Prognostic impact of neoadjuvant chemotherapy in patients with locally advanced gastric cancer: a systematic review and meta-analysis

Jing Wang, Lin Liao, Jingling Huang, Huini Liao, Min Wu, Guanghui Tian, Sijuan Ding*

The Central Hospital of Yongzhou, China

Submitted: 25 November 2025; **Accepted:** 9 April 2026
Online publication: 23 June 2026

Arch Med Sci
DOI: https://doi.org/10.5114/aoms/220491

***Corresponding author:**
Sijuan Ding
The Central Hospital
of Yongzhou, China
E-mail: 874663807@qq.com

Abstract

Introduction: Previous studies have reported conflicting results regarding the efficacy of neoadjuvant chemotherapy (NAC) for locally advanced gastric cancer (LAGC). This may be attributable to limited sample sizes. Therefore, this meta-analysis aimed to synthesize existing evidence from relevant studies to provide robust conclusions.

Methods: A comprehensive literature search was conducted across five authoritative databases. Studies meeting predefined inclusion and exclusion criteria were selected, and the quality of included studies was subsequently assessed. Following data extraction, pooled effect estimates were calculated. Sensitivity analysis was used to evaluate the robustness of the findings, and funnel plots were generated to assess publication bias. Meta-regression was performed to explore potential sources of heterogeneity, and exploratory subgroup analyses were ultimately conducted.

Results: Eight included studies demonstrated good quality, with no substantial heterogeneity observed between them. The results indicated that NAC significantly improved survival outcomes in patients with LAGC. Specifically, for overall survival (OS), hazard ratio (HR) = 0.79, 95% confidence interval (CI) = 0.73–0.86, $Z = 5.25$, and $p < 0.00001$. For progression-free survival, HR = 0.64, 95% CI = 0.50–0.81, $Z = 3.74$, and $p = 0.002$. For disease-free survival, HR = 0.79, 95% CI = 0.67–0.92, $Z = 2.99$, and $p = 0.003$. The findings were robust, and no substantial publication bias was detected. Meta-regression analyses indicated that variations in population, age, and sex did not markedly influence survival outcomes. Subgroup analysis of OS based on population revealed that NAC improved prognosis for both European/American (HR = 0.80, 95% CI = 0.73–0.88, $Z = 4.62$, and $p < 0.00001$) and Asian (HR = 0.71, 95% CI = 0.55–0.91, $Z = 2.66$, and $p = 0.008$) patients with LAGC.

Conclusions: NAC markedly improves the prognosis of patients with LAGC.
Key words: neoadjuvant chemotherapy, locally advanced gastric cancer, meta-analysis, population, age, sex.

Introduction

Gastric cancer is the fifth most common malignancy and the third leading cause of cancer-related deaths globally. The disease accounts for nearly 1,000,000 new cases and over 650,000 deaths annually [1, 2]. Thus, gastric cancer remains a critical clinical challenge and a major focus of research worldwide. Owing to its nonspecific early symptoms, most patients are diagnosed at locally advanced or metastatic stages [3]. Surgery is the primary curative approach, yet fewer than 60% of newly diagnosed patients

are eligible for radical resection, and the five-year survival rate after surgery alone remains below 30% [4]. Locally advanced gastric cancer (LAGC) is defined by tumour invasion into deep gastric layers, such as the subserosa or serosa, or adjacent organs/tissues, without distant metastasis in the liver, lung, or peritoneum [5]. Once distant metastasis or extensive local infiltration occurs, patients lose the opportunity for surgical intervention [6]. Moreover, the 5-year survival rates for stages IIIA, IIIB, and IIIC are only 30.5%, 20.1%, and 8.3%, respectively [7]. Radical D2 resection is the globally accepted standard surgical treatment for resectable gastric cancer [8]. However, owing to the presence of micrometastases that are undetectable during surgery, LAGC has a high risk of local recurrence and distant metastasis. Notably, most patients relapse within 3 years, and the 5-year survival rate is below 50% [4]. Therefore, eradicating micrometastatic disease is crucial for improving outcomes in LAGC.

Suitably, neoadjuvant chemotherapy (NAC) reduces tumour size, minimizes the extent of surgical resection and associated complications, and subsequently decreases the risk of recurrence and metastasis [9]. Consequently, NAC has been increasingly adopted in the clinical management of LAGC and has demonstrated promising efficacy against LAGC [10–12]. However, other studies have failed to show a substantial survival benefit [13]. These conflicting results indicate that the role of NAC in LAGC remains uncertain. Moreover, high-quality clinical trials are lacking, and existing studies are limited by small sample sizes [14].

Correspondingly, meta-analysis enhances statistical power by pooling data from multiple small-scale studies. This increases sample size, reduces random errors, and improves the ability to detect true treatment effects [15]. When study results are inconsistent, meta-analysis can identify and quantify sources of heterogeneity, thereby aiding in the resolution of discrepancies among findings [16]. By systematically synthesizing available evidence, meta-analysis provides more robust conclusions than those of individual studies alone [17]. Accordingly, this meta-analysis comprehensively evaluates existing studies to provide evidence-based conclusions and clinical guidance regarding the use of NAC for LAGC.

Methods

Registration

This meta-analysis was registered on PROSPERO with the registration number CRD42025631616.

Search strategy

Five authoritative large-scale databases were searched: PubMed, Web of Science, Embase, Ovid Medline, and Cochrane Library. The search strategy was implemented based on the PICOS framework: P (population), patients with LAGC; I (intervention), NAC; C (comparator), patients in the control group were not given NAC; O (outcomes), the hazard ratios (HR) of overall survival (OS), progression-free survival (PFS), and disease-free survival (DFS); and S (study type), randomized controlled trials (RCT) or cohort studies. The relevant research was published between January 1, 2015 and January 1, 2025, with no language restrictions. The search strategy was conducted using Boolean logic operators in combination with key words: [("Locally Advanced") AND ("Stomach Neoplasms" OR "All the sub-terms of Stomach Neoplasms") AND ("Neoadjuvant chemotherapy" OR "All the sub-terms of Neoadjuvant chemotherapy")].

Study selection

The inclusion criteria were as follows: patients diagnosed with locally advanced gastric cancer; RCTs or cohort studies; experimental group receiving NAC; and reported outcomes including HRs and 95% confidence intervals (CI) of OS, PFS, and DFS.

The exclusion criteria were as follows: duplicate literature from different databases; studies with incomplete data; patients with other tumours; the subjects of the study are cells or animals; and conference abstracts, letters, reviews, case-control studies, and case reports.

Literature screening was performed using EndNote reference management software. Two independent investigators conducted initial screening by reviewing titles and abstracts, followed by full-text evaluation of potentially eligible articles. Articles receiving consensus approval from both investigators were included for final analysis. In cases of disagreement between the two primary investigators, a third investigator adjudicated by conducting an independent full-text review to reach a final decision.

Data extraction

Pre-designed tables were used to record data. The extracted data were as follows: the name of the first author; publication year; population; average age; sex ratio; and the HRs and 95% CIs of OS, PFS, and DFS.

Quality assessment of the included studies

Review Manager 5.3 was used to assess the risk of bias in RCTs. The included RCTs were evaluated using the Cochrane risk of bias tool, version 5.1 [18], which covers seven domains: random sequence generation; allocation concealment; blinding of participants and personnel; blinding of outcome assessment; incomplete outcome data; selective

reporting; and other potential biases. Each domain was rated as low risk, unclear risk, or high risk.

For cohort studies, quality was evaluated using the Newcastle-Ottawa Scale (NOS) [19]. The NOS comprises three domains (Selection, Comparability, and Exposure) with a maximum score of nine stars. The Selection domain (four items, one star each) evaluates case definition adequacy, case representativeness, control selection, and control definition. The Comparability domain (one item, up to two stars) assesses case-control matching by design/analysis. The Exposure domain (three items, one star each) examines exposure ascertainment, uniform ascertainment method, and non-response rate. Studies scoring ≥ 6 stars were considered high quality.

Data analysis

Statistical analyses were performed using Review Manager 5.3 and STATA 17. Review Manager 5.3 was used to pool effect sizes and conduct subgroup analyses, with the pooled effect sizes for OS, PFS, and DFS expressed as HRs with corresponding 95% CIs. Heterogeneity was assessed using the inconsistency index (I^2). When $I^2 < 50\%$ and $p > 0.1$, this indicated negligible heterogeneity and resulted in the use of a fixed-effects model; otherwise, a random-effects model was applied. Funnel plots were generated using STATA 18.0 to evaluate publication bias, whereas sensitivity analyses were conducted to assess the robustness of the findings. To explore potential sources of heterogeneity, meta-regression analyses were performed based on population, sex, and age. Finally, an exploratory subgroup analysis of OS was conducted across different populations.

Results

Search process

The systematic search of PubMed, Web of Science, Embase, Ovid Medline, and Cochrane Library initially yielded 2511 studies. Thereafter, 1207 duplicate studies were identified and removed. Subsequent screening of titles, abstracts, and study types led to the exclusion of 1271 studies. From the remaining 33 potentially eligible full-text articles, 25 were excluded owing to inadequate extractable data. Consequently, eight studies were included in the final meta-analysis. The study selection process is summarized in the PRISMA flow diagram (Figure 1).

Characteristics of the included studies

Table I summarizes the characteristics of the included studies [20-27]. All eight studies were published between 2017 and 2024, comprising five RCTs and three cohort studies. The pooled sample size totalled 12,335 participants. Three studies involved predominantly European and American populations, whereas five studies focused on Asian populations. OS was reported in six studies,

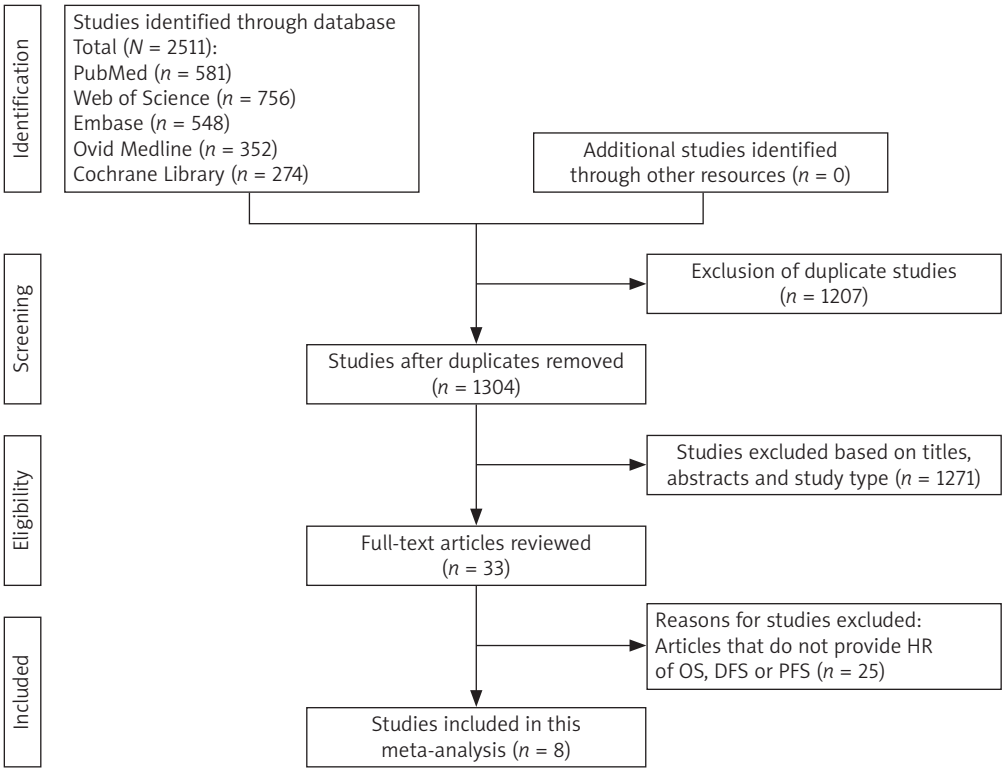

Figure 1. Search process

Table I. Characteristics of the 8 studies included in this meta-analysis

Author	Year	Population	Average age	Patient	Gender ratio		OS		DFS		PFS		Study design
					Male	Female	HR	95%CI	HR	95% CI	HR	95% CI	
Michael Stahl [20]	2017	European and American	/	119	0.91	0.09	0.65	0.42–1.01	/	/	0.64	0.39–1.06	RCT
Ali A. Mokdad [21]	2017	European and American	61	10086	0.88	0.12	0.79	0.72–0.88	/	/	/	/	Cohort study
Masayuki Kano [22]	2019	Asian	69.3	171	0.82	0.18	/	/	/	/	0.39	0.16–0.98	Cohort study
Yoon-Koo Kang [23]	2021	Asian	58	484	0.77	0.23	0.84	0.60–1.19	/	/	0.70	0.52–0.95	RCT
John V. Reynolds [24]	2023	European and American	63.8	377	0.90	0.10	1.03	0.77–1.38	0.89	0.68–1.17	/	/	RCT
Yuan Tian [25]	2023	Asian	52.5	280	0.72	0.28	0.64	0.42–0.97	0.69	0.48–0.99	/	/	RCT
Xinxin Wang [26]	2024	Asian	60	772	0.73	0.27	/	/	0.76	0.61–0.96	/	/	RCT
Jin-Ming Shi [27]	2024	Asian	53	46	0.80	0.20	0.39	0.17–0.90	/	/	0.47	0.21–1.03	Cohort study

DFS in three studies, and PFS in four studies, with some studies reporting multiple endpoints.

Quality assessment results

Quality assessments of the five included RCTs were conducted using the Cochrane Risk of Bias tool. In terms of random sequence generation, three studies described adequate methods and were judged as low risk, whereas two studies provided insufficient detail, thus resulting in an unclear risk judgment. In terms of allocation concealment, two studies implemented adequate concealment (low risk), whereas three studies did not describe their methods, leading to an unclear risk judgment. In terms of blinding of participants and personnel, two studies used blinding (low risk), whereas three studies did not and were consequently judged as high risk. In terms of blinding of outcome assessment, two studies blinded assessors (low risk), whereas three studies lacked a description of blinding for assessment; hence, this resulted in unclear risk. In terms of incomplete outcome data, all five studies either reported no dropouts or adequately described attrition, thereby meriting a low-risk judgment. In terms of selective outcome reporting, all five studies fully reported predefined outcomes and were judged as low risk. In terms of other potential biases, no other notable sources of bias were identified; all five studies were judged as low risk. Detailed assessments are presented in Figure 2.

Figure 2. Risk of bias summary graph of five included randomized controlled trials

Quality assessment of the three included cohort studies using the NOS showed that all achieved scores of ≥ 6 stars, thereby indicating good quality. Detailed NOS ratings are provided in Table II.

Meta-analysis results

Impact of NAC on LAGC prognosis

Meta-analysis of the eight included studies was performed to evaluate the association between NAC and prognosis in patients with LAGC. Key results are summarized in Figure 2. Six studies reported OS; low heterogeneity was observed (I^2 = 36% and p = 0.17), and a fixed-effect model yielded a pooled HR of 0.79 (95% CI = 0.7–0.86, Z = 5.25, and p < 0.00001; Figure 3 A). Moreover, four studies reported PFS; no significant heterogeneity was detected (I^2 = 0% and p = 0.56), and the pooled HR was 0.64 when using a fixed-effect model (95% CI = 0.50–0.81, Z = 3.74, and p = 0.002; Figure 3 B). In addition, three studies reported DF; no significant heterogeneity was observed (I^2 = 0% and p = 0.50), and the fixed-effect model produced a pooled HR of 0.79 (95% CI = 0.67–0.92, Z = 2.99, and p = 0.003; Figure 3 C). Collectively, these results demonstrate that NAC is strongly associated with improved survival outcomes in patients with LAGC.

Meta-regression analysis

Meta-regression analysis was performed to assess the influence of population (Asian vs. Euro-

Table II. Quality assessment of 3 cohort studies using NOS quality evaluation tool

Author	Year	Selection	Comparability	Exposure	Total points
Ali A. Mokdad	2017	★★★★	★★	★★★	9★
Masayuki Kano	2019	★★★★	★★	★★	8★
Jin-Ming Shi	2024	★★★	★	★★★	7★

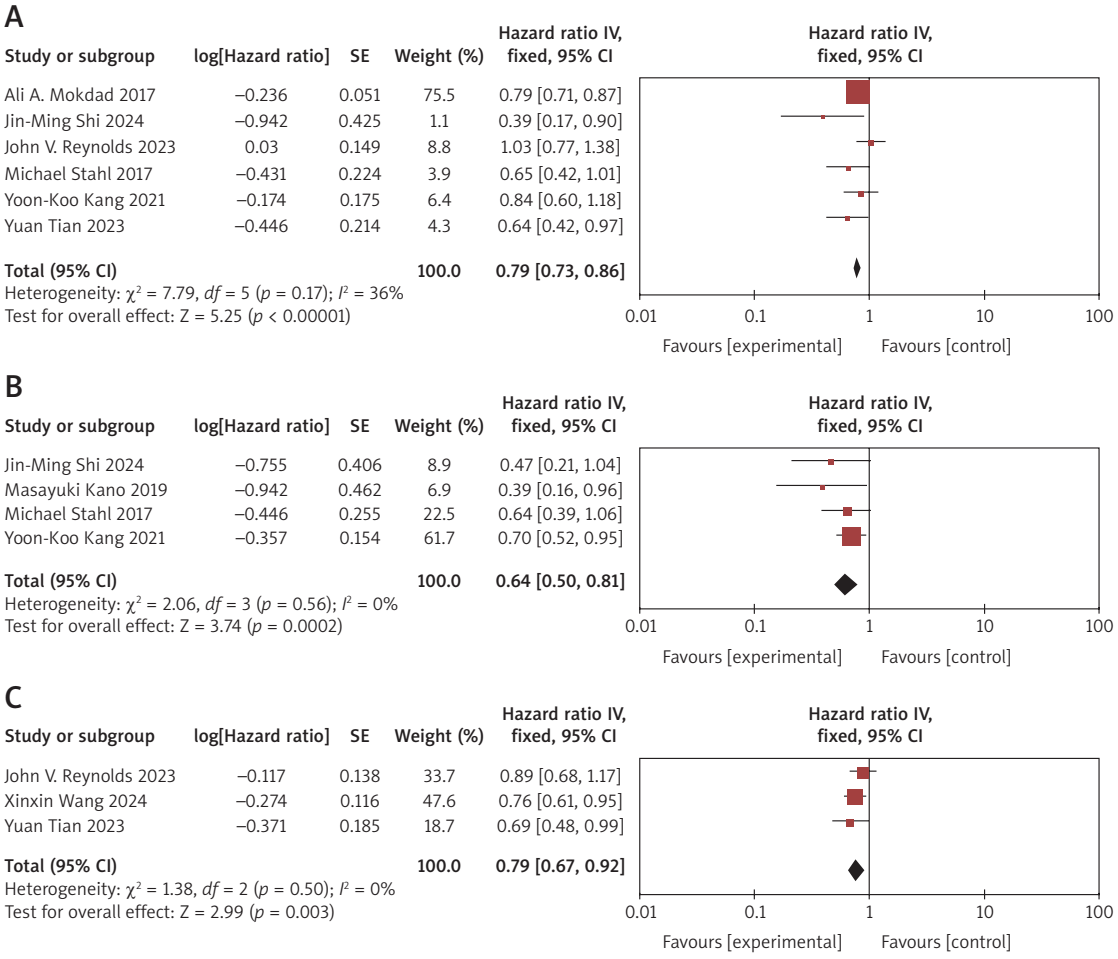

Figure 3. Forest plot of the impact of neoadjuvant therapy on survival outcomes in patients with locally advanced gastric cancer

pean and American), age (mean), and sex (male/female proportion) on survival outcomes. No statistically significant associations were found; all *p*-values exceeded 0.05 (Table III). This indicates that variations in population, age, and sex did not substantially modify the observed survival outcomes.

Table III. Meta-regression analysis

Parameter	*P*(OS)	*P*(PFS)	*P*(DFS)
Population	0.44	0.87	0.47
Age	0.15	0.71	0.47
Gender	0.46	0.86	0.47

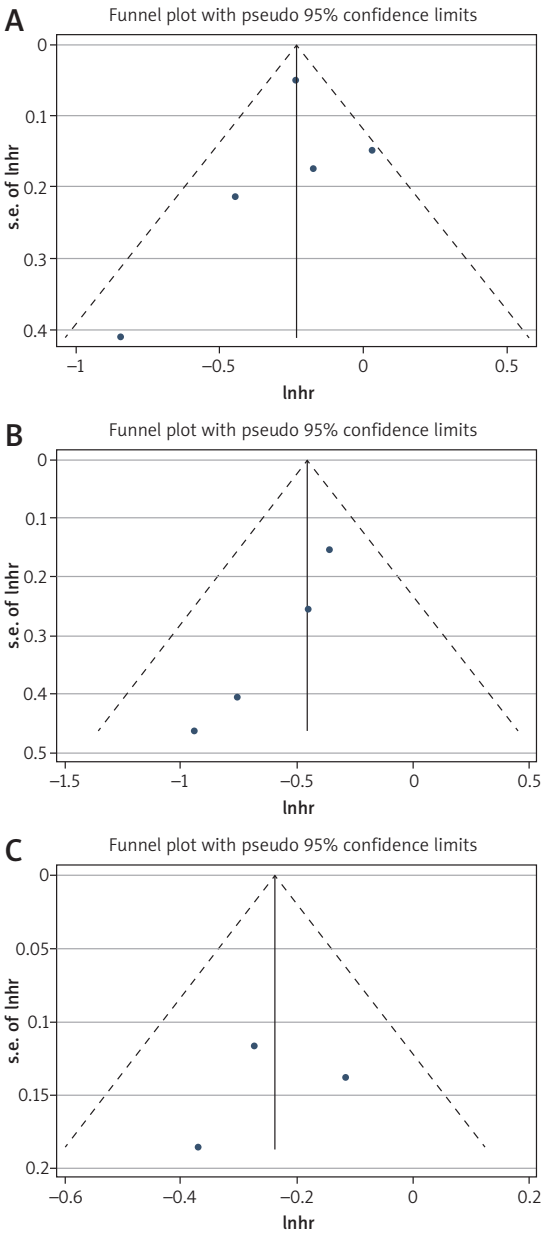

Figure 4. Funnel plot of the meta-analysis

Publication bias assessment and sensitivity analysis

Figure 4 presents the funnel plots for the pooled HRs of OS, PFS, and DFS. The studies are symmetrically distributed, which indicates an absence of publication bias. Figure 5 displays the sensitivity analysis results. Removal of any individual study yielded pooled HRs for OS, PFS, and DFS that remained within the original confidence intervals. The pooled HRs for OS, PFS, and DFS were not markedly influenced by any single study, thereby demonstrating the robustness and reliability of this meta-analysis.

Subgroup analysis

To explore the influence of additional factors on outcomes, subgroup analyses were planned. How-

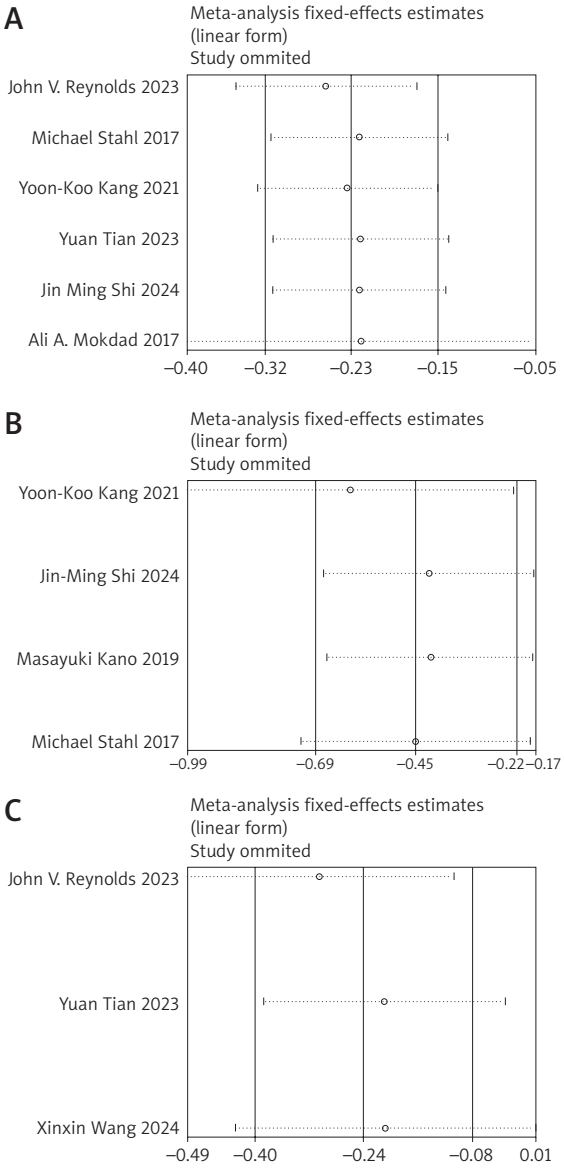

Figure 5. Sensitivity analysis of the meta-analysis

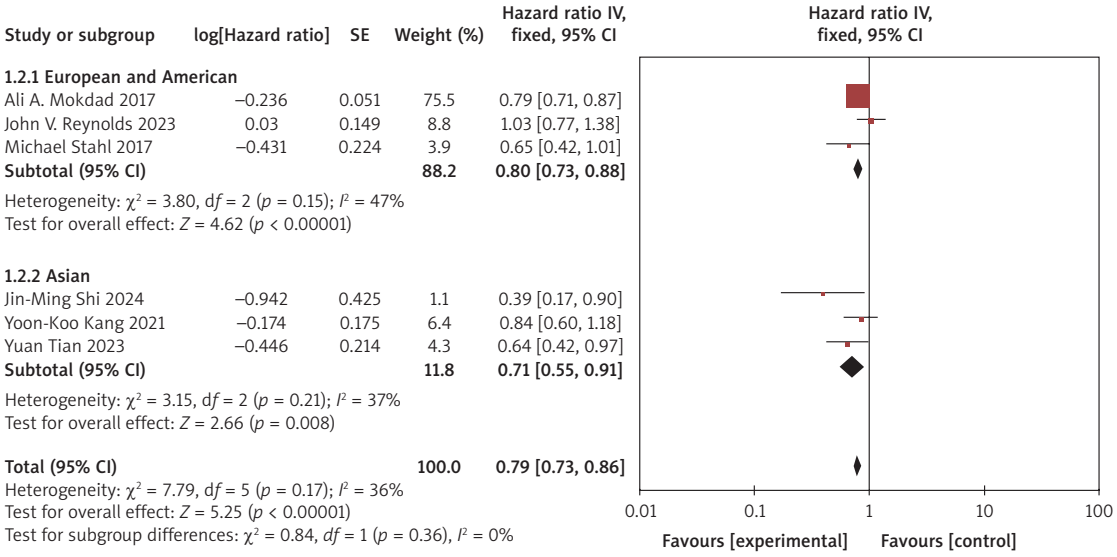

Figure 6. Forest plot of the impact of neoadjuvant therapy on overall survival (OS) in patients with locally advanced gastric cancer in different populations

ever, owing to insufficient data on variables, such as sex and age, subgroup analyses were ultimately conducted based solely on population groups. Subgroup analyses for PFS and DFS were not performed owing to the limited number of available studies reporting these outcomes. Consequently, subgroup analysis focused on OS according to ethnic group (Figure 6). For the European and American population (four studies), OS heterogeneity was low (I^2 = 47% and p = 0.15 > 0.1), and a fixed-effects model was applied. The pooled HR was 0.80 (95% CI = 0.73–0.88, Z = 4.62, and p < 0.00001), thereby indicating a statistically significant benefit. For the Asian population (three studies), heterogeneity was low (I^2 = 37% and p = 0.21 > 0.1), and the pooled HR was 0.71 when using a fixed-effects model (95% CI = 0.55–0.91, Z = 2.66, and p = 0.008). This also demonstrates a statistically significant benefit. Collectively, these results demonstrate that NAC substantially improves OS compared to no NAC in both European/American and Asian patients with LAGC.

Discussion

This meta-analysis quantitatively evaluated existing literature to investigate the prognostic impact of NAC in LAGC. NAC significantly improved OS (HR = 0.79, 95% CI = 0.73–0.86, Z = 5.25, and p < 0.00001), thereby corresponding to a 21% reduction in mortality risk. Similarly, PFS demonstrated a substantial 36% reduction in disease progression or death risk (HR = 0.64, 95% CI = 0.50–0.81, Z = 3.74, and p = 0.002). Furthermore, DFS analysis indicated a 21% reduction in recurrence risk (HR = 0.79, 95% CI = 0.67–0.92, Z = 2.99, and p = 0.003). Collectively, NAC confers pronounced clinical benefits in terms of managing LAGC.

Surgical resection remains the established curative approach for LAGC without adjacent organ invasion or distant metastasis [28]. Nevertheless, patient prognosis remains poor, primarily owing to postoperative recurrence and distant metastasis driven by residual tumour cells and micrometastases [29]. Hence, eliminating micrometastases is crucial for optimizing patient prognosis. The therapeutic benefit of NAC in LAGC was first established by Cunningham *et al.* in 2006 [30]. Their RCT demonstrated superior OS (HR = 0.75, 95% CI = 0.60–0.93, and p = 0.009) and PFS (HR = 0.66, 95% CI = 0.53–0.81, and p < 0.001) in patients receiving three preoperative cycles of etoposide and cisplatin plus 5-fluorouracil compared to surgery alone. In addition, Sasaki *et al.* [31] reported markedly improved prognosis in Asian populations using docetaxel-cisplatin-S-1 neoadjuvant therapy, thereby achieving 2- and 3-year OS rates of 89% and 70%, respectively. Subsequent studies continue to validate NAC efficacy. In particular, in an RCT, Zhang *et al.* [32] observed clinically significant improvement with perioperative S-1-oxaliplatin versus adjuvant capecitabine-oxaliplatin following D2 gastrectomy (DFS-HR = 0.77, 95% CI = 0.61–0.97, and p = 0.028). Moreover, a phase II clinical trial further demonstrated 92.3% R0 resection and 62.5% pathological response rates with preoperative chemotherapy [33]. Furthermore, synergistic enhancement of therapeutic efficacy has been observed when combining radiotherapy or immune checkpoint inhibitors with chemotherapy in the neoadjuvant setting [10, 34, 35]. The therapeutic efficacy of NAC in LAGC is well established in most studies, which is consistent with the current meta-analysis findings. However, some trials report limited clinical utility. Specifically, a Japanese

clinical trial demonstrated no survival benefit of NAC in resectable gastric cancer (OS-HR = 0.916, 95% CI = 0.679–1.236, p = 0.28) [13]. This lack of benefit may be attributable to the limited anti-tumour efficacy of S-1 plus cisplatin against scirrhous-type gastric carcinoma cells. Concurrently, a phase III trial from South Korea demonstrated that NAC significantly improved PFS (HR = 0.70, 95% CI = 0.52–0.95, p = 0.023); however, no statistically significant difference in OS was observed (HR = 0.84, 95% CI = 0.60–1.19, p = 0.338) [23]. This discrepancy likely stems primarily from the trial design, in which PFS was the primary endpoint and OS was a secondary outcome. Furthermore, the relatively short follow-up period resulted in an insufficient number of OS events, with survival data missing for some patients. This consequently yielded a wide confidence interval for the HR.

Subgroup analysis of OS by population revealed survival benefits in both Asian and European/American populations. Low heterogeneity was observed within and between these subgroups (I^2 < 50%, p > 0.1). Furthermore, meta-regression confirmed no significant differences in survival outcomes (OS, PFS, DFS) between ethnic groups (all p-values exceeded 0.05). Fluorouracil combined with oxaliplatin has been widely adopted as an NAC regimen for patients with LAGC in Asia, with doublet NAC demonstrating good feasibility in Asian populations [36, 37]. Furthermore, the efficacy of triplet NAC (docetaxel, oxaliplatin, and S-1) has also been demonstrated in Asian patients [38]. In Western countries, the standard NAC regimen consists of docetaxel, oxaliplatin, leucovorin, and 5-fluorouracil [39]. However, the regional differences in these treatment methods did not translate into statistically significant survival differences (p = 0.36). This validates the universal applicability of NAC in different populations. Notably, the limited number of studies within each subgroup inherently reduces the statistical power to detect a genuine subgroup effect and increases uncertainty regarding the point estimates. Therefore, the differences between the subgroups require verification via large-scale RCTs. Meta-regression analyses further revealed no substantial influence of patient sex or age on the efficacy of NAC for LAGC.

In conclusion, this meta-analysis possesses several notable strengths. First, the meta-analysis clarifies conflicting findings from previous studies on NAC for LAGC, thus providing comprehensive evidence and reliable conclusions. Second, the analysis addresses the issue of limited reliability in prior results stemming from insufficient sample sizes by pooling data across studies. Nevertheless, some limitations warrant consideration. The strict application of inclusion and exclusion criteria resulted in a limited number of eligible studies. Consequently, the findings require validation in future RCTs. Moreover, the scarcity of data on PFS and DFS precluded subgroup analyses based on population, sex, or age.

NAC substantially improves the prognosis of patients with LAGC.

Funding

No external funding.

Ethical approval

Not applicable.

Conflict of interest

The authors declare no conflict of interest.

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2018; 68: 394-424.
2. Sundar R, Nakayama I, Markar SR, et al. Gastric cancer. Lancet 2025; 405: 2087-102.
3. Raptis D, Maak M, Krautz C, et al. Surgical and oncological outcome after extended lymph node dissection for carcinoma of the stomach and the esophagogastric junction: a retrospective analysis from an experienced single center. Arch Med Sci 2021; 20: 124-32.
4. Ychou M, Boige V, Pignon JP, et al. Perioperative chemotherapy compared with surgery alone for resectable gastroesophageal adenocarcinoma: an FNCLCC and FFCD multicenter phase III trial. J Clin Oncol 2011; 29: 1715-21.
5. Lordick F, Carneiro F, Cascinu S, et al. Gastric cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. Ann Oncol 2022; 33: 1005-20.
6. Ajani JA, D'Amico TA, Bentrem DJ, et al. Gastric Cancer, Version 2.2025, NCCN Clinical Practice Guidelines In Oncology. J Natl Compr Canc Netw 2025; 23: 169-91.
7. In H, Solsky I, Palis B, Langdon-Embry M, Ajani J, Sano T. Validation of the 8th Edition of the AJCC TNM Staging System for Gastric Cancer using the National Cancer Database. Ann Surg Oncol 2017; 24: 3683-91.
8. Japanese Gastric Cancer Association. Japanese gastric cancer treatment guidelines 2018 (5th edition). Gastric Cancer 2021; 24: 1-21.
9. Su PF, Yu JC. Progress in neoadjuvant therapy for gastric cancer. Oncol Lett 2022; 23: 172.
10. Jiang H, Yu X, Li N, et al. Efficacy and safety of neoadjuvant sintilimab, oxaliplatin and capecitabine in patients with locally advanced, resectable gastric or gastroesophageal junction adenocarcinoma: early results of a phase 2 study. J Immunother Cancer 2022; 10: e003635.
11. Chang C, Cai Z, Cheng K, et al. Efficacy and safety of S-1 plus oxaliplatin combined with apatinib and camrelizumab as neoadjuvant therapy for patients with locally advanced gastric or gastroesophageal junction adenocarcinoma: a protocol for a single-arm phase II trial. Updates Surg 2025; 77: 165-74.
12. Li N, Li Z, Fu Q, et al. Efficacy and safety of neoadjuvant sintilimab in combination with FLOT chemotherapy in patients with HER2-negative locally advanced gastric or gastroesophageal junction adenocarcinoma: an inves-

tigator-initiated, single-arm, open-label, phase II study. Int J Surg 2024; 110: 2071-84.
13. Iwasaki Y, Terashima M, Mizusawa J, et al. Gastrectomy with or without neoadjuvant S-1 plus cisplatin for type 4 or large type 3 gastric cancer (JCOG0501): an open-label, phase 3, randomized controlled trial. Gastric Cancer 2021; 24: 492-502.
14. Koerner AS, Moy RH, Ryeom SW, Yoon SS. The present and future of neoadjuvant and adjuvant therapy for locally advanced gastric cancer. Cancers 2023; 15: 4114.
15. Papakostidis C, Giannoudis PV. Meta-analysis. What have we learned?. Injury 2023; 54 Suppl 3: S30-4.
16. Li P, Shuai P, Shen S, et al. Perturbations in gut microbiota composition in patients with polycystic ovary syndrome: a systematic review and meta-analysis. BMC Med 2023; 21: 302.
17. Lin YC, Liang YJ, Yang HC. Evaluating statistical significance in a meta-analysis by using numerical integration. Comput Struct Biotechnol J 2022; 20: 3615-20.
18. Bossuyt PM, Deeks JJ, Leeflang MM, Takwoingi Y, Flemyng E. Evaluating medical tests: introducing the Cochrane Handbook for Systematic Reviews of Diagnostic Test Accuracy. Cochrane Database Syst Rev 2023; 7: ED000163.
19. Zhang Y, Huang L, Wang D, Ren P, Hong Q, Kang D. The ROBINS-I and the NOS had similar reliability but differed in applicability: a random sampling observational studies of systematic reviews/meta-analysis. J Evid Based Med 2021; 14: 112-22.
20. Stahl M, Walz MK, Riera-Knorrenschild J, et al. Preoperative chemotherapy versus chemoradiotherapy in locally advanced adenocarcinomas of the oesophagogastric junction (POET): long-term results of a controlled randomised trial. Eur J Cancer 2017; 81: 183-90.
21. Mokdad AA, Yopp AC, Polanco PM, et al. Adjuvant chemotherapy vs postoperative observation following preoperative chemoradiotherapy and resection in gastroesophageal cancer: a propensity score-matched analysis. JAMA Oncol 2018; 4: 31-8.
22. Kano M, Hayano K, Hayashi H, et al. Survival benefit of neoadjuvant chemotherapy with S-1 plus docetaxel for locally advanced gastric cancer: a propensity score-matched analysis. Ann Surg Oncol 2019; 26: 1805-13.
23. Kang YK, Yook JH, Park YK, et al. PRODIGY: a phase III study of neoadjuvant docetaxel, oxaliplatin, and S-1 plus surgery and adjuvant S-1 versus surgery and adjuvant S-1 for resectable advanced gastric cancer. J Clin Oncol 2021; 39: 2903-13.
24. Reynolds JV, Preston SR, O'Neill B, et al. Trimodality therapy versus perioperative chemotherapy in the management of locally advanced adenocarcinoma of the oesophagus and oesophagogastric junction (Neo-AEGIS): an open-label, randomised, phase 3 trial. Lancet Gastroenterol Hepatol 2023; 8: 1015-27.
25. Tian Y, Yang P, Guo H, et al. Neoadjuvant docetaxel, oxaliplatin plus capecitabine versus oxaliplatin plus capecitabine for patients with locally advanced gastric adenocarcinoma: long-term results of a phase III randomized controlled trial. Int J Surg 2023; 109: 4000-8.
26. Wang X, Lu C, Wei B, et al. Perioperative versus adjuvant S-1 plus oxaliplatin chemotherapy for stage II/III resectable gastric cancer (RESONANCE): a randomized, open-label, phase 3 trial. J Hematol Oncol 2024; 17: 17.
27. Shi JM, Li N, Jiang LM, et al. A prospective phase II clinical trial of total neoadjuvant therapy for locally advanced gastric cancer and gastroesophageal junction adenocarcinoma. Sci Rep 2024; 14: 7522.
28. Kim HD, Ryu MH, Kang YK. Adjuvant treatment for locally advanced gastric cancer: an Asian perspective. Gastric Cancer 2024; 27: 439-50.
29. Manzanedo I, Pereira F, Serrano Á, Pérez-Viejo E. Review of management and treatment of peritoneal metastases from gastric cancer origin. J Gastrointest Oncol 2021; 12 (Suppl 1): S20-9.
30. Cunningham D, Allum WH, Stenning SP, et al. Perioperative chemotherapy versus surgery alone for resectable gastroesophageal cancer. N Engl J Med 2006; 355: 11-20.
31. Sasaki K, Onodera S, Otsuka K, et al. Validity of neoadjuvant chemotherapy with docetaxel, cisplatin, and S-1 for resectable locally advanced gastric cancer. Med Oncol 2017; 34: 139.
32. Zhang X, Liang H, Li Z, et al. Perioperative or postoperative adjuvant oxaliplatin with S-1 versus adjuvant oxaliplatin with capecitabine in patients with locally advanced gastric or gastro-oesophageal junction adenocarcinoma undergoing D2 gastrectomy (RESOLVE): an open-label, superiority and non-inferiority, phase 3 randomised controlled trial. Lancet Oncol 2021; 22: 1081-92.
33. Ota M, Saeki H, Uehara H, et al. Phase II clinical trial to study the safety and efficacy of combined S-1+oxaliplatin therapy as neoadjuvant chemotherapy for locally advanced gastric cancer in older patients. Int J Clin Oncol 2023; 28: 1166-75.
34. Lin JX, Tang YH, Zheng HL, et al. Neoadjuvant camrelizumab and apatinib combined with chemotherapy versus chemotherapy alone for locally advanced gastric cancer: a multicenter randomized phase 2 trial. Nat Commun 2024; 15: 41.
35. Tang Z, Wang Y, Liu D, et al. The Neo-PLANET phase II trial of neoadjuvant camrelizumab plus concurrent chemoradiotherapy in locally advanced adenocarcinoma of stomach or gastroesophageal junction. Nat Commun 2022; 13: 6807.
36. Iwatsuki M, Orita H, Kobayashi K, et al. Phase II study of S-1 and oxaliplatin as neoadjuvant chemotherapy for locally advanced adenocarcinoma of the gastric or esophagogastric junction: KSCC1601. Gastric Cancer 2022; 25: 180-7.
37. Terazawa T, Matsuyama J, Goto M, et al. A phase II study of perioperative capecitabine plus oxaliplatin therapy for clinical SS/SE N1-3 M0 Gastric Cancer (OGSG 1601). Oncologist 2020; 25: 119-e208.
38. Saito T, Kurokawa Y, Takahashi T, et al. Neoadjuvant docetaxel, oxaliplatin and S-1 (DOS) combination chemotherapy for patients with resectable adenocarcinoma of esophagogastric junction. Gastric Cancer 2022; 25: 966-72.
39. Kraemer M, Wirsik NM, Alakus H, et al. Adjuvant FLOT provides survival benefit for oesophagogastric junction and gastric adenocarcinoma patients with low tumour regression after neoadjuvant chemotherapy. Int J Cancer 2025; 157: 2558-68.