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Treatment of non-small cell lung cancer with the nursing application of chemotherapy and traditional Chinese medicine: A meta-analysis

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Abstract

Background

The purpose of the study was to appraise and compare the treatment of non-small cell lung cancer with the nursing application of chemotherapy and traditional Chinese medicine.

Method

Based on the inspection of the meta-analysis data, the odds ratio (OR) and mean difference (MD) with 95% confidence intervals (CIs) were derived by dichotomous random or fixed effect models. 26 papers with a total of 2290 subjects who were available between 2005 and 2021 were included in this meta-analysis.

Results

Traditional Chinese medicine had significantly higher quality of life (OR, 2.79; 95% CI, 1.87-4.16, p<0.001) and clinical efficacy (OR, 2.79; 95% CI, 2.24-3.47, p<0.001), and Karnofsky Performance Status score (OR, 3.03; 95% CI, 1.45-6.34, p=0.003), and lower leukopenia (OR, 0.21; 95% CI, 0.12-0.36, p<0.001), thrombocytopenia (OR, 0.19; 95% CI, 0.13-0.29, p<0.001), myelosuppression (OR, 0.24; 95% CI, 0.10-0.58, p=0.001), hemoglobin decrease (OR, 0.34; 95% CI, 0.12-0.93, p=0.04), nausea and vomiting (OR, 0.16; 95% CI, 0.11-0.22, p<0.001), diarrhea (OR, 0.22; 95% CI, 0.13-0.36, p<0.001), liver damage (OR, 0.17; 95% CI, 0.10-0.28, p<0.001), and kidney damage (OR, 0.30; 95% CI, 0.10-0.90, p=0.03) compared to control in subjects with non-small cell lung cancer.

Conclusions

The data that was looked at showed that using traditional Chinese medicine had significantly higher quality of life and clinical efficacy, and Karnofsky Performance Status score, and lower adverse effects, and hematological toxicity compared to control in subjects with non-small cell lung cancer. However, given that most of the studies comprised a small number as sample size, attention ought to be given to their values.

Keywords: adverse effects; quality of life; Clinical efficacy; hematological toxicity; traditional Chinese medicine; non-small cell lung cancer

Introduction

The most frequent disease and the primary cause of cancer-related deaths globally is lung cancer[1]; around 85% of lung cancer cases are non-small cell lung cancer. Non-small cell lung cancer is currently treated primarily with surgery, chemotherapy, radiation therapy, and molecular-targeted therapy. Even though the tumor volume was reduced by those therapies to the best of their ability, the severe toxic side effects of chemotherapy are unavoidable and tough to handle. In addition, the majority of patients had a significant chance of experiencing a recurrence following surgery which was typically deadly due to development of multi-drug resistance.[2, 3]

A growing body of research has demonstrated that traditional Chinese medicine is a promising adjuvant therapy for cancer. Traditional Chinese medicine has a long history of use in cancer treatment in China. Traditional Chinese medicine was generally thought to increase effectiveness while decreasing toxicity. When traditional Chinese medicine is used clinically to treat cancer, it is discovered to have many benefits, particularly in terms of suppressing and eliminating tumor cells, lowering toxic reactions to radiation and chemotherapy, enhancing patient quality of life and immunity, easing clinical symptoms, minimizing side effects from radiation and chemotherapy, and increasing patient survival times. Traditional Chinese medicine has a complex mechanism of action for treating lung cancer that includes several targets, routes, and layers. [4, 5] Traditional Chinese medicine focuses on treating lung cancer with tailored care, body strengthening, and removal of pathogenic causes. In clinical practice, the benefits of traditional Chinese medicine for lung cancer treatment are becoming more and clearer. Regarding the safety and efficacy of traditional Chinese medicine in conjunction with chemotherapy for the treatment of non-small cell lung cancer, there is still debate. To assess the effectiveness of traditional Chinese medicine combined with chemotherapy in patients with non-small cell lung cancer, we performed a meta-analysis to compare the treatment of non-small cell lung cancer with the nursing application of chemotherapy and traditional Chinese medicine.

Method

Design of the examination

The meta-analyses were estimated and combined with the epidemiological statement using a predefined procedure. Several databases, including the Cochrane Library, PubMed, OVID, Google Scholar, and Embase, were accessed in gathering and analyzing the data. These datasets were applied to collect analyses that compared and assessed the treatment of non-small cell lung cancer with nursing application of chemotherapy and traditional Chinese medicine.[6]

Data pooling

It was discovered that traditional Chinese medicines in non-small cell lung cancer produced several clinical results. In this research, the main consequence of the inclusion parameter was analyzed. Language obstacles were not taken into account during the inclusion of research or the screening process for potential participants. There were no restrictions on the quantity of volunteers that could be found for the research. Since letters, reviews, and editorials do not present a position in the meta-analysis, we did not integrate this kind into our creation. Figure 1 illustrates the complete inspection identification process.

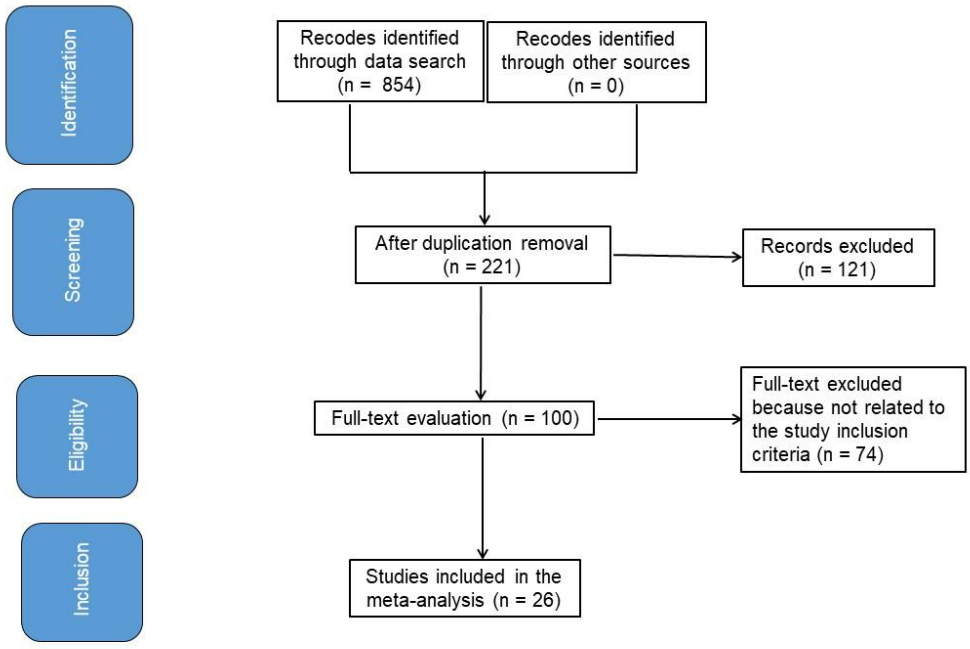

Figure 1. Schematic diagram of the examination procedure

Eligibility of included studies

The treatment of non-small cell lung cancer with nursing application of chemotherapy and traditional Chinese medicine was being studied. Only examinations that talked about how interferences influenced the incidence of different clinical results were included in the sensitivity analysis. Subclass and sensitivity analyses were implemented by associating the numerous subtypes with the interference groups.

Inclusion and exclusion criteria

Inclusion criteria and exclusion criteria:

Figure 1 is an overall study representation. When the inclusion criteria were satisfied, the literature was incorporated into the study:

1. The research was a randomized controlled study, observational, retrospective, and prospective.
2. Subjects with non-small cell lung cancer were the investigated elect subjects.
3. The interference incorporated traditional Chinese medicines.
4. The study examines the treatment of non-small cell lung cancer with the nursing application of chemotherapy and traditional Chinese medicine.

The exclusion of non-comparative study designs occurred.

Identification of studies

A protocol of search algorithms was established and specified by the PICOS principle, [7] which states: P (population) Subjects with non-small cell lung cancer; Traditional Chinese medicine was the "interference" or "exposure"; C (comparison): the comparison between traditional Chinese medicine and control. O (outcome): different clinical results; S (design of the examination): the planned valuation was unlimited. [8] By the keywords in Table 1, we led a thorough exploration of the applicable databases through May 2025. Appraisals were led on the entire articles encompassed in a reference management program, comprising Author, titles, and abstracts. Moreover, two authors assess publications to detect appropriate tests.

Table 1. Database Search Strategy for inclusion of examinations

Database	Search strategy
Google Scholar	#1 "adverse effects" OR "quality of life" #2 "hematological toxicity" OR "traditional Chinese medicine" OR " "clinical efficacy" OR "non-small cell lung cancer" #3 #1 AND #2
Embase	#1 'adverse effects' /exp OR 'quality of life' /exp OR 'clinical efficacy' #2 'hematological toxicity'/exp OR 'traditional Chinese medicine'/exp OR 'non-small cell lung cancer' #3 #1 AND #2
Cochrane library	#1 (adverse effects):ti,ab,kw (quality of life):ti,ab,kw (clinical efficacy):ti,ab,kw (Word variations have been searched) #2 (hematological toxicity):ti,ab,kw OR (traditional Chinese medicine):ti,ab,kw OR(non-small cell lung cancer):ti,ab,kw (Word variations have been searched) #3 #1 AND #2
Pubmed	#1 "adverse effects"[MeSH] OR "quality of life"[MeSH] OR "clinical efficacy" [All Fields] #2 "hematological toxicity"[MeSH Terms] OR "traditional Chinese medicine"[MeSH] OR "non-small cell lung cancer "[All Fields] #3 #1 AND #2
OVID	#1 "adverse effects"[All Fields] OR "quality of life" [All Fields] OR "clinical efficacy" [All Fields] #2 "hematological toxicity"[All fields] OR "traditional Chinese medicine"[All Fields] or "non-small cell lung cancer"[All Fields] #3 #1 AND #2

Screening of studies

The investigation is given in a regular format, along with each of its component features. First author's last name, the study's date, the nation in which it was taking place, femininity, type of population that was employed for meta-analysis, total number of subjects, clinical and treatment characteristics, demographic information, and qualitative and quantitative evaluation methods were some criteria applied to decrease the data. [9] Two authors looked into the opportunity of bias in the studies and the standard of approaches utilized in papers elected for supplementary analysis. The two authors conducted unbiased reviews of techniques used for each test. [10]

Statistical analysis

In this meta-analysis, the odds ratio (OR) and mean difference (MD) with a 95% confidence interval (CI) were estimated utilizing dichotomous random- or fixed-effect models. [7] Calculated I2 index has a range of 0 to 100 and is expressed as a percentage. [9] Higher I2 values signify increased heterogeneity, whilst lower I2 values signify decreased heterogeneity. If I2 was 50% or above, the random effect was selected; otherwise, a fixed effect was chosen. [11] The First study's consequences were classified as a component of the subcategory analysis. Bias was measured using Begg's and Egger's tests utilized for quantitative analysis, and it was considered to exist if $p > 0.05$. [12, 13] p-values were calculated by a two-tailed approach. With Review Manager 5.4, graphs and statistical analyses were created.

Results

After examining 854 pertinent publications, 26 research that were published between 2005 and 2021 content the requirements and were encompassed in this study. [14-39]

Table 2 condenses the discoveries of these studies. 2290 persons were studied.

Traditional Chinese medicine had significantly higher quality of life (OR, 2.79; 95% CI, 1.87-4.16, $p<0.001$) with low heterogeneity ($I^2=42\%$) and clinical efficacy (OR, 2.79; 95% CI, 2.24-3.47, $p<0.001$) with no heterogeneity ($I^2=0\%$), and Karnofsky Performance Status score (OR, 3.03; 95% CI, 1.45-6.34, $p=0.003$) with moderate heterogeneity ($I^2=54\%$), and lower leukopenia (OR, 0.21; 95% CI, 0.12-0.36, $p<0.001$) with moderate heterogeneity ($I^2=64\%$), thrombocytopenia (OR, 0.19; 95% CI, 0.13-0.29, $p<0.001$) with low heterogeneity ($I^2=33\%$), myelosuppression (OR, 0.24; 95% CI, 0.10-0.58, $p=0.001$) with moderate heterogeneity ($I^2=62\%$), hemoglobin decrease (OR, 0.34; 95% CI, 0.12-0.93, $p=0.04$) with high heterogeneity ($I^2=75\%$), nausea and vomiting (OR, 0.16; 95% CI, 0.11-0.22, $p<0.001$) with low heterogeneity ($I^2=34\%$), diarrhea (OR, 0.22; 95% CI, 0.13-0.36, $p<0.001$) with no heterogeneity ($I^2=0\%$), liver damage (OR, 0.17; 95% CI, 0.10-0.28, $p<0.001$) with moderate heterogeneity ($I^2=58\%$), and kidney damage (OR, 0.30; 95% CI, 0.10-0.90, $p=0.03$) with no heterogeneity ($I^2=0\%$) compared to control in subjects with non-small cell lung cancer, as shown in Figures 2-12.

The quantitative Egger regression test and the visual interpretation of the effect's forest plot revealed no indication of investigation bias ($p=0.89$). It was exposed that the mainstream of pertinent exams had poor practical quality and were prejudiced in their selective reporting.

Table 2. Characteristics of studies

Study	Country	Total	Traditional Chinese medicine	Control
Xiaoxia, 2005 [14]	China	45	25	20
Chen, 2009 [15]	China	61	33	28
Yan-zhi, 2009 [16]	China	61	33	28
Xu, 2011 [17]	China	116	63	53
Yanli, 2011 [18]	China	57	29	28
Hui, 2012 [19]	China	68	36	32
Dengxiang, 2012 [20]	China	173	89	84
Yanli, 2012 [21]	China	57	28	29
Liu, 2016 [22]	China	60	30	30
Wang, 2016 [23]	China	106	53	53
Zhi, 2016 [24]	China	80	40	40
Jiao, 2017 [25]	China	229	107	122
Qingchun, 2017 [26]	China	72	36	36
Xu, 2017 [27]	China	106	53	53
Chengjie, 2017 [28]	China	60	30	30
Hua, 2017 [29]	China	91	46	45
Wei, 2017 [30]	China	140	70	70
Wang, 2018 [31]	China	53	31	22
Tao, 2018 [32]	China	80	40	40
Xianzhong, 2019 [33]	China	70	35	35
Zhongqing, 2019 [34]	China	72	36	36
Li, 2019 [35]	China	86	43	43
Xiaoying, 2019 [36]	China	76	38	38
Gu, 2019 [37]	China	108	54	54
Wang, 2021 [38]	China	91	61	30
Xiao, 2021 [39]	China	72	36	36
	Total	**2290**	**1175**	**1115**

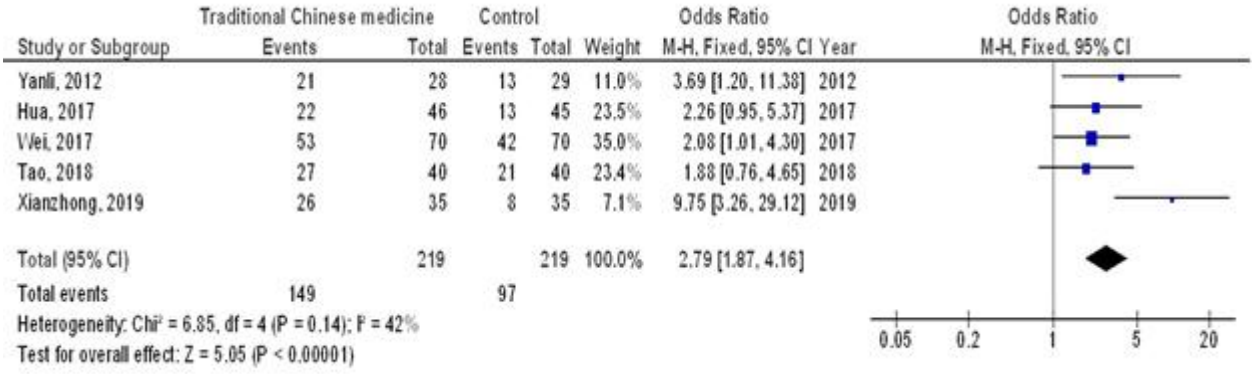

Figure 2. The effect's of the forest plot of the traditional Chinese medicine on quality of life compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

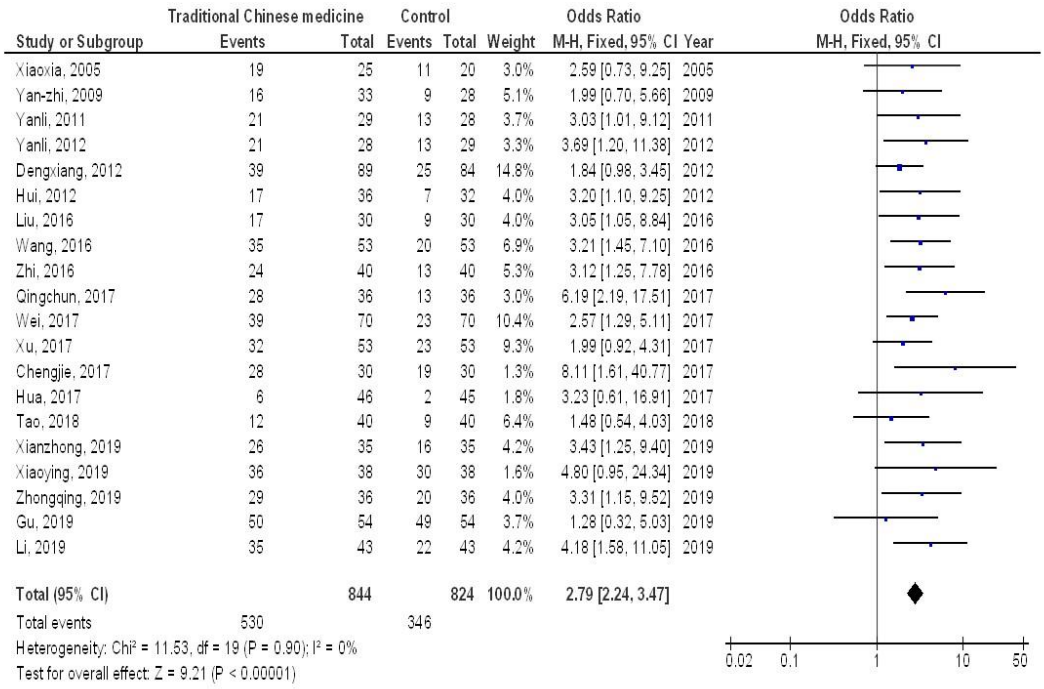

Figure 3. The effect's the forest plot of traditional Chinese medicine on Clinical efficacy compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

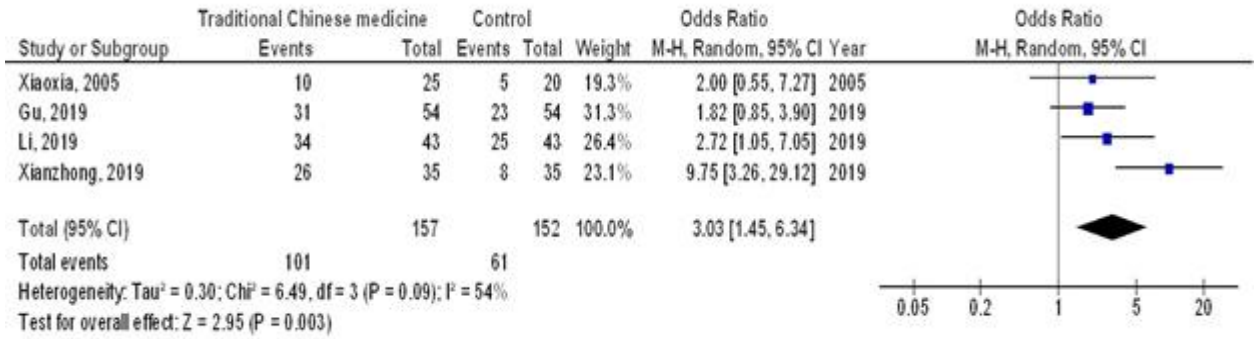

Figure 4. The effect's the forest plot of traditional Chinese medicine on Karnofsky Performance Status score compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

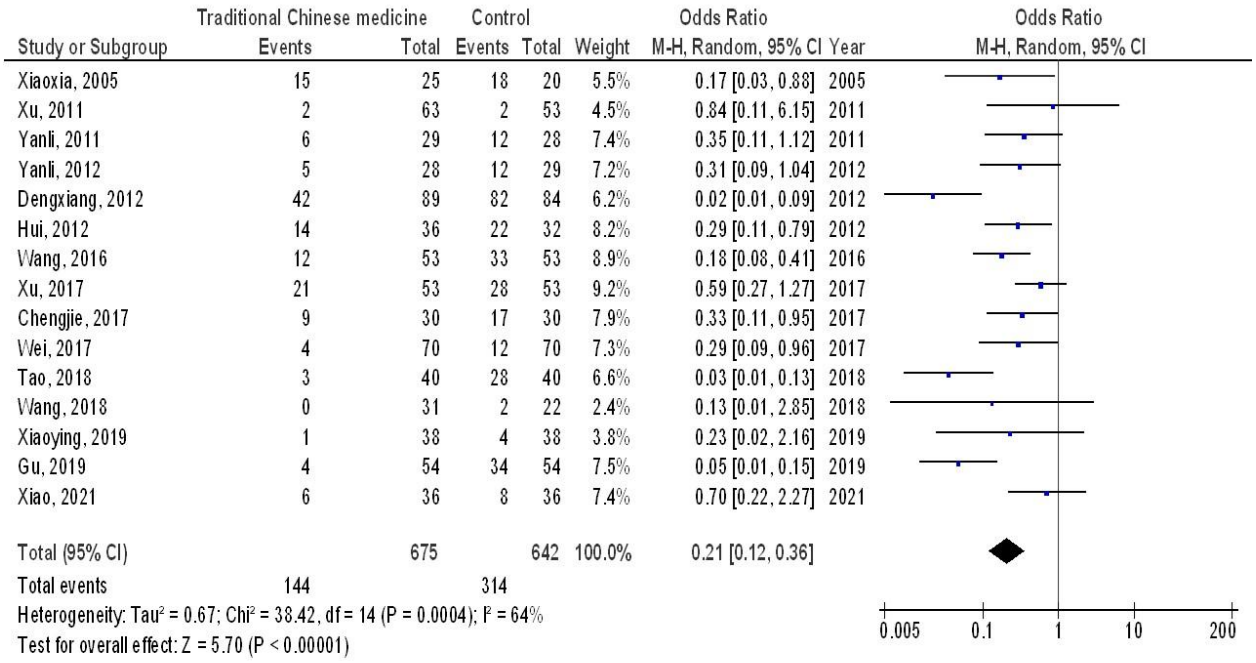

Figure 5. The effect's the forest plot of traditional Chinese medicine on leukopenia compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

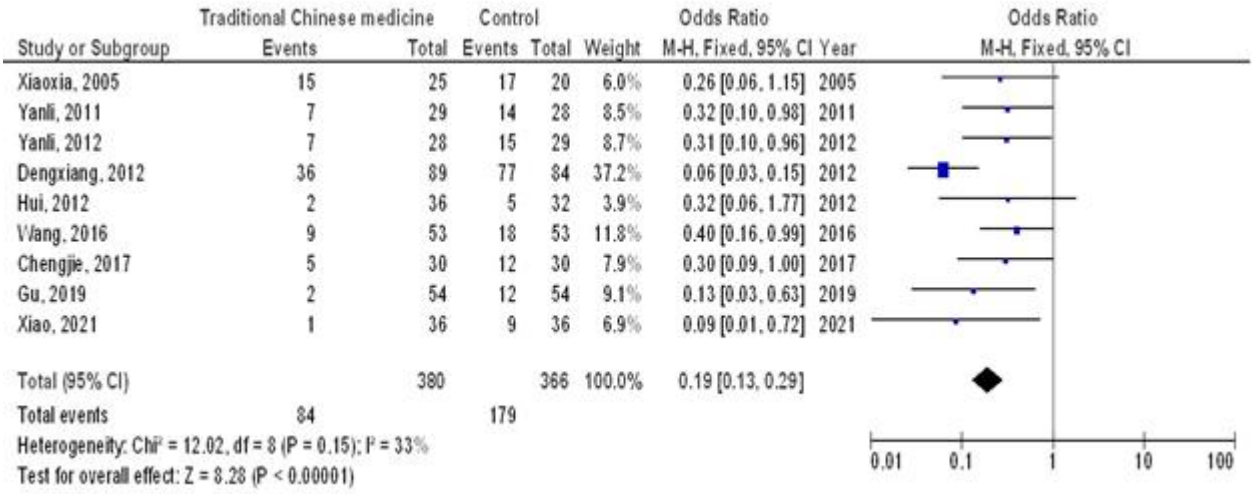

Figure 6. The effect's the forest plot of traditional Chinese medicine on thrombocytopenia compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

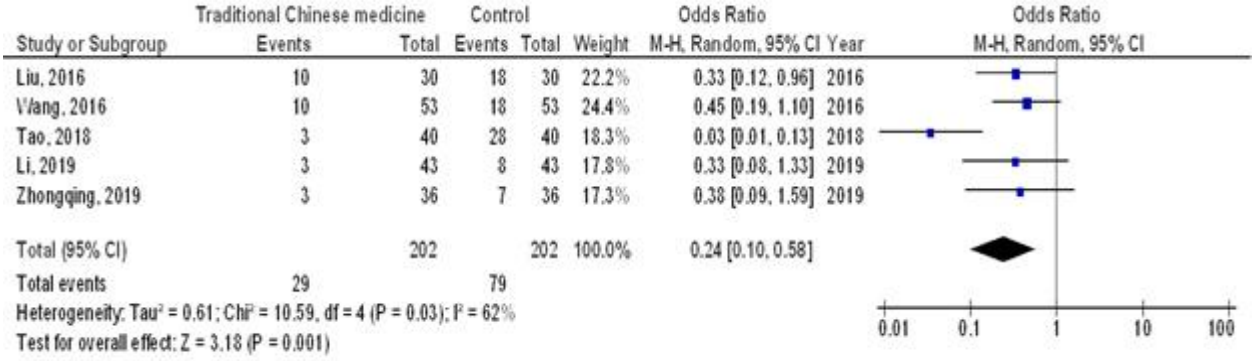

Figure 7. The effect's the forest plot of traditional Chinese medicine on myelosuppression score compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

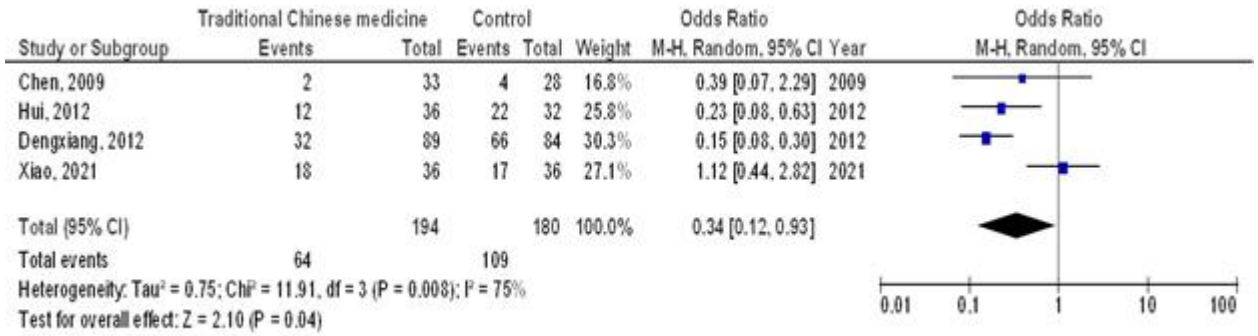

Figure 8. The effect of the forest plot of the traditional Chinese medicine on hemoglobin decrease compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

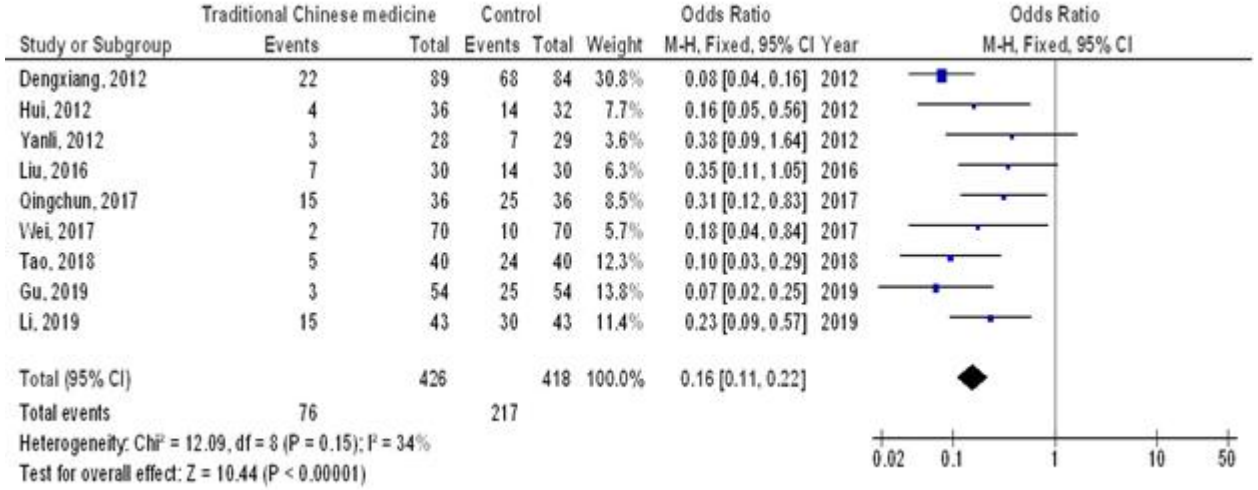

Figure 9. The effect's the forest plot of traditional Chinese medicine on nausea and vomiting compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

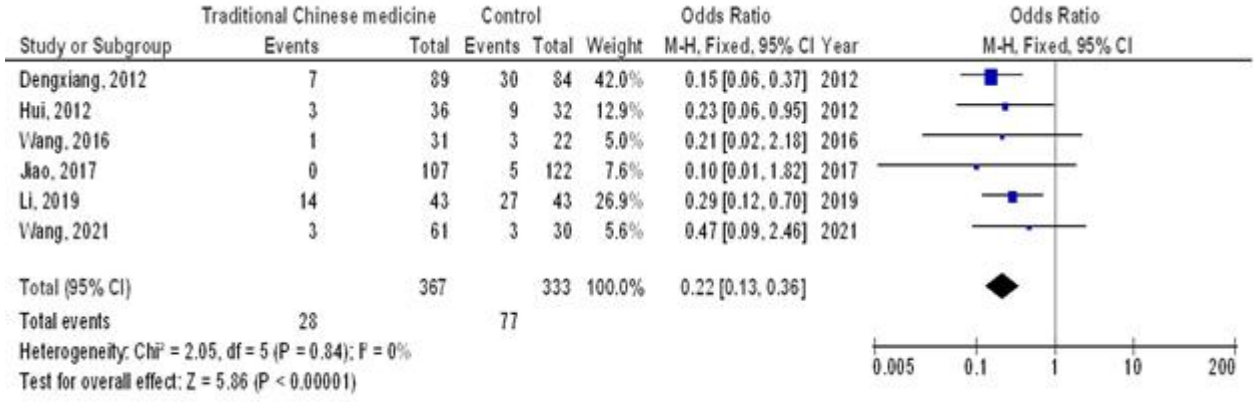

Figure 10. The effect's the forest plot of traditional Chinese medicine on diarrhea score compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

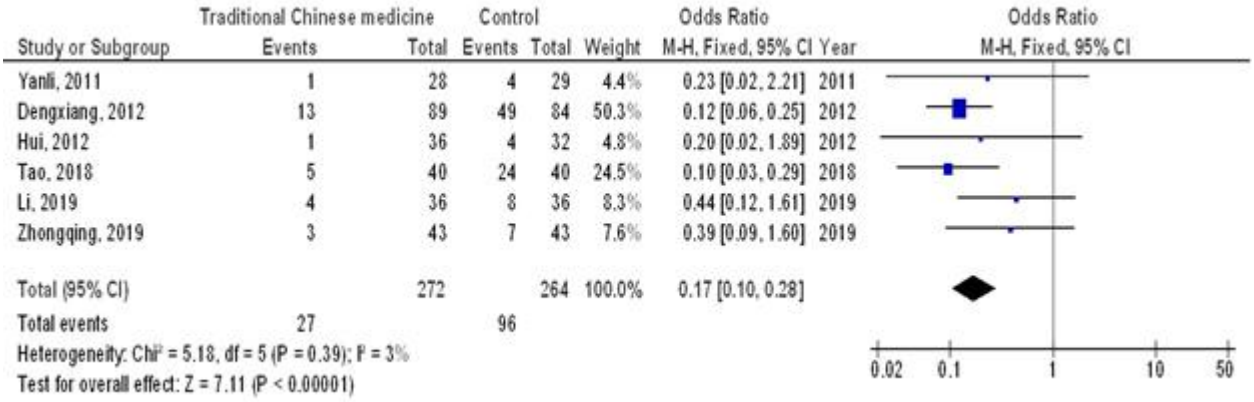

Figure 11. The effect's the forest plot of traditional Chinese medicine on liver damage compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

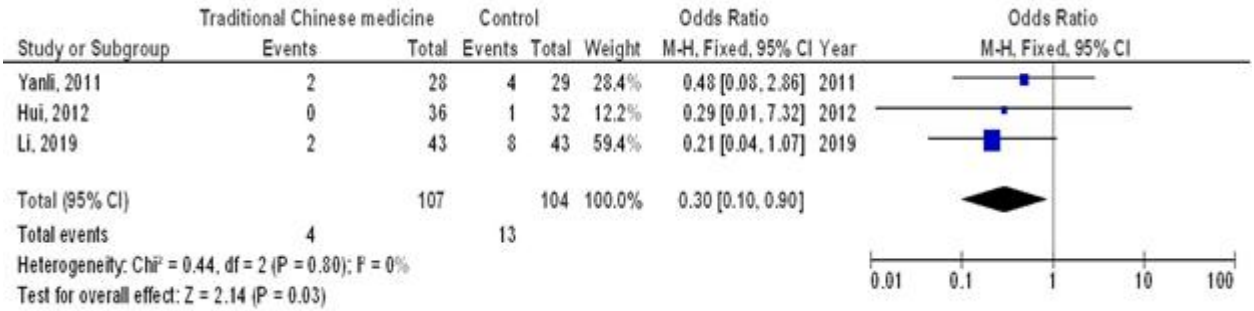

Figure 12. The effect's the forest plot of traditional Chinese medicine on kidney damage score compared to control in subjects with non-small cell lung cancer with non-small cell lung cancer.

Discussion

For the current meta-analysis, 26 research that were published between 2005 and 2021 were included; of these, 2290 people were studied. [14-39]

The data that was looked at showed that using traditional Chinese medicine had significantly higher quality of life and clinical efficacy, and Karnofsky Performance Status score, and lower leukopenia, thrombocytopenia, myelosuppression, hemoglobin decrease, nausea and vomiting, diarrhea, liver damage, and kidney damage compared to control in subjects with non-small cell lung cancer However, given that most of the studies comprised a minor sample size (18 studies utilizing sample sizes lower than 100 subjects), thoughtfulness ought to be prearranged to their values.

At 11.6% of all instances, lung cancer is currently the most prevalent disease to be diagnosed. It is also the primary cause of cancer-related deaths globally, with non-small cell lung cancer making up over 85% of cases. The incidence of non-small cell lung cancer in China has risen sharply in the past several years, posing a serious threat to public health. [40-42] Due to its gradual onset, the majority of symptoms appear later and are not immediately apparent, and the prognosis is not good. Currently, the most essential treatment modalities that have produced some results include chemotherapy, targeted therapy, and radiation. Nevertheless, the overall result is still not optimal, and novel treatment approaches must be investigated immediately to raise the effectiveness. Even though traditional medicine has developed a unique diagnostic approach and a systematic theoretical framework, there is still a great deal of uncertainty surrounding clinical treatment due to the lack of clarity surrounding the assessment of the clinical curative effect, which is primarily based on the patient's subjective symptoms and signs. However, traditional Chinese medicine treatment in conjunction with Western anti-tumor medications not only offers a foundation for using traditional Chinese medicine to treat tumors but also amplifies the anti-tumor medications' curative effects. [43] A certain theoretical foundation for the application of traditional Chinese medicine in cancer treatment is provided by the increasing number of research that center on the survival of cancer with tumors.

According to traditional Chinese medicine theory, traditional Chinese medicine is used to promote healthy quality improvement, enhance patients' bodily functions, and prevent tumor growth to increase survival rates and lengthen survival times. Current network pharmacological studies have demonstrated that traditional Chinese medicine's anti-tumor effects are based on a holistic perspective and act as multiple targets. These include enhancing the immune system, reducing the growth of cancer cells, causing cancer cells to undergo apoptosis, preventing tumor angiogenesis, modifying tumor cell signaling pathways, and reversing multi-drug resistance, among other effects. Traditional Chinese medicine added to chemotherapy could statistically significantly reduce severe toxicity as compared to chemotherapy administered alone. Strong evidence is found in the analysis to support the use of traditional Chinese medicine to lessen toxicity and improve the healing effects of Western medicine treatments alone. However, there are still many unanswered questions about traditional Chinese medicine, like what exactly makes it successful and whether or not these herbal components interact with medications. These questions currently lack definitive solutions, thus more thorough research is required.

Among the meta-analysis's limitations were the following: Assortment bias could have arisen because certain papers that were to be included in the study were excluded. Nevertheless, all the excluded work didn't meet the necessary criteria to be included in the study. Still, the data was needed to determine whether influences e.g. ethnicity, age, and gender influenced the consequence. The impartial of the study was to define the treatment of non-small cell lung cancer with the nursing application of chemotherapy and traditional Chinese medicine. Using imprecise or inadequate data from a preceding study most likely made the bias worse. The person's age, gender, ethnicity, and nutritional state were the main variables that most likely contributed to discrimination. Values may unintentionally be modified as a result of unreported investigations and inadequate data.

Conclusions

The data that was looked at showed that using traditional Chinese medicine had significantly higher quality of life and clinical efficacy, and Karnofsky Performance Status score, and lower leukopenia, thrombocytopenia, myelosuppression, hemoglobin decrease, nausea and vomiting, diarrhea, liver damage, and kidney damage compared to control in subjects with non-small cell lung cancer However, given that most of the studies comprised a minor sample size (18 studies utilizing sample sizes lower than 100 subjects), thoughtfulness ought to be prearranged to their values.

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