

Effectiveness and safety of camrelizumab combined with pemetrexed-carboplatin in advanced nonsquamous non-small cell lung cancer (NSCLC): a systematic review and meta-analysis

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<https://doi.org/10.22146/inajbcs.v57i3.Supplement.24251>

ABSTRACT

Submitted: 2025-09-01
Accepted : 2025-09-08

Lung cancer is the second most common malignancy worldwide, with non-small cell lung cancer (NSCLC) comprising about 80% of cases. Platinum-based chemotherapy with third-generation agents such as pemetrexed-carboplatin remains the first-line treatment for nonsquamous advanced NSCLC; however, survival benefits remain limited and immune evasion persists. Camrelizumab (SHR-1210), a humanized anti-PD-1 monoclonal antibody, enhances antitumor immunity by blocking the PD-1/PD-L1 pathway. This systematic review and meta-analysis evaluated the efficacy of camrelizumab combined with chemotherapy in advanced NSCLC, in accordance with PRISMA guidelines. A comprehensive search was performed in PubMed, EBSCO, Cochrane, ScienceDirect, Wiley, and Google Scholar for English-language publications up to July 2025. Study quality was assessed using the Modified Jadad Score, Newcastle–Ottawa Scale, and JBI Checklist. Statistical analyses were conducted with Review Manager 5.4. The main outcomes included overall survival (OS) and progression-free survival (PFS), expressed as hazard ratios (HRs), and objective response rate (ORR) and disease control rate (DCR), expressed as odds ratios (ORs). Six studies were identified; after excluding duplicates, four trials with a total of 332 patients (stage IIIB–IV adenocarcinoma) were analyzed. Camrelizumab-based regimens significantly improved OS (HR = 0.69; 95% CI: 0.55–0.87; $p = 0.002$) and PFS (HR = 0.42; 95% CI: 0.28–0.63; $p < 0.01$) compared with non-camrelizumab regimens. Reported ORR ranged from 40.0% to 58.8%, while DCR was 75.6%–87.7%. Most adverse events were mild (grade ≤ 2) and manageable. Hematologic toxicities included anemia (OR 4.1; $p < 0.00001$) and thrombocytopenia (OR 2.59; $p < 0.00001$), whereas common non-hematologic toxicities included skin reactions (OR 101.42; $p < 0.00001$), fatigue (OR 16.39; $p < 0.00001$), and nausea/vomiting (OR 23.56; $p < 0.00001$). Camrelizumab increases CD8⁺ T-cell infiltration. In combination with carboplatin and pemetrexed, it shows promising efficacy with a tolerable safety profile in advanced nonsquamous NSCLC. Large-scale trials remain necessary to validate long-term outcomes.

ABSTRAK

Kanker paru merupakan keganasan kedua tersering di dunia, dengan *non-small cell lung cancer* (NSCLC) mencakup sekitar 80% kasus. Kemoterapi berbasis platinum dengan agen generasi ketiga seperti pemetrexed-karboplatin masih menjadi terapi lini pertama untuk NSCLC nonskuamosa stadium lanjut; namun, manfaat kelangsungan hidup tetap terbatas dan mekanisme penghindaran imun masih berlangsung. Camrelizumab (SHR-1210), antibodi monoklonal anti-PD-1 yang terhumanisasi, meningkatkan imunitas antitumor dengan memblokir jalur PD-1/PD-L1. Tinjauan sistematis dan meta-analisis ini mengevaluasi efektivitas camrelizumab dikombinasikan dengan kemoterapi pada NSCLC lanjut, sesuai dengan pedoman PRISMA. Pencarian komprehensif dilakukan di PubMed, EBSCO, Cochrane, ScienceDirect, Wiley, dan Google Scholar untuk publikasi berbahasa Inggris hingga Juli 2025. Kualitas studi dinilai menggunakan *Modified Jadad Score*, *Newcastle–Ottawa Scale*, dan *JBI Checklist*. Analisis statistik dilakukan dengan Review Manager 5.4. Luaran utama meliputi *overall survival* (OS) dan *progression-free survival* (PFS), dilaporkan sebagai *hazard ratio* (HR), serta *objective response rate* (ORR)

Keywords:

Camrelizumab;
Pemetrexed/Carboplatin;
Advanced nonsquamous
non-small cell lung
carcinoma;
survival benefits

dan *disease control rate* (DCR), dilaporkan sebagai *odds ratio* (OR). Enam studi teridentifikasi; setelah duplikasi dikeluarkan, empat uji klinis dengan total 332 pasien (adenokarsinoma stadium IIIB–IV) dianalisis. Regimen berbasis camrelizumab secara signifikan meningkatkan OS (HR = 0,69; 95% CI: 0,55–0,87; $p = 0,002$) dan PFS (HR = 0,42; 95% CI: 0,28–0,63; $p < 0,01$) dibandingkan dengan regimen tanpa camrelizumab. ORR yang dilaporkan berkisar antara 40,0% hingga 58,8%, sedangkan DCR 75,6%–87,7%. Sebagian besar efek samping bersifat ringan (derajat ≤ 2) dan dapat ditangani. Toksisitas hematologis meliputi anemia (OR 4,1; $p < 0,00001$) dan trombositopenia (OR 2,59; $p < 0,0001$), sedangkan toksisitas non-hematologis yang umum meliputi reaksi kulit (OR 101,42; $p < 0,00001$), kelelahan (OR 16,39; $p < 0,00001$), serta mual/muntah (OR 23,56; $p < 0,00001$). Camrelizumab diketahui meningkatkan infiltrasi sel T CD8+. Dikombinasikan dengan karboplatin dan pemetrexed, terapi ini menunjukkan efektivitas menjanjikan dengan profil keamanan yang dapat ditoleransi pada NSCLC nonskuamosa stadium lanjut. Uji klinis berskala besar tetap diperlukan untuk memvalidasi manfaat jangka panjang.