Review Article

Comparison Efficacy and Safety of Gemcitabine plus Cisplatin and 5-Fluorouracil plus Cisplatin for Metastatic Nasopharyngeal Carcinoma: A Meta-Analysis and Systematic Review

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Objective. To compare the efficacy and safety of gemcitabine plus cisplatin (GP) and 5-fluorouracil plus cisplatin (PF) for metastatic nasopharyngeal carcinoma. Methods. The clinical trials of GP and PF in the treatment of metastatic nasopharyngeal carcinoma (NPC) were searched in PubMed, EMBASE, Cochrane Library, and Web of Science. The literature search met the inclusion and exclusion criteria. The software Revman 5.4 was used for data analysis, and STATA 15.0 was used for publication bias.

Results. 10 studies were included in this meta-analysis. The results showed that the GP group had a higher clinical remission rate than the PF group (RR = 1.22, 95% CI (1.03–1.44), P = 0.02). GP and PF groups in OS, PFS, and DMFS had the same effect at 1, 2, and 3 years (OS at 1 year: RR = 1.04, 95% CI (0.95–1.15), P = 0.37; 2 years: RR = 1.08, 95% CI (0.94 1.23), P = 0.28; 3 years: RR = 1.07, 95% CI (0.89 1.29), P = 0.46; PFS at 1 year: RR = 1.98, 95% CI (0.29 13.44), P = 0.49; 2 years: RR = 3.09, 95% CI (0.10 97.55), P = 0.52; 3 years: RR = 0.95, 95% CI (0.73 1.24), P = 0.71; DMFS at 1 year: RR = 1.01, 95% CI (0.90–1.14), P = 0.83; 3 years: RR = 1.10, 95% CI (0.85–1.41), P = 0.47. The number of hematological adverse reactions occurred in GP group was higher than the PF group. Conclusion. The GP and PF groups had similar OS, PFS, and DMFS, but the GP group had a higher clinical remission rate. Therefore, GP may be the first choice for metastatic NPC.

1. Introduction

Nasopharyngeal carcinoma (NPC) is a malignant tumor that occurs in the roof and side walls of the nasopharyngeal cavity, and the incidence rate is the first among otorhinolaryngology malignant tumors. Common clinical symptoms are nasal congestion, blood in the snot, ear stuffiness, hearing loss, diplopia, and headache. In Europe and the US, the incidence of NPC is low [1]. But it is more likely to occur in Guangdong, Guangxi, Fujian, Hunan, and other regions of China [2]. According to the regional cancer registry for China in 2014, the incidence of NPC was approximately 3.26 per 100,000 and the mortality rate was 1.77/100,000 [3]. The special anatomical structure of the pharyngeal crypt is a common site of nasopharyngeal cancer, which often impedes surgery and responds well to radiotherapy, making it the preferred treatment for NPC. The local control rates can reach over 90%. However, the main cause of treatment failure is a local recurrence and distance [4]. Studies have found that distant metastasis of NPC accounts for 60% to 70%, nasopharyngeal recurrence rate accounts for 20% to 22%, and regional lymph node recurrence rate accounts for 14% to 18% [5, 6]. Whenever these distant metastasis or recurrence occur, patients’ survival rates are significantly
affected. Therefore, how to choose the treatment plan for NPC patients has become a hot topic of discussion [7].

The treatment of metastatic NPC is usually combined with chemotherapy and radiotherapy [8]. Gemcitabine is a deoxycytidine analog that inhibits DNA synthesis and demonstrates broad-spectrum antitumor activity. After the drug enters cells, gemcitabine triphosphate is produced. A large amount of gemcitabine triphosphate is embedded into DNA through competition that inhibits DNA polymerase and leads to the breakage of DNA strands, toxic to tumor cells, and causes them to die [9–11]. When combined with cisplatin, these two drugs have a synergistic effect that reduces the activity of head and neck tumors. In addition, gemcitabine can prevent RNA synthesis, which reasonably explains its cytotoxicity [12]. Relevant studies and systematic reviews have also confirmed the efficacy of gemcitabine in other malignant tumors [13, 14]. As is known to all, the PF is one of the primary options for the treatment of metastatic NPC [15]. There has been controversy over the clinical choice between GP or PF for metastatic NPC [16, 17]. Therefore, this study hopes to solve this dispute through systematic evaluation and meta-analysis of these two treatment schemes and to provide a reference for patients with nasopharyngeal carcinoma and clinicians to make a better decision.

2. Materials and Methods

2.1. Inclusion and Exclusion Criteria

2.1.1. Inclusion Criteria. NPC patients with distant metastases—one group treated with GP and the other with PF; clinical efficacy as primary outcomes; overall survival (OS); progression-free survival (PFS); distance metastasis-free survival (DMFS); side effects as secondary outcomes; the included studies were randomized controlled trials.

2.1.2. Exclusion Criteria. Conference abstract, systematic review, case report, animal experiment, repeatedly published articles, articles whose full text cannot be obtained, and data are unavailable.

2.2. Literature Search. Clinical trials on the treatment for metastatic NPC with GP and PF were searched in PubMed, Embase, Cochrane library, Web of Science, etc. Subject words plus free words were entered. For example, the terms that were typed when searching database PubMed were Nasopharyngeal Carcinoma [mesh]; Carcinoma, Nasopharyngeal [Title/Abstract]; Nasopharyngeal Carcinomas [Title/Abstract]; gemcitabine [mesh]; Gemzar [Title/Abstract]; Fluorouracil [mesh]; 5 Fluorouracil [Title/Abstract]; Fluracendyl [Title/Abstract], etc. No restrictions on retrieval time and publication status were imposed, and PubMed’s search strategy is described in Supplement 1.

2.3. Data Extraction. Two reviewers (Le Yan and Hanxue Zheng) independently conducted research screening and data extraction. Disagreements were settled via consulting a third reviewer. When selecting an article, first delete duplicate articles, then exclude irrelevant articles, and evaluate the eligibility of the full article.

The data to be extracted include author; publication date; sample size; age; chemotherapy dose; follow-up; and outcome.

2.4. Quality Evaluation of Included Articles. The methodological quality of the included RCTs was assessed according to the quality assessment criteria in Cochrane Handbook for Systematic Reviewers 5.4.0, which method of randomization was used, whether allocation concealment was used, whether the evaluation was blinded, whether there was data bias, and whether there was selection bias. Results and other deviations are reported. The evaluation results for each item were expressed as “yes” (low risk of bias), “unclear,” and “no” (high risk of bias).

2.5. Statistical Analysis. The extracted data were entered into Review Manager 5.4 (Cochrane, London, UK) provided by the Cochrane Collaboration software for statistical analysis. For dichotomous data, the merge is estimated as the relative risk ratio (RR, risk ratio) and 95% CI. Gemcitabine combined with cisplatin was compared with 5-fluorouracil combined with cisplatin. Cochran’s Q test and I2 statistics were used to assess the heterogeneity of studies. If $I^2 \geq 50\%$ or $P < 0.05$, the heterogeneity is large, and the random effect model is selected for data merging. Otherwise, the fixed effect model is used for data integration. Potential publication bias was evaluated by funnel plot and Egger’s test. If $P > 0.05$, the risk of publication bias was small; otherwise, there might be certain publication bias. Sensitivity analysis was conducted to evaluate the robustness of the results.

3. Results

3.1. Study Selection Flowchart. A total of 211 articles were obtained through the initial literature search, and 131 remained after articles of duplicate publications were excluded. Following the process of title and abstract screening, 10 eligible articles met the needs and were further analyzed. Literature retrieval flow charts are illustrated in Figure 1.

3.2. Baseline Table and Quality Assessment. A total of 10 RCTs were included. They involved 1651 patients with metastatic NPC, among which 845 patients were treated by GP and 806 patients were treated by PF. The dosage of gemcitabine was 100 mg to 1250 mg, and the dosage of fluorouracil is 500 mg to 2500 mg. The baseline of included studies is in Table 1. The risk of bias is in Figure 2.

3.3. Results of Meta-Analysis

3.3.1. Meta-Analysis of Clinical Remission Rate. A total of 6 studies [16,18,22–25] evaluated the clinical remission rate, involving 876 patients. The heterogeneity test was performed ($I^2 = 79\%, P = 0.002$). The random-effects model was used. The results of the analysis showed that the clinical remission rate in
Records identified through database searching (n=211)

Records removed before screening:
Duplicate records removed (n =80)

Records excluded after reading the title and abstract (n =113)

Exclude records(n=8)
- Did not report the outcomes of interest (n=4)
- The full text is not available(n=2)
- No available data(n=2)

Full-text articles evaluated for eligibility (n=18)

Studies included in quantitative synthesis (Meta-analysis) (n =10)

Identification
Screening
Included

Figure 1: Literature retrieval flow chart.

| Study          | Sample size (male) | Age (year) | Interventions                     | Follow-up (Y) | Outcomes |
|----------------|--------------------|------------|-----------------------------------|---------------|----------|
| ZW Cai, 2009  | 29 (17) 32 (20)    | 23–60 20–63| G:1000 mg/(m²/d); P: 25 mg/(m²/d) | 3             | F1; F2; F3 |
| SK Chan, 2021 | 84 (67) 94 (66)    | 26–75 26–69| G:1000 mg/(m²/d); P: 100 mg/(m²/d)| 12            | F2; F3; F4; F5; F6 |
| MF Gu, 2013   | 80 (62) 80 (63)    | 16–60      | G:800 mg/(m²/d); P: 20 mg/(m²/d)  | 4             | F2; F3; F5; F7 |
| Y Jin, 2012   | 173 (141) 176 (150)| 18–70      | G:1000 mg/(m²/d); P: 80 mg/(m²/d) | 5             | F1; F2; F3 |
| XY Kong, 2019 | 38 (26) 38 (29)    | 24–69      | G:1000 mg/(m²/d); P: 75 mg/(m²/d) | 4             | F1; F2; F3; F5; F6 |
| QH Mo, 2010   | 27 28             | 13–71      | G:1000 mg/(m²/d); P: 25 mg/(m²/d) | 2M            | F1; F2    |
| MY Wu, 2020   | 144 (114) 91 (61)  | 48.8 52.4  | G:1000 mg/(m²/d); P: 25 mg/(m²/d) | 5             | F1; F2; F3; F5; F6 |
| Q Yang, 2022  | 55 (30) 45 (27)    | 18–64      | G:1000 mg/(m²/d); P: 80 mg/(m²/d) | 1             | F1; F2; F3; F8 |
| TK Yau, 2006  | 34 (29) 41 (36)    | 49.4 50.3  | G:1250 mg/(m²/d); P: 80 mg/(m²/d) | 8             | F1; F2; F3; F4; F6; F7 |
| L Zhang, 2016 | 181 181 (141) 153 | 39–55 41–55| G:1000 mg/(m²/d); P: 80 mg/(m²/d) | 4             | F2; F3; F4   |

PF: cisplatin plus fluorouracil; GP: gemcitabine plus cisplatin; F1: clinical efficacy; F2: adverse reaction; F3: OS (overall survival); F4: PFS (progression-free survival); F5: DMFS (distant metastasis-free survival); F6: locoregional recurrence-free survival; F7: DFS (distant free survival); F8: QOL (quality of life).
the GP group was higher than that in the PF group (RR = 1.22, 95% CI (1.03–1.44), p = 0.02, p = 0.02) (see Figure 3).

3.3.2. Meta-Analysis of OS. A total of 9 studies [16–21,23–25] evaluated OS, involving 1596 patients with metastatic NPC. They were divided into subgroups based on follow-up years. The OS rate was evaluated in terms of follow-up time, respectively: 1-, 2-, 3-, and 5-year follow-up. Heterogeneity test was performed (I² = 55%, P = 0.0002). The results showed that the OS results of GP group and PF group at 1, 2, and 3 years of follow-up were similar (1 year: RR = 1.04, 95% CI (0.95–1.15), P = 0.37; 2 years: RR = 1.08, 95% CI (0.94–1.23), P = 0.28; 3 years: RR = 1.07, 95% CI (0.89–1.29), P = 0.46, P = 0.46), while the 5-year OS in the GP group was significantly lower than that in the PF group (RR = 0.88, 95% CI (0.79–0.97), P = 0.01, P = 0.01) (see Figure 4).

3.3.3. Meta-Analysis of PFS. Three literature studies [17,19,25] evaluated PFS, involving 615 patients. Divide them into different subgroups based on follow-up time, and the PFS
in terms of 1-, 2-, and 3-year follow-up was, respectively, evaluated. Heterogeneity test was performed ($I^2 = 78\%$, $P = 0.0001$). The results showed that the PFS results of GP group and PF group were similar at 1, 2 and 3 years (1 year: RR: 1.98, 95% CI: 0.29–13.44; 2 years: RR: 3.09, 95% CI: 0.10–97.55; 3 years: RR: 0.95, 95% CI: 0.73–1.24) (see Figure 5).

3.3.4. Meta-Analysis of DMFS. Four articles [19–21,23] evaluated DMFS, involving 649 patients. They were divided into subgroups according to follow-up time, and DMFS in terms of 1-, 3-, and 5-year follow-up was, respectively, evaluated. Heterogeneity test was performed ($I^2 = 74\%$, $P = 0.007$). The results showed that the DMFS results of GP group and PF group were similar in terms of 1-, 2-, and 3-year follow-up between GP group and PF group (1 year: RR = 1.01, 95% CI (0.90–1.14), $P = 0.83$; 3 years: RR = 1.10, 95% CI (0.85–1.41), $P = 0.47$), while the 5-year DMFS in GP group was significantly lower than PF group (RR = 0.89, 95% CI (0.81–0.97), $P = 0.01$, $P = 0.01$) (see Figure 6).

3.3.5. Meta-Analysis of Side Effects. Nine articles [16–19,21–25] assessed side effects, involving 1249 patients. Side effects are divided into hematological reactions and gastrointestinal reactions. The heterogeneity test ($I^2 = 74\%$, $p < 0.001$) showed that the incidence of hematological side effects in the GP group was higher (RR:1.88, 95% CI:1.26–2.82, $P = 0.002$) than the PF group. Gastrointestinal side effects were similar between the GP and PF groups (RR: 0.92, 95% CI: 0.73–1.17, $P = 0.51$) (see Figure 7).

3.4. Sensitivity and Publication Bias Analysis. Relevant literature studies were deleted one by one, and sensitivity analysis of clinical remission and adverse reactions was performed. The analysis results show that the comprehensive effect size after excluding the literature one by one is still within the boundary, indicating that the analysis results are stable (see Figures 8(a) and 8(b)). Subsequently, Egger’s test was used to analyze publication bias. The $p$ value of the clinical response rate was $p = 0.021$, indicating a high possibility of publication bias. In terms of side effects, $p, p = 0.062$, indicating less potential for publication bias (see Figures 8(c) and 8(d)).

4. Discussion

This meta-analysis included 10 RCT studies, evaluating the efficacy of GP and PF in metastasis NPC patients and security. This study showed that the GP group and PF group had similar effects in OS, PFS, and DMFS. However, more grade 3-4 hematologic side effects were observed in the GP group, and there is no significant difference in gastrointestinal reactions. These results suggest that GP has similar efficacy and safety as PF in treating patients with metastasis NPC.

This study showed that the clinical response rate of patients treated with GP was better than that of PF (RR = 1.22, 95% CI (1.03–1.44), $P = 0.02$, $P = 0.02$), which is consistent with other clinical trials. Ngan [26] found that the cure rate of GP is as high as 73%. Wang’s [27] study found gemcitabine and platinum in the treatment of nasopharyngeal carcinoma, and the total effective rate was 42.7%. The possible mechanism was that, after gemcitabine was dripped, the drug was incorporated into radiation-resistant S-phase cells, resulting in cell death. When used with platinum, it can facilitate crosslinking of DNA, thus inhibiting DNA replication and RNA transcription and promoting apoptosis. After the first-line chemotherapy that is followed by radiotherapy, the tumor microenvironment changes, translating hypoxic cells to oxygen-rich cells to improve the radiation response of nasopharyngeal carcinoma cells, produce sensitization, and achieve a high remission rate [28,29].

In this study, the results of total OS, PFS, and DMFS were similar between the two groups, which is consistent with the conclusion drawn by Tan et al. [30] that chemotherapy with gemcitabine, carboplatin, and paclitaxel did not improve OS and DFS in patients. The reasons may be as follows: (1) induction chemotherapy with GP had no effect, or this study lacks the ability to detect significant differences in survival. (2) low-dose carboplatin impaired the desired synergy achieved by the combination of it and gemcitabine [31]. However, when performing subgroup analyses, the survival rate of OS and DMFS in the five-year
follow-up subgroup, the effect of PF was better than that of GP (RR = 0.88, 95% CI (0.79–0.97), \( P = 0.01 \); RR = 0.89, 95% CI (0.81–0.97), \( P = 0.01 \), \( P = 0.01 \)), but it is far from convincing due to the small size of samples as too few studies were included in the fifth year. The study also found that there is a greater incidence of side effects in the GP group than that in the PF group (RR = 1.88, 95CI (1.26–2.82), \( P = 0.002 \), \( P = 0.002 \)), among which the incidence of myelosuppression, neutropenia, and thrombocytopenia was relatively high. This may be related to the decrease in bone marrow hematopoietic function in patients after multiple radiotherapy and chemotherapy, and it is also consistent with the characteristics of severe hematologic toxicity in patients receiving chemotherapy with gemcitabine. However, most of the patients improved after symptomatic treatment, without severe neutropenic fever and infection and no termination of chemotherapy due to intolerable toxic reactions.

This study has several limitations. Firstly, the conclusions were difficult to be extended to the whole world as the...
### Study or Subgroup GP PF

| Events Total | Events Total | Weight (%) | Risk Ratio M-H, Random, 95% CI |
|--------------|--------------|------------|-------------------------------|

#### 4.1.1 1Y
- **L. Zhang 2016**
  - 28 181 7 181 6.2 4.00 [1.79, 8.92]
- **SK Chan 2021**
  - 75 84 81 94 26.3 1.04 [0.93, 1.16]
- **Subtotal (95% CI)**
  - 265 275 32.5 1.98 [0.29, 13.44]

Total events 103 88

Heterogeneity: $\tau^2 = 1.83; \chi^2 = 22.45, df = 1 (P < 0.00001); I^2 = 96$

Test for overall effect: $Z = 0.70 (P = 0.49)$

#### 4.1.2 2Y
- **L. Zhang 2016**
  - 8 181 0 181 0.6 17.00 [0.99, 292.36]
- **SK Chan 2021**
  - 65 84 80 94 25.2 0.91 [0.79, 1.05]
- **Subtotal (95% CI)**
  - 265 275 25.8 3.09 [0.10, 97.55]

Total events 73 80

Heterogeneity: $\tau^2 = 5.32; \chi^2 = 6.04, df = 1 (P = 0.01); I^2 = 83$

Test for overall effect: $Z = 0.64 (P = 0.52)$

#### 4.1.3 3Y
- **L. Zhang 2016**
  - 3 181 0 181 0.6 7.00 [0.36, 134.55]
- **SK Chan 2021**
  - 60 84 77 94 24.4 0.87 [0.74, 1.03]
- **TK Yau 2006**
  - 22 34 25 41 16.8 1.06 [0.75, 1.50]
- **Subtotal (95% CI)**
  - 299 316 41.8 0.95 [0.73, 1.24]

Total events 85 102

Heterogeneity: $\tau^2 = 0.00; \chi^2 = 1.95, df = 1 (P = 0.16); I^2 = 49$

Test for overall effect: $Z = 0.21 (P = 0.83)$

### 5.1.1 1Y
- **SK Chan 2021**
  - 75 84 87 94 17.1 0.96 [0.88, 1.06]
- **XY Kong 2019**
  - 36 38 33 38 14.5 1.09 [0.94, 1.26]
- **Subtotal (95% CI)**
  - 122 132 31.6

Total events 111 120

Heterogeneity: $\tau^2 = 0.00; \chi^2 = 27.71, df = 6 (P = 0.0001); I^2 = 78$

Test for overall effect: $Z = 0.66 (P = 0.51)$

Test for subgroup differences: $\chi^2 = 4.41, df = 2 (P = 0.11), I^2 = 54.7$

### 5.1.3 3Y
- **MF Gu 2013**
  - 74 80 60 80 14.7 1.23 [1.07, 1.42]
- **SK Chan 2021**
  - 62 84 80 94 14.1 0.87 [0.74, 1.01]
- **XY Kong 2019**
  - 34 38 27 38 10.3 1.26 [1.00, 1.59]
- **Subtotal (95% CI)**
  - 202 212 39.0 1.10 [0.85, 1.41]

Total events 170 167

Heterogeneity: $\tau^2 = 0.04; \chi^2 = 13.09, df = 2 (P = 0.001); I^2 = 85$

Test for overall effect: $Z = 0.73 (P = 0.47)$

### 5.1.4 5Y
- **MY Wu 2020**
  - 117 144 81 91 16.5 0.91 [0.82, 1.02]
- **SK Chan 2021**
  - 57 84 77 94 12.9 0.83 [0.70, 0.99]
- **Subtotal (95% CI)**
  - 228 285 29.4 0.89 [0.81, 0.97]

Total events 174 158

Heterogeneity: $\tau^2 = 0.00; \chi^2 = 0.95, df = 1 (P = 0.33); I^2 = 0$

Test for overall effect: $Z = 2.53 (P = 0.01)$

Test for subgroup differences: $\chi^2 = 1.07, df = 2 (P = 0.51), I^2 = 0$

### Figure 5: PFS’s forest plot.

### Figure 6: Forest plot of DMFS.
### 2.1.1 Blood system side effects

| Study or Subgroup | GP Events | PF Total | Weight (%) | Risk Ratio M-H, Random, 95% CI |
|-------------------|-----------|----------|------------|--------------------------------|
| L Zhang 2016      | 100       | 104      | 11.0       | 2.40 [1.78, 3.25]              |
| QH Mo 2010        | 8         | 5        | 6.8        | 1.66 [0.62, 4.44]              |
| Q Yang 2022       | 3         | 5        | 5.3        | 0.31 [0.09, 1.09]              |
| SK Chan 2021      | 20        | 17       | 8.9        | 2.68 [1.41, 5.09]              |
| TK Yau 2006       | 20        | 20       | 9.3        | 2.40 [1.34, 4.31]              |
| XY Kong 2019      | 144       | 146      | 10.2       | 3.10 [1.98, 4.84]              |
| Y Jin 2012        | 114       | 116      | 12.3       | 1.84 [0.76, 4.43]              |
| ZW Cai 2009       | 13         | 14       | 6.1        | 1.88 [1.26, 2.82]              |
| **Subtotal (95% CI)** | 620      | 629      | 61.6       |                                |
| **Total events**  | 230       | 107      |            |                                |

Heterogeneity: Tau² = 0.19; Chi² = 19.75, df = 7 (P = 0.006); I² = 65%
Test for overall effect: Z = 3.06 (P = 0.002)

### 2.1.2 Gastrointestinal side effect

| Study or Subgroup | GP Events | PF Total | Weight (%) | Risk Ratio M-H, Random, 95% CI |
|-------------------|-----------|----------|------------|--------------------------------|
| L Zhang 2016      | 6         | 6        | 6.0        | 0.96 [0.32, 2.92]              |
| MY Wu 2020        | 0         | 0        | 0.0        | Not estimable                  |
| QH Mo 2010        | 3         | 4        | 4.7        | 0.78 [0.19, 3.16]              |
| Q Yang 2022       | 1         | 4        | 2.6        | 0.20 [0.02, 1.77]              |
| SK Chan 2021      | 0         | 2        | 1.6        | 0.13 [0.01, 2.32]              |
| TK Yau 2006       | 1         | 4        | 2.6        | 0.30 [0.04, 2.57]              |
| XY Kong 2019      | 29        | 38       | 11.2       | 0.97 [0.74, 1.25]              |
| Y Jin 2012        | 2         | 3        | 3.4        | 0.68 [0.11, 4.01]              |
| ZW Cai 2009       | 6         | 8        | 6.2        | 1.32 [0.45, 3.88]              |
| **Subtotal (95% CI)** | 764      | 720      | 38.4       |                                |
| **Total events**  | 47        | 59       |            |                                |

Heterogeneity: Tau² = 0.00; Chi² = 6.64, df = 7 (P = 0.47); I² = 0%
Test for overall effect: Z = 0.65 (P = 0.51)

Total (95% CI) 1384 1349 100.0 1.25 [0.85, 1.85]
Total events 277 166
Heterogeneity: Tau² = 0.34; Chi² = 58.57, df = 15 (P < 0.00001); I² = 74%
Test for overall effect: Z = 1.13 (P = 0.26)
Test for subgroup differences: Chi² = 8.82, df = 1 (P = 0.003), I² = 88.7%

**Figure 7:** The forest plot of side effects.

**Figure 8:** Continued.
included population was Asian, which might also lead to
great heterogeneity in this study. Secondly, the dosage of
drugs in the two groups in included studies was not exactly
the same, and the follow-up time was also inconsistent,
which might also affect our conclusion.

5. Conclusion

To sum up, the results of the 10 included studies showed that
the GP group had similar OS, PFS, and DMFS results as the PF
group, while the GP group had a higher clinical remission rate.
Therefore, GP may be the treatment of choice for metastatic
NPC. Future analyses should focus more on multicenter and
high-quality RCTs with large sample sizes.

Data Availability

The data that support the findings of this study are
available from the corresponding author upon reasonable
request.

Ethical Approval

All analyses were based on previously published studies;
thus, no ethical approval is required.

Consent

Patient consent is not required.

Conflicts of Interest

The authors declare that the research was conducted in the
absence of any commercial or financial relationships that
could be construed as potential conflicts of interest.

Authors’ Contributions

Le Yan and Hanxue Zheng have made equal contributions to
this article.

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Supplementary Materials

PubMed’s search strategy is described in Supplement 1.
(Supplementary Materials)

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