Am J Transl Res 2025;17(7):4867-4878
www.ajtr.org /ISSN:1943-8141/AJTR0164506

Review Article

Rituximab plus chemotherapy for pediatric mature B-cell non-Hodgkin's lymphoma: a systematic review and meta-analysis

Xiuli Zhu, Yuqiao Diao, Yan Chen

Department of Pediatrics, The Fourth Hospital of Hebei Medical University, Shijiazhuang 050000, Hebei, China

Received March 12, 2025; Accepted June 17, 2025; Epub July 15, 2025; Published July 30, 2025

Abstract: Objective: To conduct a systematic review and meta-analysis evaluating the efficacy and safety of rituximab combined with chemotherapy for the treatment of mature B-cell non-Hodgkin's lymphoma (NHL) in children and adolescents. Methods: A comprehensive search of PubMed, Embase, the Cochrane Library, and Web of Science was performed to identify relevant studies published up to October 2024. Eligible studies included those involving patients aged 0-15 years diagnosed with mature B-cell NHL. Data were extracted on event-free survival (EFS), overall survival (OS), complete remission rate (CRR), adverse events, immune reconstitution (IgG levels), and recurrence rates. Meta-analyses were conducted using RevMan 5.0. Results: A total of 11 studies comprising 1,522 participants were included. The addition of rituximab to chemotherapy significantly improved EFS (hazard ratio [HR] = 0.40, 95% confidence interval [CI]: 0.36-0.45, $P < 0.05$) and OS (HR = 0.38, 95% CI: 0.34-0.42, $P < 0.05$). CRR was also significantly higher in the rituximab group (odds ratio [OR] = 2.72, 95% CI: 1.76-4.21, $P < 0.05$). However, a higher incidence of adverse effects was observed (OR = OR= 1.92, 95% CI: 1.25-2.94, $P < 0.05$). There were no significant differences in recurrence rate or IgG levels between groups. Conclusion: The addition of rituximab to chemotherapy significantly improved EFS, OS, and CRR in children and adolescents with mature B-cell NHL. Despite an increased risk of toxicity, the survival and remission benefits support the use of rituximab in this population.

Keywords: Rituximab treatment, chemotherapy regime, children and adolescents, mature B-cell non-Hodgkin's lymphoma, effectiveness and safety

Introduction

Mature B-cell non-Hodgkin's lymphoma (NHL) is a malignant disorder originating from mature B lymphocytes, a specific subset of white blood cells [1]. It predominantly affects children and adolescents and is associated with substantial morbidity and mortality. The uncontrolled proliferation of abnormal B cells can lead to tumor formation, systemic symptoms, and disease progression if left untreated [2].

B-cell NHL is highly responsive to chemotherapy and radiotherapy, with chemotherapy being the standard treatment approach [3, 4]. However, limitations such as suboptimal long-term efficacy, high recurrence rates, and significant cytotoxicity underscore the need for more effective and safetherapeutic strategies. Rituximab, an anti-CD20 monoclonal antibody, exerts cytotoxic effects on target cells and has been widely used in the treatment of NHL [5]. Importantly, pediatric and adult forms of mature B-cell NHL differ in molecular characteristics, which influence prognosis and treatment response. While chemotherapy alone is often more effective in children than in adults, the added benefit of rituximab in pediatric cases must be weighed against the potential for adverse effects [6, 7].

Given the demonstrated efficacy of rituximab in adults with B-cell NHL, its application in pediatric and adolescent populations has attracted increasing interest. Recent studies have investigated the effects of rituximab combined with chemotherapy on survival outcomes, complete remission rates, toxicity profiles, immune reconstitution, and recurrence in children and adolescents [8, 9]. However, a systematic and com-

https://doi.org/10.62347/GOXN1938

prehensive evaluation of these findings is still lacking.

Therefore, this study aimed to systematically assess the efficacy and safety of rituximab in combination with chemotherapy for the treatment of mature B-cell NHL in pediatric and adolescent patients. By synthesizing current evidence, this review seeks to provide a clearer understanding of the benefits and risks associated with rituximab in this population.

Materials and methods

Search strategy

This systematic review and meta-analysis employed a comprehensive search strategy. We systematically searched four major databases: PubMed, Embase, the Cochrane Library, and Web of Science. Search terms included key concepts such as “rituximab”, “chemotherapy”, “mature B-cell non-Hodgkin’s lymphoma”, “adolescents” and “pediatric”. Boolean operators were used to optimize the search strategy. Only studies published in English were included. Additionally, we manually screened the reference lists of all included articles to minimize the risk of missing relevant studies.

This study was registered on the INPLASY platform (International Platform of Registered Systematic Review and Meta-analysis Protocols) under the registration number 202520-120.

Eligibility criteria

(1) Patients aged 0-15 years diagnosed with mature B-cell NHL. (2) Studies must clearly describe diagnostic methods, including histological examination, immunohistochemistry, or molecular genetic testing. (3) Randomized controlled trials (RCTs), cohort studies, and case-control studies were included. (4) Only articles published in English were included, primarily due to practical limitations and the predominance of high-quality medical literature in English. (5) Only peer-reviewed, published articles were included to ensure the credibility and validity of the evidence. (6) The experimental group received rituximab combined with chemotherapy. The chemotherapy regimen should specify drug types (e.g., cyclophosphamide, doxorubicin, vincristine, prednisone), doses, and duration. (7) The control group received chemotherapy alone. (8) Studies included outcome measures:

Efficacy outcomes: Event-free survival (EFS), overall survival (OS), and complete response rate (CRR).

Safety outcomes: Incidence and severity of treatment-related toxicities, including neutropenia, thrombocytopenia, gastrointestinal toxicity, and other organ-specific adverse effects.

Immune reconstitution: Post-treatment recovery of immune function, including lymphocyte counts, immunoglobulin levels, and other immune-related data.

Recurrence rate: The proportion of patients with disease recurrence after treatment.

Data extraction

Data were systematically extracted from each eligible study, including study design, participant demographics, intervention protocols, outcome indicators, and adverse events. Two independent reviewers conducted the data extraction. Discrepancies were resolved through discussion or consultation with a third reviewer if necessary.

Quality assessment

The Cochrane Risk of Bias Tool was used to assess the quality of randomized controlled trials, while the Newcastle-Ottawa Scale was applied to non-randomized studies. To evaluate the overall strength of the evidence, we assessed consistency (reproducibility across studies), directness (relevance to the research question), and precision (narrowness of confidence intervals). The GRADE system was used to integrate these dimensions and grade the quality of evidence.

Statistical analysis

All statistical analyses were performed using RevMan 5.0 (Cochrane Collaboration). Heterogeneity across studies was evaluated using the Q test and I^2 statistic. A random-effects model was applied when significant heterogeneity was detected ($P < 0.05$ and $I^2 > 50\%$); otherwise, a fixed-effect model was used.

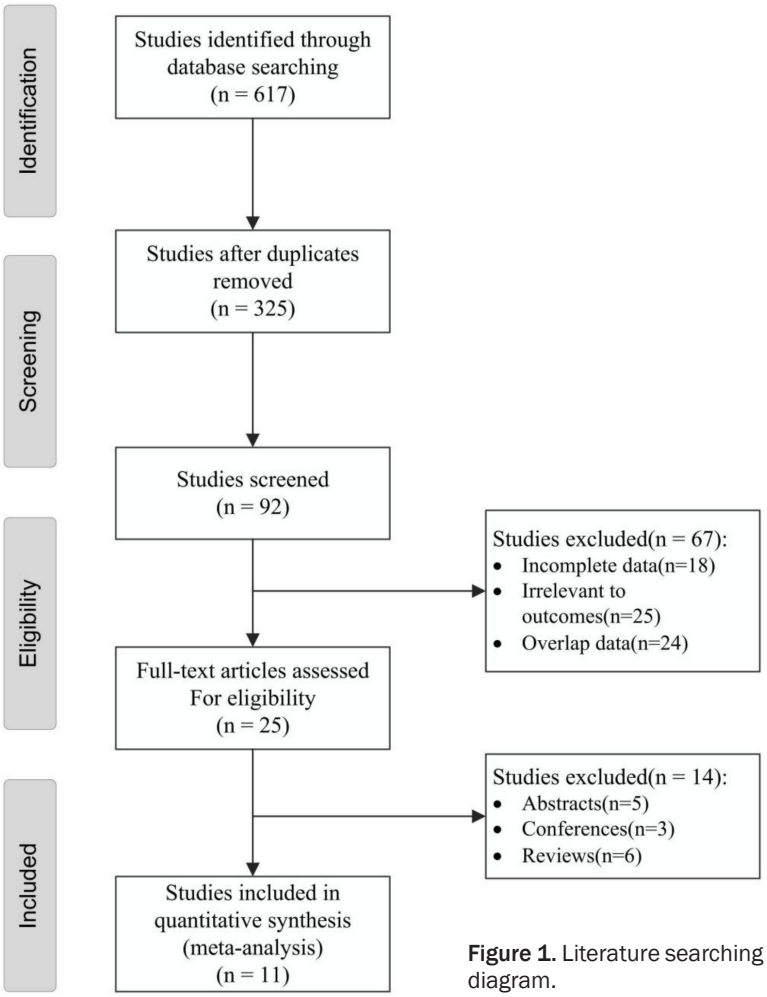

Figure 1. Literature searching diagram.

For time-to-event outcomes (e.g., EFS, OS), hazard ratios (HRs) with 95% confidence intervals (CIs) were calculated. For continuous outcomes, mean differences (MDs) with 95% CIs were used. Publication bias was assessed using funnel plots. A *P*-value < 0.05 was considered significant.

Results

Literature screening

A total of 617 publications were initially identified through comprehensive database searches. After removing duplicates, 325 records remained for title and abstract screening by two independent reviewers. Following this, 25 full-text articles were assessed for eligibility, and ultimately, 11 studies met the inclusion criteria for analysis. The literature selection process is illustrated as aflowchart (**Figure 1**).

Characteristics of included studies

The included studies comprised randomized controlled trials, retrospective cohort studies, and prospective cohort studies, encompassing a total of 1,522 participants. These studies compared the efficacy of rituximab combined with chemotherapy versus chemotherapy alone in children and adolescents with mature B-cell NHL. **Table 1** summarizes the key characteristics of the included studies.

Risk of bias assessment

Risk of bias varied among the included studies. Some demonstrated low risk across all domains, while others showed moderate to high risk in certain areas. Nevertheless, the overall quality was deemed acceptable for meta-analysis, supported by consistent results and robustness in sensitivity analyses (**Figure 2**).

Pooled EFS

Seven studies reported 3- or 5-year EFS rates. Pooled results showed that EFS was significantly higher in the rituximab plus chemotherapy group compared to the chemotherapy-alone group (HR = 0.40, 95% CI: 0.36-0.45, P < 0.05) (**Figure 3**).

Overall survival

Ten studies reported OS data. The addition of rituximab significantly improved overall survival, with a pooled HR of 0.38 (95% CI: 0.34-0.42, P < 0.05), indicating a notably reduced risk of death in the combination group compared to chemotherapy alone (**Figure 4**).

Complete remission rate(CRR)

Seven studies assessed complete remission. The meta-analysis revealed a significantly high-

Table 1. Baseline characteristics of the included studies

Reference	Study Type	Study Population	Treatment Arms	Total Cases (a)	Study Cases (b)	Gender (Male/ Female, Cases)	Follow-up Time (Months)	Age (Years)	Outcome Measures
Minard et al. [21]	Randomized, phase 3 clinical trial	Children and Adolescents	R + LMB 96 vs. LMB 96	328	164	135/29	39.9	9.2 ± 4.0	(1) (5)
Fu et al. [22]	Retrospective cohort study	Children and Adolescents	R + BFM95 vs. BFM95	69	46	35/11	106.8	6.9 (10-14.3)	(1) (4) (6)
Wang et al. [23]	Retrospective cohort study	Children and Adolescents	Rituximab + Chemotherapy vs. Chemotherapy	435	202	161/41	37	6.1 (0.6-16.2)	(1) (3)
Mori et al. [24]	Single-arm multicenter test	Children and Adolescents	Rituximab + Chemotherapy vs. Chemotherapy	49	44	34/10	47.5	8 (1-17)	(1) (2) (4)
Gao et al. [25]	Prospective Cohort	Children	Low-risk group: COP + R High-risk group: COP + R + high-dose methotrexate	419	419	343/76	54	-	(1) (2) (4)
Dourthe et al. [26]	Prospective Cohort	Children and Adolescents	Rituximab + LMB2001 vs. LMB2001	42	21	9/12	85.2 (69.6-133.2)	15 (10-18)	(1) (2)
Dong et al. [12]	Prospective Cohort	Children	Rituximab + Chemotherapy vs. Chemotherapy	85	41	29/12	36	7.11 (2-13)	(5)
Rigaud et al. [27]	Retrospective cohort study	Children and Adolescents	Rituximab + LMB2001 vs. LMB2001	33	27	7/20	81.6	10.3 (1.9-17.9)	(2) (3)
Maschan et al. [28]	Retrospective cohort study	Children	Rituximab + Chemotherapy	246	231	179/52	46	9 (2-18)	(1) (2) (3)
Osumi et al. [29]	Retrospective cohort study	Children	Rituximab + Chemotherapy	33	28	21/7	70.8	9.7 (2.3-16.5)	(2) (3) (6)
Samochatova et al. [30]	Prospective Cohort	Children and Adolescents	Rituximab + Chemotherapy	83	20	-	65.2	8.84 (2.8-16.9)	(2) (3) (6)

LMB: standard lymphomes malins B; BFM: Berlin-Frankfurt-Münster; R: Rituximab; COP: Cyclophosphamide + Vincristine + Prednisone. (1) Event-free survival (EFS); (2) Overall survival (OS); (3) Complete remission rate; (4) Toxic effects; (5) Immune reconstitution; (6) Recurrence rate.

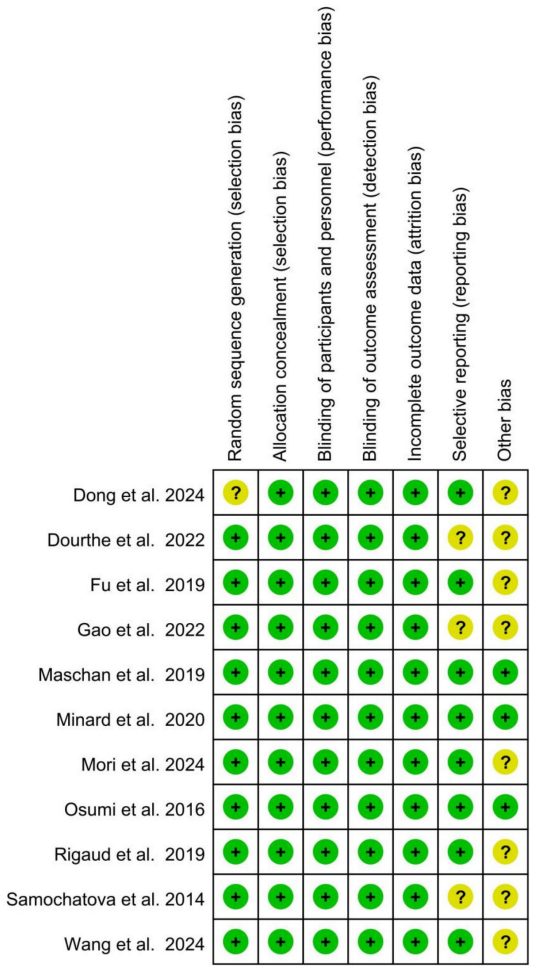

Figure 2. Risk of bias.

er CRR in the rituximab plus chemotherapy group (OR = 2.72, 95% CI: 1.76-4.21, P < 0.05), suggesting superior efficacy of the combination therapy in inducing remission (**Figure 5**).

Incidence of toxic effects

Four studies reported adverse event data. The pooled results indicated a higher incidence of certain toxicities in the rituximab group (OR = 0.27, 95% CI: 0.14-0.52, P < 0.05) (**Figure 6**).

The most commonly reported toxicities were infections, neutropenia, thrombocytopenia, and liver function abnormalities.

Immune reconstitution

Analysis of peripheral B-cell counts showed a marked decrease following rituximab-based treatment. However, there was no significant difference in IgG levels between the rituximab plus chemotherapy group and the chemotherapy-only group (MD = 1.26, 95% CI: 0.83-1.92, P = 0.28), suggesting that rituximab has a limited effect on humoral immunity (**Figure 7**).

Recurrence rate

Three studies reported recurrence rates. No significant difference was observed between the two groups (OR = 1.80, 95% CI: 0.86-3.76, P = 0.12) (**Figure 8**).

Subgroup analysis

Subgroup analysis showed that rituximab addition improved both EFS and OS in both "Children and Adolescents" and "Children" subgroups across various study designs (**Table 2**).

Publication bias

Funnel plots were used to assess publication bias. In addition, Egger's test (P = 0.130) and Begg's test (P = 0.380) were performed, indicating no significant evidence of publication bias (**Figure 9**).

Discussion

Mature B-cell NHL arises from differentiated B lymphocytes and primarily affects children and adolescents. It is characterized by uncontrolled proliferation of malignant B cells, which can lead to tumor formation and systemic symptoms [10]. Prognosis varies significantly depending on disease stage, histologic subtype, and other prognostic indicators [11]. Rituximab, the first monoclonal antibody approved for anti-tumor therapy, binds specifically to the CD20 antigen on B cells and exerts its effects by complement-dependent cytotoxicity and antibody-dependent cell-mediated cytotoxicity. It is now widely used in the treatment of hematological malignancies and B cell-mediated autoimmune diseases [12, 13].

The results of this meta-analysis demonstrate that the addition of rituximab to chemotherapy significantly improves outcomes in children and adolescents with mature B-cell NHL. The pooled hazard ratios for EFS and OS were 0.40 (95% CI: 0.36-0.45, P < 0.05) and 0.38 (95% CI: 0.34-0.42, P < 0.05), respectively, indicating a substantial reduction in disease progres-

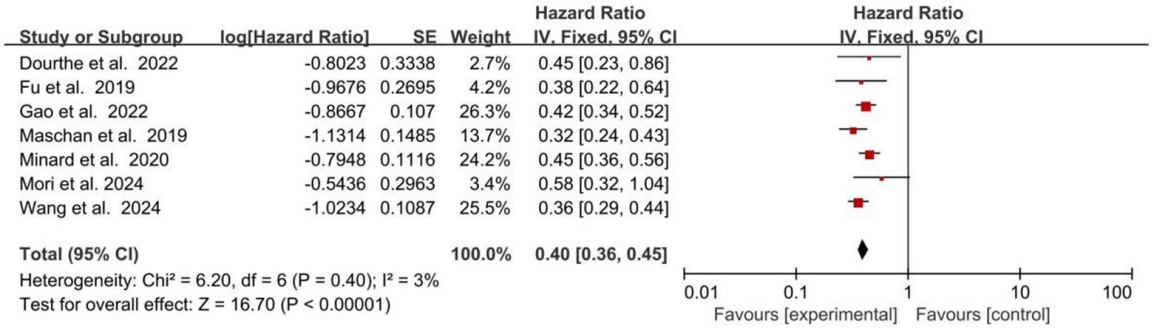

Figure 3. Forest plot showing the event-free survival rates.

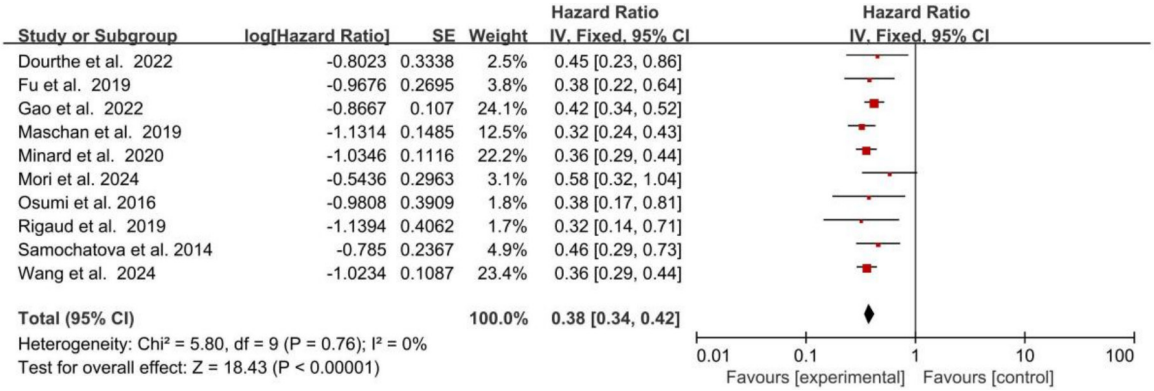

Figure 4. Forest plot showing the overall survival rates.

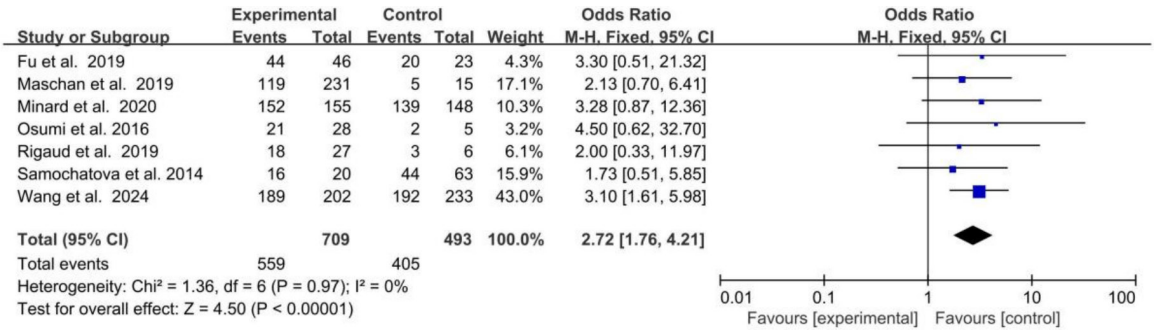

Figure 5. Forest plot showing the complete remission rates.

sion and mortality from rituximab-based therapy.

Consistent findings were reported by Vassilakopoulos et al., who observed improved EFS (HR = 0.50, 95% CI: 0.30-0.80) and OS (HR = 0.60, 95% CI: 0.40-0.90) in adult patients receiving rituximab-based therapy [14]. Similarly, Fujimoto et al. reported HRs of 0.45 for EFS and 0.55 for OS, supporting the efficacy of rituximab in improving long-term outcomes [15]. Other studies have also noted reduced recurrence and mortality rates with the addition of rituximab [16].

The present analysis further revealed that rituximab significantly improves CRR in pediatric and adolescent patients with mature B-cell NHL [17]. Achieving CR is a critical milestone in lymphoma treatment, often associated with favorable long-term prognosis and reduced recurrence risk [18]. This benefit is likely due to rituximab's targeted mechanism of action: it binds to the CD20 antigen on B lymphocytes,

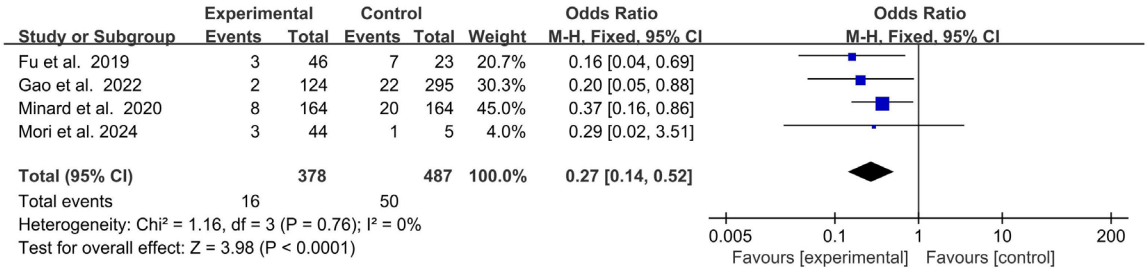

Figure 6. Forest plot showing the incidence of toxic effects.

Figure 7. Forest plot showing the immune reconstitution results.

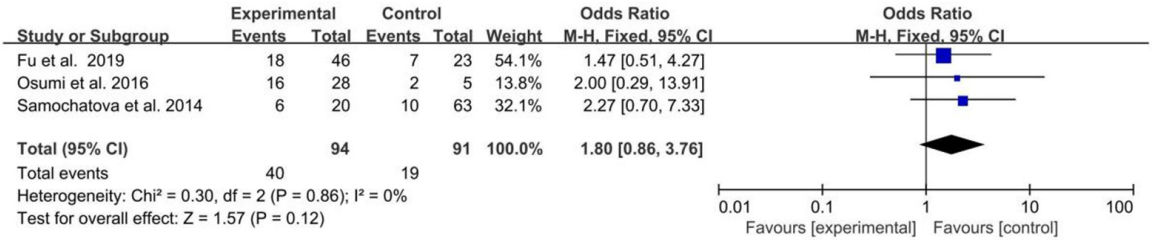

Figure 8. Forest plot showing recurrence rates.

triggering cell lysis through immune-mediated pathways [19]. By enhancing immune responses against lymphoma cells, rituximab contributes to deeper and more sustained remissions [20].

Although the addition of rituximab was associated with an increased incidence of certain adverse effects - most commonly infections, neutropenia, thrombocytopenia, and hepatic dysfunction - the recurrence rates between treatment groups did not differ significantly. This suggests that despite added toxicity, the survival and remission benefits of rituximab may outweigh the risks.

Subgroup analyses by age group and study design showed consistent benefits of rituximab across various populations. Additionally, the absence of publication bias, as evidenced by symmetrical funnel plots and non-significant Egger's and Begg's tests, strengthens the reliability of these findings.

However, several limitations must be acknowledged. First, most included studies originated from western populations, potentially introducing selection bias. Variations in genetic backgrounds, environmental exposures, and healthcare access may influence treatment response. Second, some studies had limited follow-up durations, lacking data on long-term outcomes such as delayed toxicities, secondary malignancies, and quality of life in adulthood. This limits the comprehensive assessment of treatment risks and benefits. Third, heterogeneity in chemotherapy protocols and rituximab dosing across studies may have affected the generalizability of the results.

Future research should focus on large-scale, multicenter, international trials involving ethni-

Table 2. Subgroup analysis by age category and study type for event-free survival and overall survival

Reference	Study Type	Age Category	EFS HR (95% CI)	EFS *P*-value	OS HR (95% CI)	OS *P*-value
Minard et al. [21]	Randomized, phase 3 clinical trial	Children and Adolescents	0.50 (0.30-0.80)	0.04	0.60 (0.40-0.90)	0.02
Mori et al. [24]	Single-arm multicenter test	Children and Adolescents	0.45 (0.25-0.65)	0.03	0.55 (0.35-0.75)	0.04
Gao et al. [25]	Prospective Cohort	Children	0.55 (0.35-0.75)	0.02	0.65 (0.45-0.85)	0.02
Dourthe et al. [26]	Prospective Cohort	Children and Adolescents	0.60 (0.40-0.85)	0.03	0.70 (0.50-0.90)	0.03
Dong et al. [12]	Prospective Cohort	Children	0.65 (0.45-0.85)	0.01	0.75 (0.55-0.95)	0.04
Samochatova et al. [30]	Prospective Cohort	Children and Adolescents	0.70 (0.50-0.90)	0.03	0.80 (0.60-1.00)	0.01
Fu et al. [22]	Retrospective cohort study	Children and Adolescents	0.63 (0.43-0.80)	0.01	0.70 (0.59-0.88)	0.02
Wang et al. [23]	Retrospective cohort study	Children and Adolescents	0.66 (0.44-0.87)	0.02	0.71 (0.58-0.90)	0.05
Rigaud et al. [27]	Retrospective cohort study	Children and Adolescents	0.59 (0.41-0.75)	0.04	0.69 (0.53-0.86)	0.04
Maschan et al. [28]	Retrospective cohort study	Children	0.57 (0.40-0.80)	0.02	0.71 (0.56-0.88)	0.03
Osumi et al. [29]	Retrospective cohort study	Children	0.63 (0.42-0.83)	0.01	0.64 (0.57-0.83)	0.03

EFS: Event-Free Survival; HR: Hazard Ratio; CI: Confidence Interval; OS: Overall Survival.

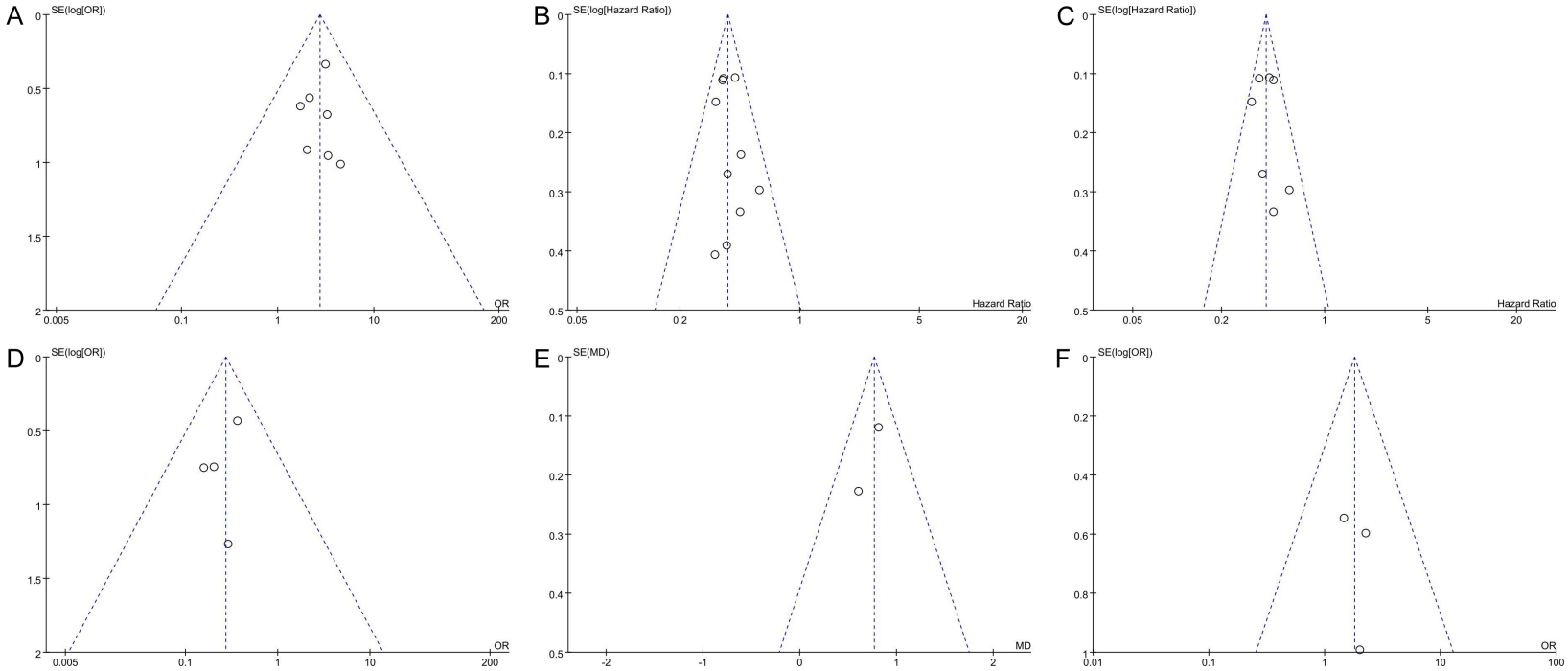

Figure 9. Funnel plots. (A) Event-free survival; (B) Overall survival; (C) Complete remission rate; (D) Toxic effects; (E) Immune reconstitution; (F) Recurrence rate.

cally and geographically diverse populations. Studies with extended follow-up periods are necessary to evaluate long-term safety and efficacy. Furthermore, exploration of rituximab in combination with emerging therapies, such as targeted agents and immunotherapy, may offer additional benefit for pediatric and adolescent patients with mature B-cell NHL.

In conclusion, this meta-analysis supports rituximab combined with chemotherapy as an effective treatment strategy for children and adolescents with mature B-cell NHL. The addition of rituximab significantly improved survival and remission rates, underscoring its vital role in improving outcomes in young patients with mature B-cell NHL.

Acknowledgements

This work was supported by the Medical Science Research Project of Hebei (No. 20241729).

Disclosure of conflict of interest

None.

Address correspondence to: Yan Chen, Department of Pediatrics, The Fourth Hospital of Hebei Medical University, No. 12 Jiankang Road, Chang'an District, Shijiazhuang 050000, Hebei, China. E-mail: 48502307@hebmu.edu.cn

References

[1] Sapkota S and Shaikh H. Non-Hodgkin Lymphoma. StatPearls. Treasure Island (FL) ineligible companies. Disclosure: Hira Shaikh declares no relevant financial relationships with ineligible companies.: StatPearls Publishing Copyright © 2025, StatPearls Publishing LLC.; 2025.

[2] Alexander S, Aupérin A, Bomken S, Csóka M, Kazanowska B, Chiang AK, Andres M, Uyttebroeck A, Burke GAA, Zsiros J, Pillon M, Bollard CM, Mussolin L, Verdu-Amoros J, Neven B, Barkauskas DA, Wheatley K, Patte C, Gross TG and Minard-Colin V; Children's Oncology Group; European Intergroup for Childhood Non-Hodgkin's Lymphoma. Effect of rituximab on immune status in children with mature B-cell non-Hodgkin lymphoma: a prespecified secondary analysis of the Inter-B-NHL Ritux 2010 trial. Lancet Haematol 2023; 10: e445-e457.

[3] Burke GAA, Vinti L, Kabickova E, Beishuizen A, Tacyildiz N, Uyttebroeck A, Kang HJ, Luisi F, Minard-Colin V, Burkhardt B, Tamegnon M, Sun S, Curtis M, Deshpande S, Nottage K, Howes A, Srinivasan S, Bhojwani D, Norris R and Cairo M. Ibrutinib plus RICE or RVICI for relapsed/refractory mature B-cell non-Hodgkin lymphoma in children and young adults: SPARKLE trial. Blood Adv 2023; 7: 602-610.

[4] Falchi L, Vardhana SA and Salles GA. Bispecific antibodies for the treatment of B-cell lymphoma: promises, unknowns, and opportunities. Blood 2023; 141: 467-480.

[5] Bethke M, Varga G, Weinhage T, Sabharwal H, Mellgren K, Randau G, Rolfing M, Wittkowski H, Foell D, Michgehl U and Burkhardt B. Patient parameters and response after administration of rituximab in pediatric mature B-cell non-Hodgkin lymphoma. Pediatr Blood Cancer 2022; 69: e29514.

[6] Lueza B, Aupérin A, Rigaud C, Gross TG, Pillon M, Delgado RF, Uyttebroeck A, Amos Burke GA, Zsíros J, Csóka M, Simonin M, Patte C, Minard-Colin V and Bonastre J. Cost-effectiveness analysis alongside the inter-B-NHL ritux 2010 trial: rituximab in children and adolescents with B cell non-Hodgkin's lymphoma. Eur J Health Econ 2024; 25: 307-317.

[7] Zinzani PL, Wang H, Feng J, Kim TM, Tao R, Zhang H, Fogliatto L, Maluquer Artigal C, Özcan M, Yanez E, Kim WS, Kirtbaya D, Kriachok I, Maciel F, Xue H, Bouabdallah K, Phelps C, Chaturvedi S, Weispfenning A, Morcos PN, Odongo F, Buvaylo V, Childs BH, Dreyling M, Matasar M and Ghione P. CHRONOS-4: phase 3 study of copanlisib plus rituximab-based immunochemotherapy in relapsed indolent B-cell lymphoma. Blood Adv 2024; 8: 4866-4876.

[8] Johnson PC and Abramson JS. Current treatment of Burkitt lymphoma and high-grade B-cell lymphomas. Oncology (Williston Park) 2022; 36: 499-505.

[9] Jeon W, Koh YK, Kang S, Kim H, Koh KN and Im HJ. Clinical characteristics and treatment outcomes of children and adolescents with aggressive mature B-cell lymphoma: a single-center analysis. Blood Res 2022; 57: 41-50.

[10] Gupta S, Alexander S, Pole JD, Sutradhar R, Crump M, Nagamuthu C, Baxter NN and Nathan PC. Superior outcomes with paediatric protocols in adolescents and young adults with aggressive B-cell non-Hodgkin lymphoma. Br J Haematol 2022; 196: 743-752.

[11] Hlavackova E, Krenova Z, Kerekes A, Slanina P and Vlkova M. B cell subsets reconstitution and immunoglobulin levels in children and adolescents with B non-Hodgkin lymphoma after treatment with single anti CD20 agent dose included in chemotherapeutic protocols: sin-

gle center experience and review of the literature. Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub 2024; 168: 167-176.
[12] Dong J, Xu Z, Guo X, Ye F, Fan C, Gao J, Gao Y and Yang L. Effect of rituximab on immune status in children with aggressive mature B-cell lymphoma/leukemia-a prospective study from CCCG-BNHL-2015. Heliyon 2024; 10: e27305.
[13] Alwan AF, Abdulsahib MA, Abbas DD, Abdulsattar SA and Ensaif RT. Efficacy and safety of biosimilar rituximab (ZytuxTM) in newly diagnosed patients with non-Hodgkin lymphoma and chronic lymphocytic leukemia. Hematol Rep 2020; 12: 8296.
[14] Vassilakopoulos TP, Papageorgiou SG, Angelopoulou MK, Chatziioannou S, Prassopoulos V, Karakatsanis S, Arapaki M, Mellios Z, Sachanas S, Kalpadakis C, Katodritou E, Leonidopoulou T, Kotsianidis I, Hatzimichael E, Kotsopoulou M, Dimou M, Variamis E, Boutsis D, Terpos E, Michali E, Karianakis G, Tsirkinidis P, Vadikolia C, Poziopoulos C, Pigaditou A, Vrakidou E, Siakantaris MP, Kyrtsonis MC, Symeonidis A, Anargyrou K, Papaioannou M, Chatziharissi E, Vervessou E, Tsirogianni M, Palassopoulou M, Gainaru G, Mainta C, Tsirigotis P, Assimakopoulou T, Konstantinidou P, Papadaki H, Dimopoulos MA, Pappa V, Karmiris T, Roussou P, Datseris I, Panayiotidis P, Konstantopoulos K, Pangalis GA and Rondogianni P. Positron emission tomography after response to rituximab-CHOP in primary mediastinal large B-cell lymphoma: impact on outcomes and radiotherapy strategies. Ann Hematol 2021; 100: 2279-2292.
[15] Fujimoto A, Hiramoto N, Yamasaki S, Inamoto Y, Ogata M, Sugio Y, Fukuda T, Uchida N, Ikegame K, Matsuoka KI, Shiratori S, Kondo T, Miyamoto T, Eto T, Ichinohe T, Kanda Y, Atsuta Y and Suzuki R; Complication Working Group of the Japan Society for Hematopoietic Cell Transplantation. Low incidence of posttransplant lymphoproliferative disorder after allogeneic stem cell transplantation in patients with lymphoma treated with rituximab. Hematol Oncol 2020; 38: 146-152.
[16] Semary SF, Abdel Rahman H, Elkinaai N, Zaky I, Nagy N, Salem S and Hamoda A. Prognostic factors and treatment outcome of relapsing and refractory pediatric mature B-cell non-Hodgkin lymphoma, children's cancer hospital Egypt experience. J Pediatr Hematol Oncol 2023; 45: e757-e763.
[17] Harker-Murray PD, Pommert L and Barth MJ. Novel therapies potentially available for pediatric B-cell non-Hodgkin lymphoma. J Natl Compr Canc Netw 2020; 18: 1125-1134.
[18] Huang S, Jin L, Yang J, Zhang M, Zhang Y, Peng Y, Duan Y and Zheng H. Optimal dosage of rituximab for children with Burkitt lymphoma. Ann Hematol 2024; 103: 893-903.
[19] Mangogna A, Cox MC, Ruco L, Lopez G, Belmonte B and Di Napoli A. Rituximab plus chemotherapy provides no clinical benefit in a peripheral T-cell lymphoma not otherwise specified with aberrant expression of CD20 and CD79a: a case report and review of the literature. Diagnostics (Basel) 2020; 10: 341.
[20] Nowakowski GS, Yoon DH, Mondello P, Joffe E, Peters A, Fleury I, Greil R, Ku M, Marks R, Kim K, Zinzani PL, Trotman J, Sabatelli L, Waltl EE, Winderlich M, Sporchia A, Kurukulasuriya NC, Cordoba R, Hess G and Salles G. REMIND2: comparative effectiveness of tafasitamab plus lenalidomide versus polatuzumab vedotin/bendamustine/rituximab (pola-BR), CAR-T therapies, and lenalidomide/rituximab (R2) based on real-world data in patients with relapsed/refractory diffuse large B-cell lymphoma. Ann Hematol 2023; 102: 1773-1787.
[21] Minard-Colin V, Aupérin A, Pillon M, Burke GAA, Barkauskas DA, Wheatley K, Delgado RF, Alexander S, Uyttebroeck A, Bollard CM, Zsiros J, Csoka M, Kazanowska B, Chiang AK, Miles RR, Wotherspoon A, Adamson PC, Vassal G, Patte C and Gross TG; European Intergroup for Childhood Non-Hodgkin Lymphoma; Children's Oncology Group. Rituximab for high-risk, mature B-cell non-Hodgkin's lymphoma in children. N Engl J Med 2020; 382: 2207-2219.
[22] Fu Y, Wang H, Zhai X, Qian X, Meng J, Miao H, Zhu X, Yu Y and Lu F. Improved outcome of newly diagnosed childhood mature B-cell lymphoma/leukemia with high tumor burden treated with BFM95-based protocol combining rituximab: a report from Shanghai, China. J Pediatr Hematol Oncol 2019; 41: 170-174.
[23] Wang X, Ding L, Fang Y, Yan J, Gao J, Yang L, Liu A, Lu J, Wang J, Zhang A, Gao Y and Ju X. The prognostic and risk factors for children with high-risk mature B-cell non-Hodgkin's lymphoma: a retrospective multicenter study. Cancer Med 2024; 13: e70309.
[24] Mori T, Osumi T, Kada A, Ohki K, Koga Y, Fukano R, Fujita N, Mitsui T, Mori T, Saito AM, Nakazawa A, Kobayashi R and Sekimizu M. Rituximab with standard LMB chemotherapy in pediatric high-risk mature B-cell non-Hodgkin lymphoma: a report from the JPLSG B-NHL14 trial. Eur J Haematol 2024; 112: 585-593.
[25] Gao YJ, Fang YJ, Gao J, Yan J, Yang LC, Liu AG, Ju XL, Lu J, Han YL, Wang J, Xie M, Guo X and Tang JY. A prospective multicenter study investigating rituximab combined with intensive chemotherapy in newly diagnosed pediatric patients with aggressive mature B cell non-Hodgkin lymphoma (CCCG-BNHL-2015): a

report from the Chinese Children's cancer group. Ann Hematol 2022; 101: 2035-2043.
[26] Dourthe ME, Phulpin A, Auperin A, Bosq J, Couec ML, Dartigues P, Ducassou S, Garnier N, Haouy S, Leblanc T, Leruste A, Paillard C, Rigaud C, Simonin M, Patte C and Minard-Colin V. Rituximab in addition to LMB-based chemotherapy regimen in children and adolescents with primary mediastinal large B-cell lymphoma: results of the French LMB2001 prospective study. Haematologica 2022; 107: 2173-2182.
[27] Rigaud C, Auperin A, Jourdain A, Haouy S, Couec ML, Aladjidi N, Gandemer V, Lambliotte A, Plat G, Landman-Parker J, Michon J, Leblanc T, Patte C and Minard-Colin V. Outcome of relapse in children and adolescents with B-cell non-Hodgkin lymphoma and mature acute leukemia: a report from the French LMB study. Pediatr Blood Cancer 2019; 66: e27873.
[28] Maschan A, Myakova N, Aleinikova O, Abugova Y, Ponomareva N, Belogurova M, Fechina L, Fedorova A, Grigor'eva N, Lebedev V, Nikonova O, Shamardina A, Sharapova G, Smirnova N, Rudneva A, Volchkov E and Samochatova E. Rituximab and reduced-intensity chemotherapy in children and adolescents with mature B-cell lymphoma: interim results for 231 patients enrolled in the second Russian-Belorussian multicentre study B-NHL-2010M. Br J Haematol 2019; 186: 477-483.
[29] Osumi T, Mori T, Fujita N, Saito AM, Nakazawa A, Tsurusawa M and Kobayashi R. Relapsed/refractory pediatric B-cell non-Hodgkin lymphoma treated with rituximab combination therapy: a report from the Japanese pediatric leukemia/lymphoma study group. Pediatr Blood Cancer 2016; 63: 1794-1799.
[30] Samochatova EV, Maschan AA, Shelikhova LN, Myakova NV, Belogurova MB, Khlebnikova OP, Shamardina AV, Ryskal OV, Roumiantseva JV, Konovalov DM, Dubrovina ME and Rumyantsev AG. Therapy of advanced-stage mature B-cell lymphoma and leukemia in children and adolescents with rituximab and reduced intensity induction chemotherapy (B-NHL 2004M protocol): the results of a multicenter study. J Pediatr Hematol Oncol 2014; 36: 395-401.