year overall survival rate. Studies have shown that postoperative adjuvant therapy has an important impact on the overall survival rate and progression-free survival rate of patients with endometrial cancer.

The combination of radiotherapy and chemotherapy as adjuvant therapy can effectively improve the overall survival rate and disease-free survival rate of patients<sup>(12, 13)</sup>. The results of this study are consistent with the above conclusions, indicating that combined chemoradiotherapy can reduce the postoperative recurrence rate of endometrial cancer patients, and effectively improve the 5-year overall survival rate and 5-year progression-free rate.

The reason may be that chemotherapy on the basis of radiotherapy can effectively control local recurrence in patients with endometrial cancer, further solve the problem of remote transmission of the disease, effectively reduce the remote recurrence rate, and thus significantly reduce the risk of recurrence in patients. In addition, the survival rate of patients with endometrial cancer is closely related to the recurrence of patients. When patients are combined with radiotherapy and chemotherapy, the local recurrence of patients can be effectively controlled, the risk of tumor metastasis can be reduced, the overall survival rate of patients will be finally affected, and the survival cycle of patients will be significantly prolonged.

Zhang Mingchuan found that the incidence of adverse reactions in patients with combined chemoradiotherapy was lower than that in the group treated with chemotherapy alone, indicating that combined chemoradiotherapy could significantly reduce the incidence of adverse reactions in patients with endometrial cancer<sup>(14)</sup>. Based on the meta-analysis of health informatics, the results showed that the incidence of post-treatment complications in the radiotherapy combined with chemotherapy group was significantly higher than that in the radiotherapy alone group. Data don't agree with the above research conclusion, this study reason may be that for patients with endometrial carcinoma postoperative adverse reactions, due to less complications of the related research literature research deviation, subsequent postoperative adverse reactions have to be considered as an adjuvant treatment in patients with endometrial cancer effect and security of the key research direction for further exploration.

The innovation of this article is based on health informatics application of Meta analysis, health informatics advantage can obtain higher quality, higher efficiency and more opportunities for new information data, on the basis of the adopted applied the strongest evidence-based medicine (EBM) analysis-Meta method, can satisfy each other will be more independent and objective consistent study

systematic evaluation and quantitative analysis, can improve the reliability of the results. At present, the research on endometrial cancer is still at a controversial stage, and relevant studies on small molecular mechanism, complication prevention and other aspects have achieved great results, laying a research sample foundation for meta-analysis. In addition, in the literature on endometrial cancer, there are few types that consider the efficacy and safety of treatment, and the results of specific relevant experiments are not convincing due to error and chance. When meta-analysis was used, the sample size increased and the heterogeneity among studies decreased. Quantitative analysis of the therapeutic effects of various drugs could make the results more scientific and reliable. The results of this study were tested by  $\text{Chi}^2$ , indicating that heterogeneity existed among all studies. The reason for heterogeneity is that although various studies specify the principle of random selection to select the research target, the specific explanation of the unit shows that the process has the possibility of individual intentionality. In this study, a total of 7 articles were included after screening with reference to specific standards. The collection scope was wanfang database, various Medical Chinese journals and other literatures related to the research direction within 10 years. On the whole, the scope of selection was small, resulting in insufficient included literatures meeting the standards and the possibility of errors affecting the research results.

In addition, the scope of literature retrieval of health informatics engineering should be expanded to ensure that Meta analysis is carried out on the basis of sufficient sample size of medical and health information, and higher quality information data can be obtained through health informatics, so as to improve the reliability of Meta analysis results and make them more convincing.

All in all, Radiotherapy in combination with chemotherapy can obviously reduce postoperative recurrence rate, endometrial cancer patients can prolong the overall survival and progression-free rate at the same time, is worth popularization and application, but the combination therapy may increase the risk of patients with postoperative complications, is a new challenge in the field of health care, is creating a new era in medical areas must overcome one difficulty, should actively learn the new complication protection knowledge and skills, adopt effective protective measures to reduce the incidence of complications and complications for patients life security, create a new era of the radiation and chemotherapy treatment.

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