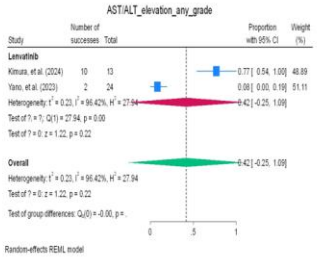
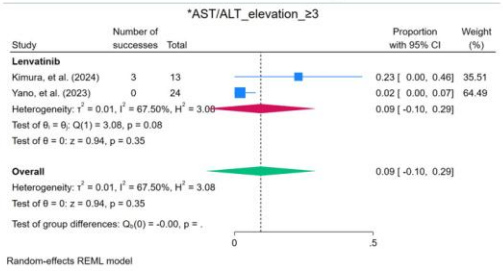
A. Adverse event – AST/ALT elevation, any grade

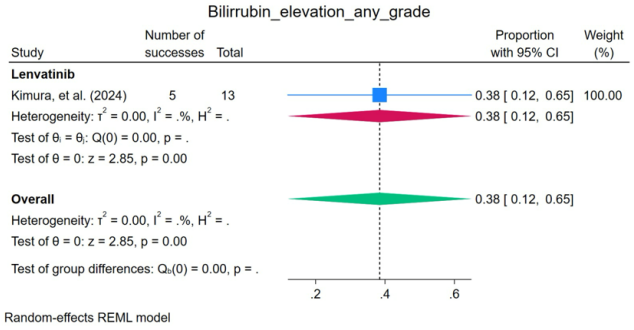


B Adverse event – AST/ALT elevation, ≥ grade 3

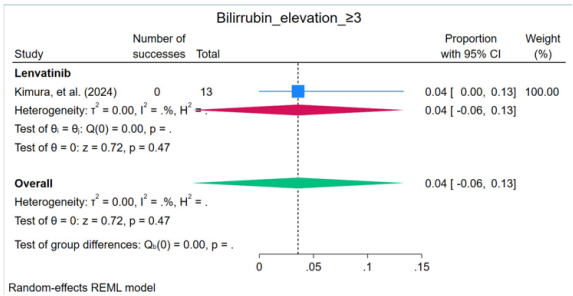


Supplementary Figure 1 Adverse event-AST/ALT elevation. A: Any grade; B: ≥ grade 3.

A. Adverse event – Bilirubin elevation, any grade

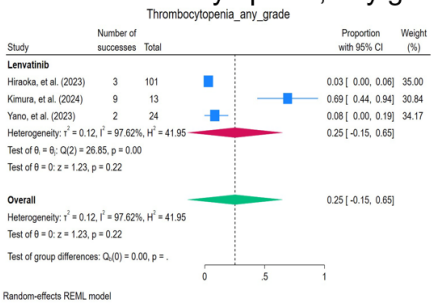


B. Adverse event – Bilirubin elevation, ≥ grade 3

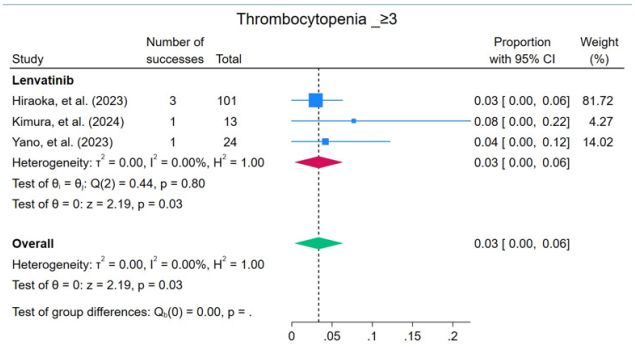


Supplementary Figure 2 Adverse event-bilirubin elevation. A: Any grade; B: ≥ grade 3.

A. Adverse event – Thrombocytopenia, any grade

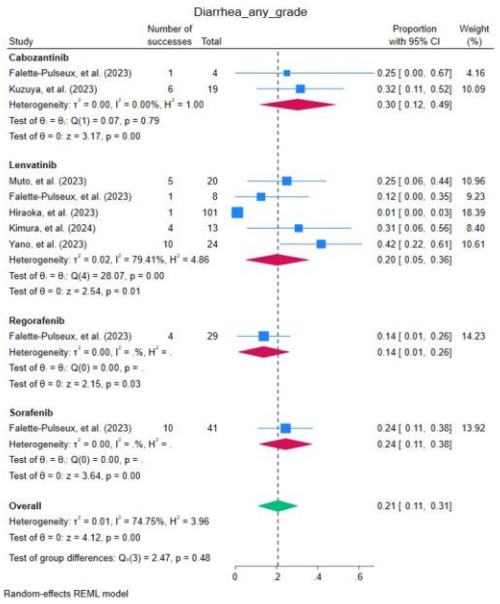


B. Adverse event – Thrombocytopenia, ≥ grade 3

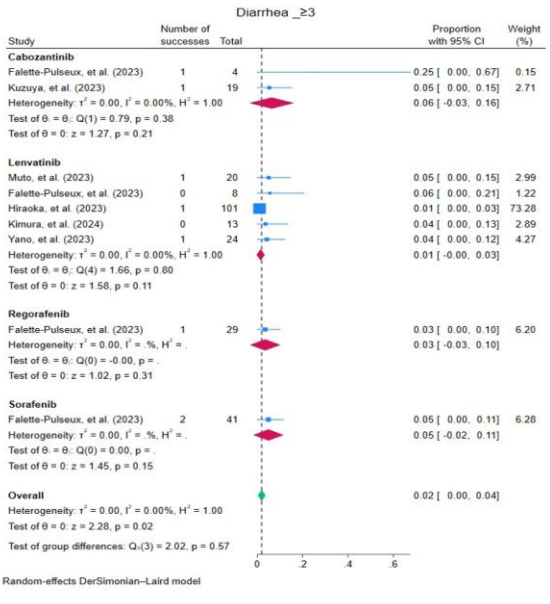


Supplementary Figure 3 Adverse event - thrombocytopenia. A: Any grade; B: ≥ grade 3.

A. Adverse event – Diarrhea, any grade

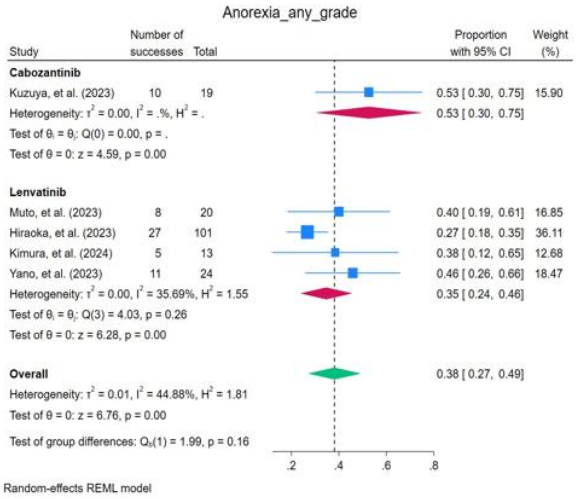


B. Adverse event – Diarrhea, ≥ grade 3

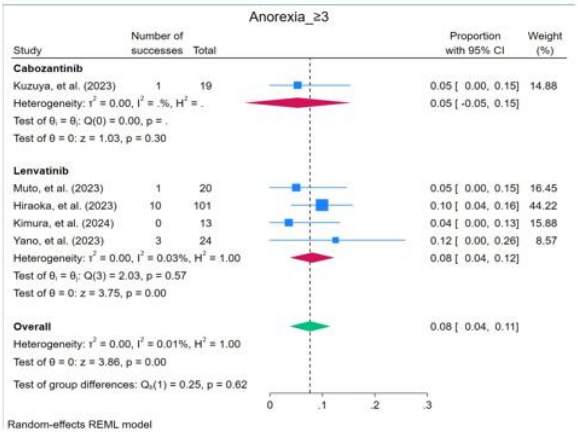


Supplementary Figure 4 Adverse event - diarrhea. A: Any grade; B: ≥ grade 3.

A. Adverse event – Anorexia, any grade

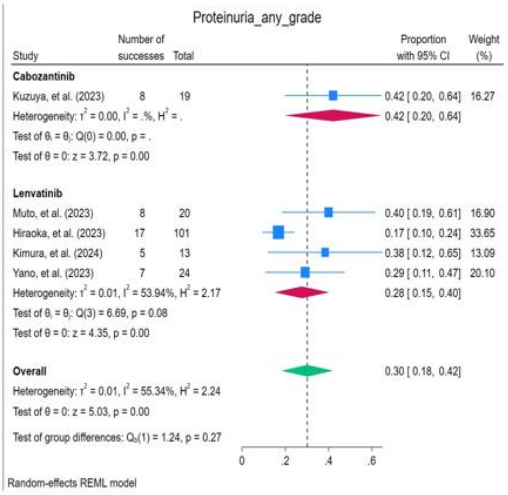


B. Adverse event – Anorexia, ≥ grade 3

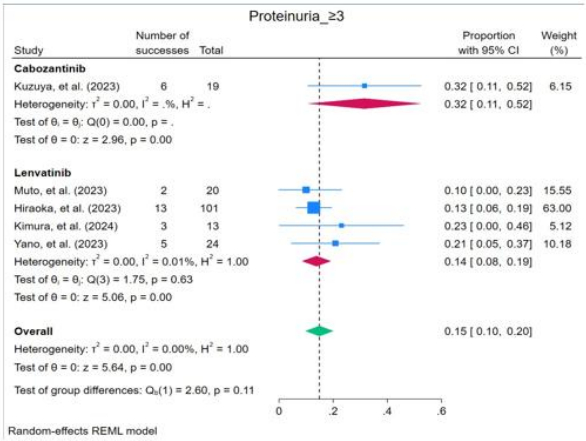


Supplementary Figure 5 Adverse event - anorexia. A: Any grade; B: ≥ grade 3.

A. Adverse event – Proteinuria, any grade

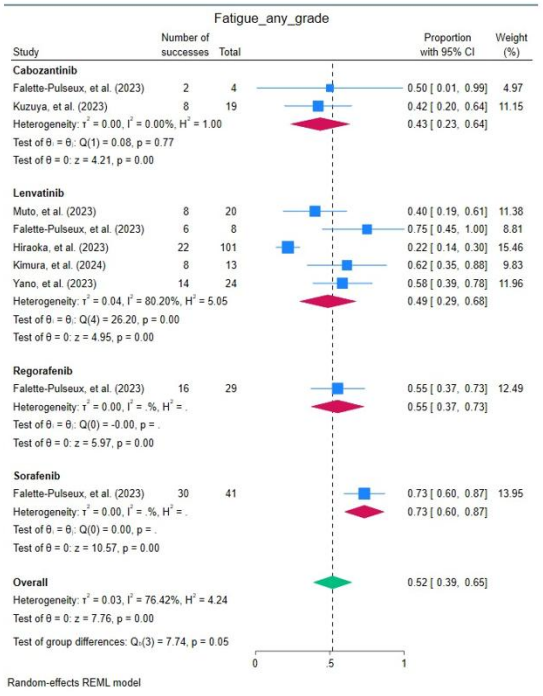


B. Adverse event – Proteinuria, ≥ grade 3

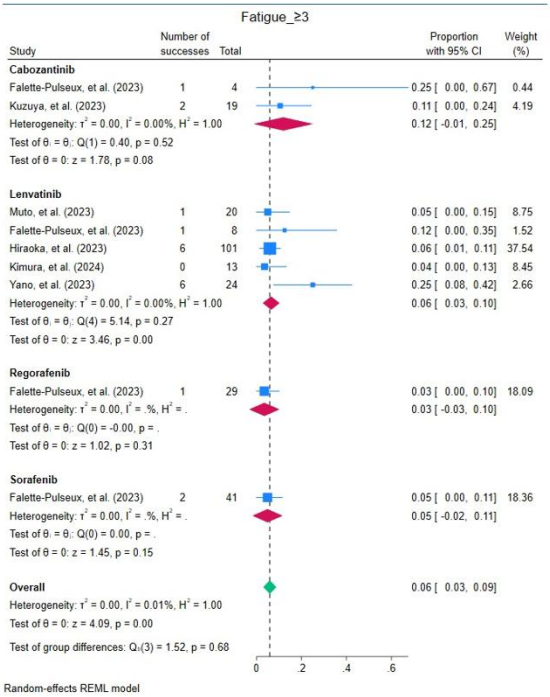


Supplementary Figure 6 Adverse event - proteinuria. A: Any grade; B: ≥ grade 3.

A. Adverse event – Fatigue, any grade

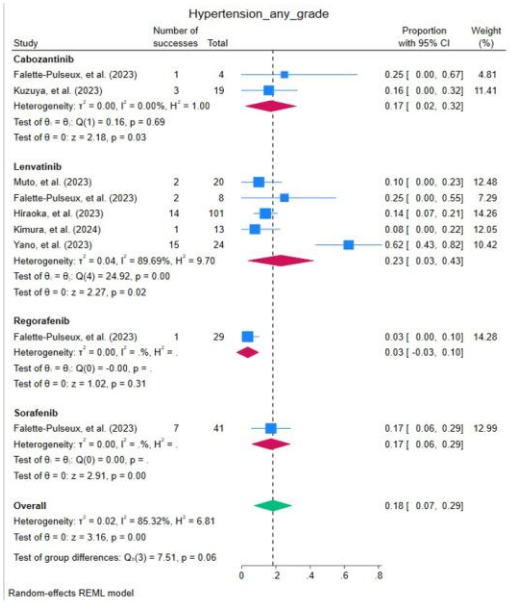


B. Adverse event – Fatigue, ≥ grade 3

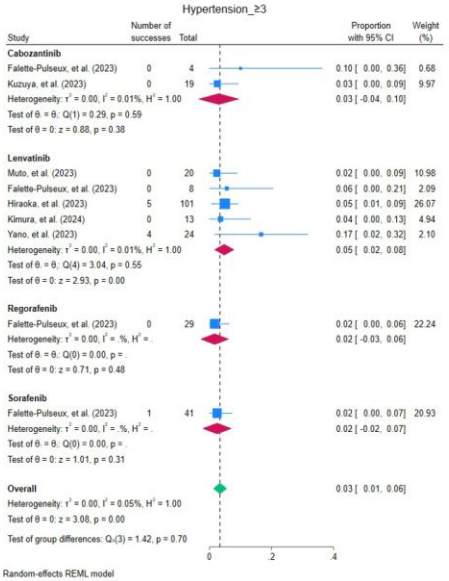


Supplementary Figure 7 Adverse event - fatigue. A: Any grade; B: ≥ grade 3.

A. Adverse event – Hypertension, any grade

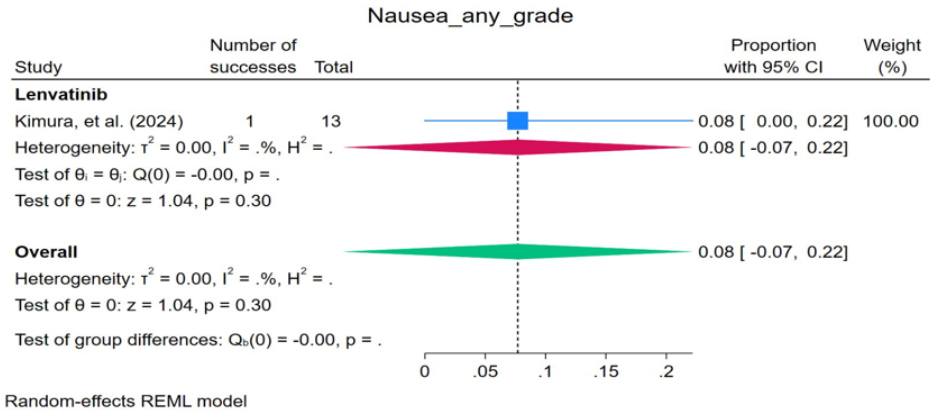


B. Adverse event – Hypertension, ≥ grade 3

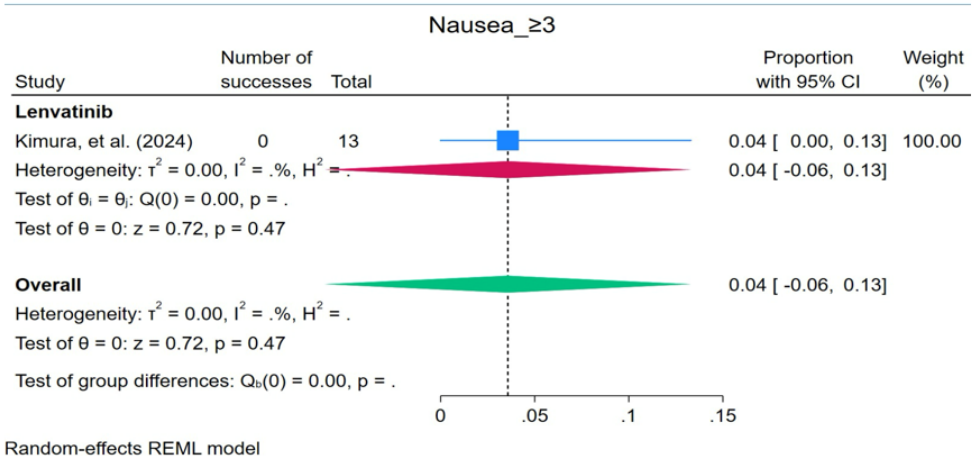


Supplementary Figure 8 Adverse event - hypertension. A: Any grade; B: ≥ grade 3.

A. Adverse event – Nausea, any grade

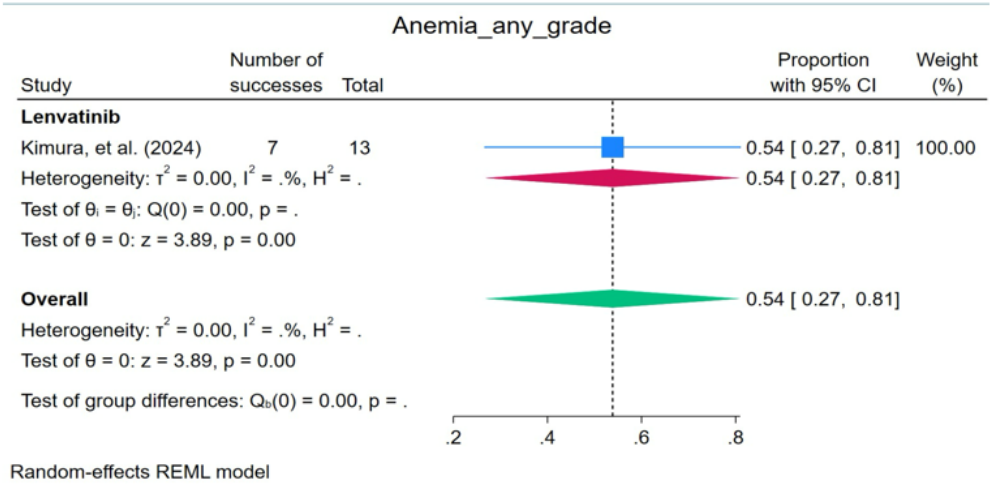


B. Adverse event – Nausea, ≥ grade 3

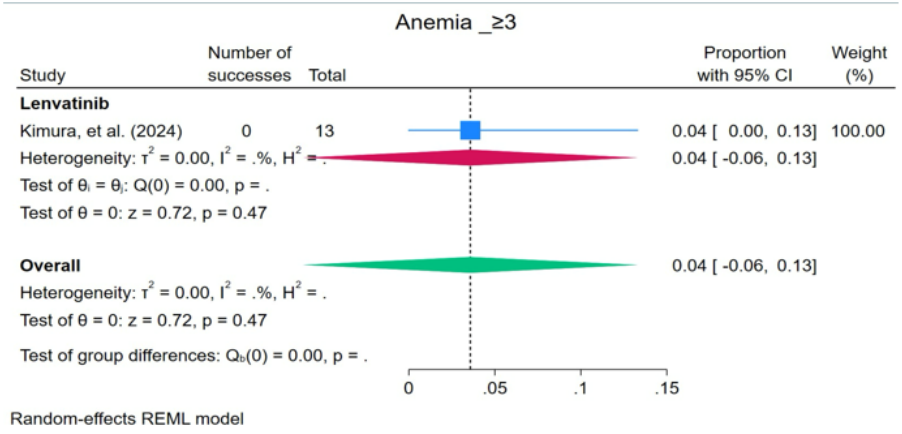


Supplementary Figure 9 Adverse event - nausea. A: Any grade; B: ≥ grade 3.

A. Adverse event – Anemia, any grade

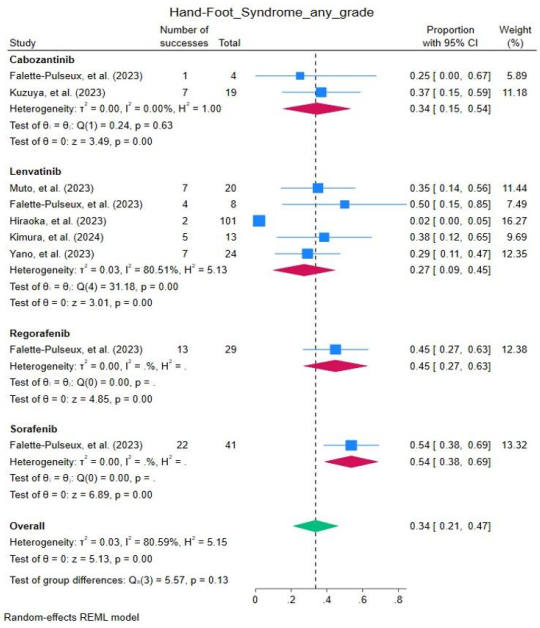


B. Adverse event – Anemia, ≥ grade 3

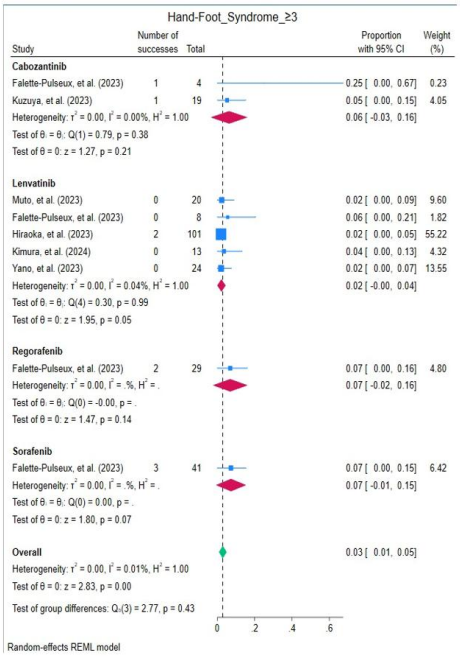


Supplementary Figure 10 Adverse event - anemia. A: Any grade; B: ≥ grade 3.

A. Adverse event – Hand–foot syndrome, any grade

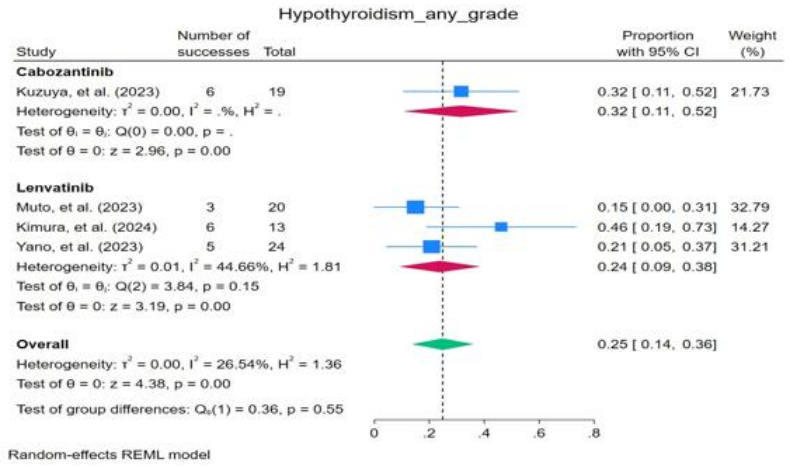


B. Adverse event – Hand–foot syndrome, ≥ grade 3

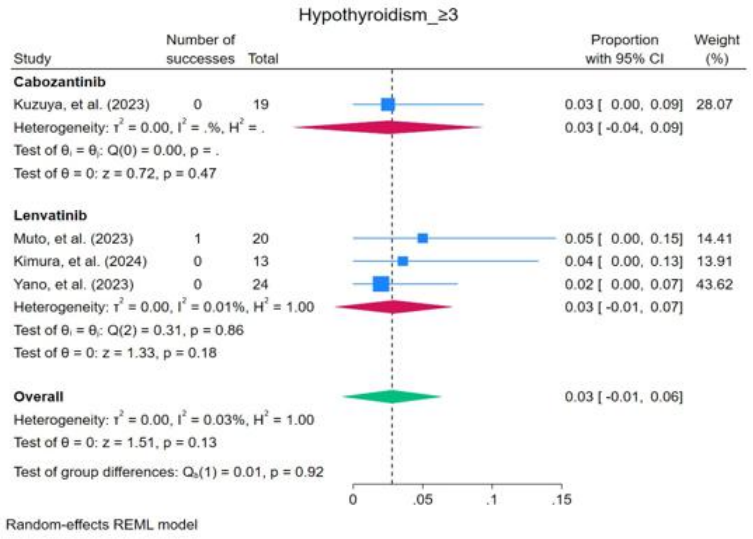


Supplementary Figure 11 Adverse event - hand-foot syndrome. A: Any grade; B: ≥ grade 3.

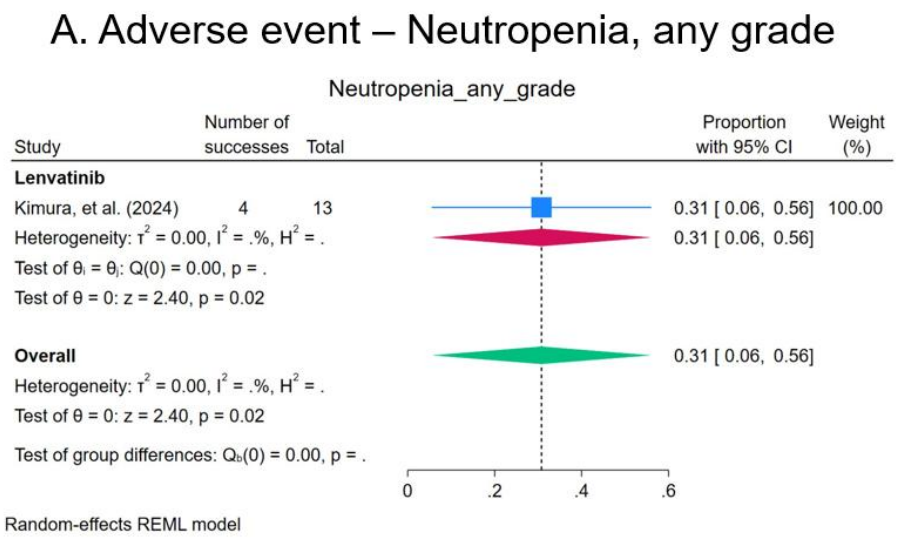
A. Adverse event – Hypothyroidism, any grade

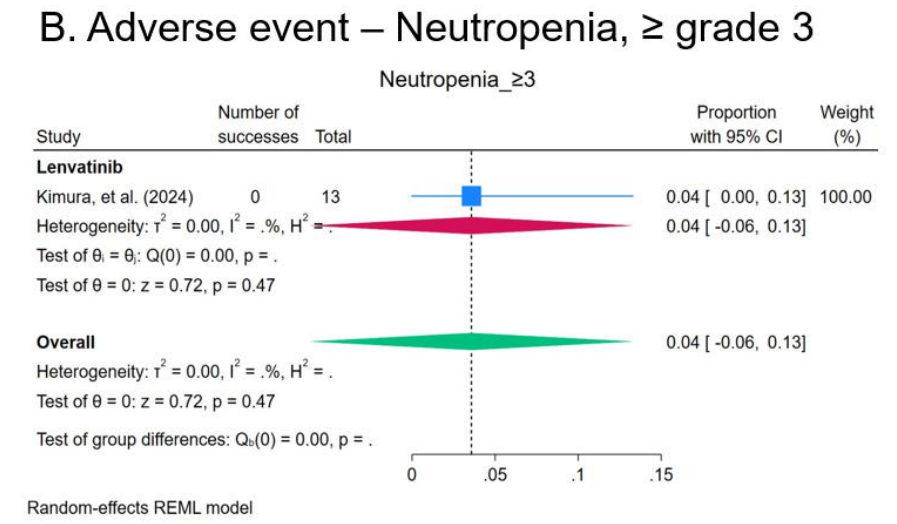


B. Adverse event – Hypothyroidism, ≥ grade 3



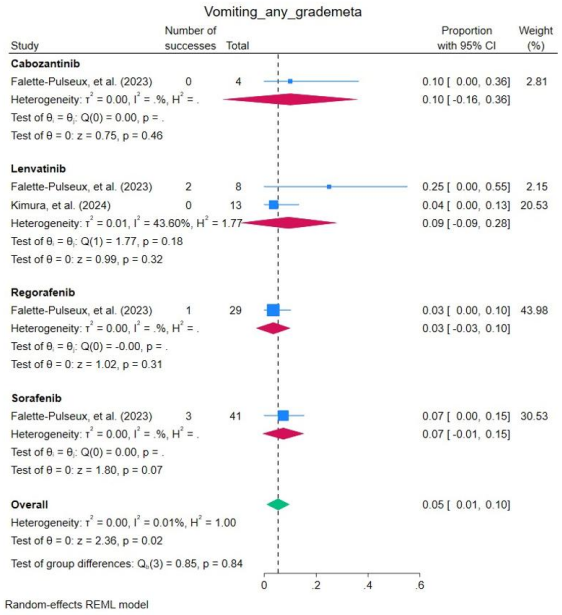
Supplementary Figure 12 Adverse event - hypothyroidism. A: Any grade; B: ≥ grade 3.



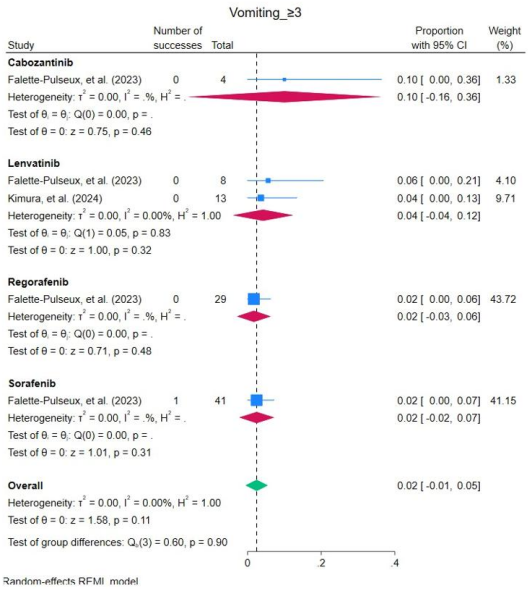


Supplementary Figure 13 Adverse event - neutropenia. A: Any grade; B: ≥ grade 3.

A. Adverse event – Vomiting, any grade

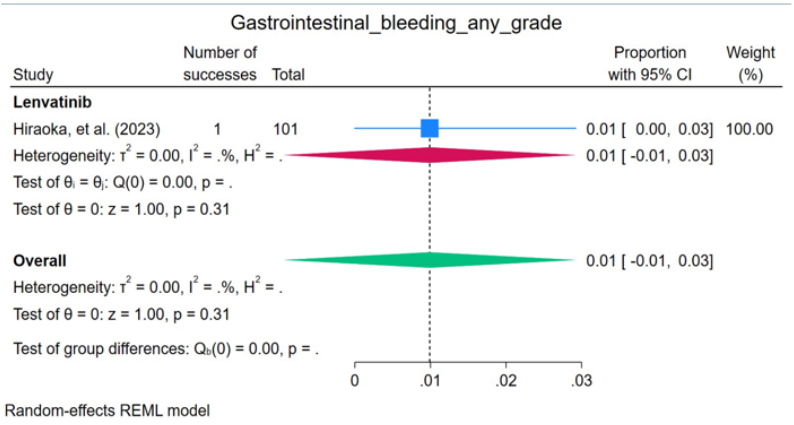


B. Adverse event – Vomiting, ≥ grade 3

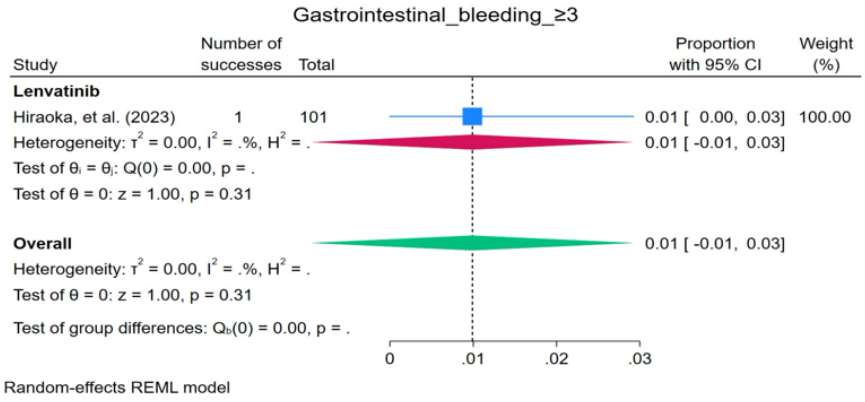


Supplementary Figure 14 Adverse event - vomiting. A: Any grade; B: ≥ grade 3.

A. Adverse event – Gastrointestinal bleeding, any grade

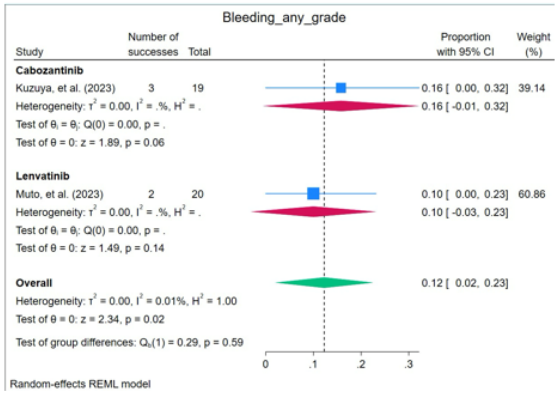


B. Adverse event – Gastrointestinal bleeding, ≥ grade 3

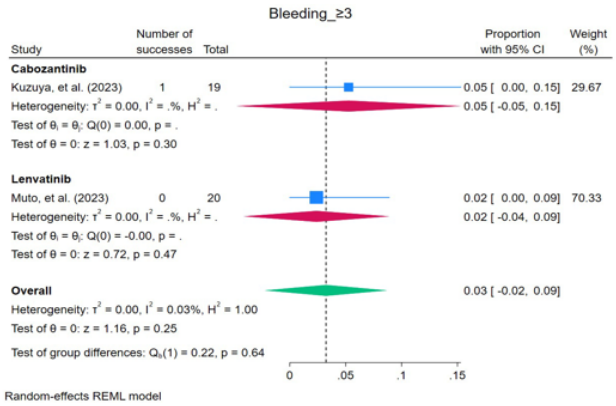


Supplementary Figure 15 Adverse event - gastrointestinal bleeding. A: Any grade; B: ≥ grade 3.

A. Adverse event –Non–gastrointestinal bleeding, any grade

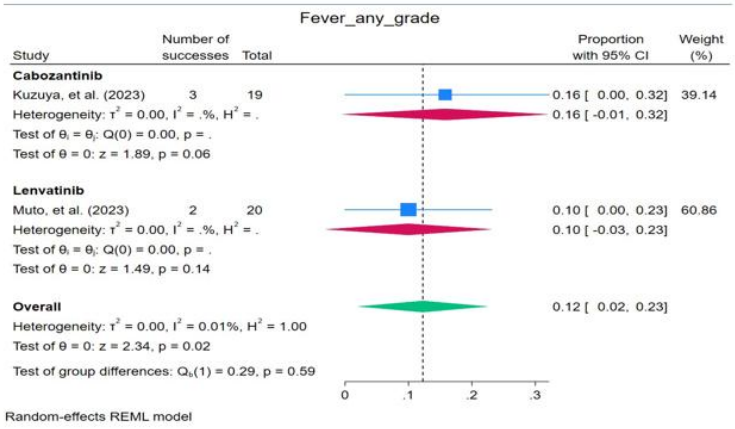


B. Adverse event – Non–gastrointestinal bleeding, ≥ grade 3

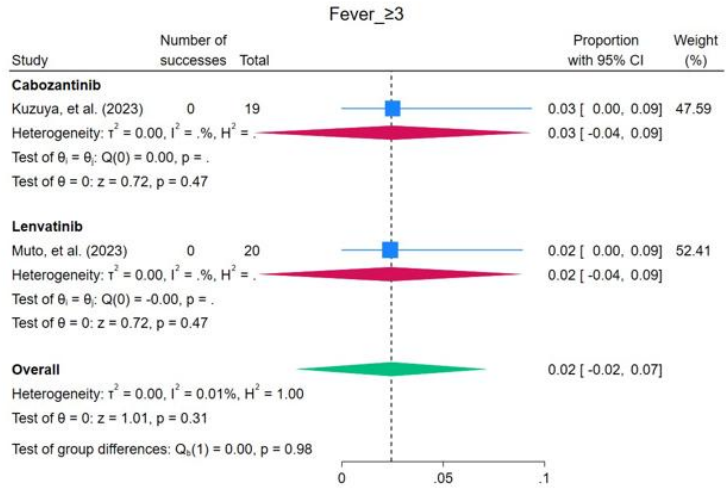


Supplementary Figure 16 Adverse event - non-gastrointestinal bleeding. A: Any grade; B: ≥ grade 3.

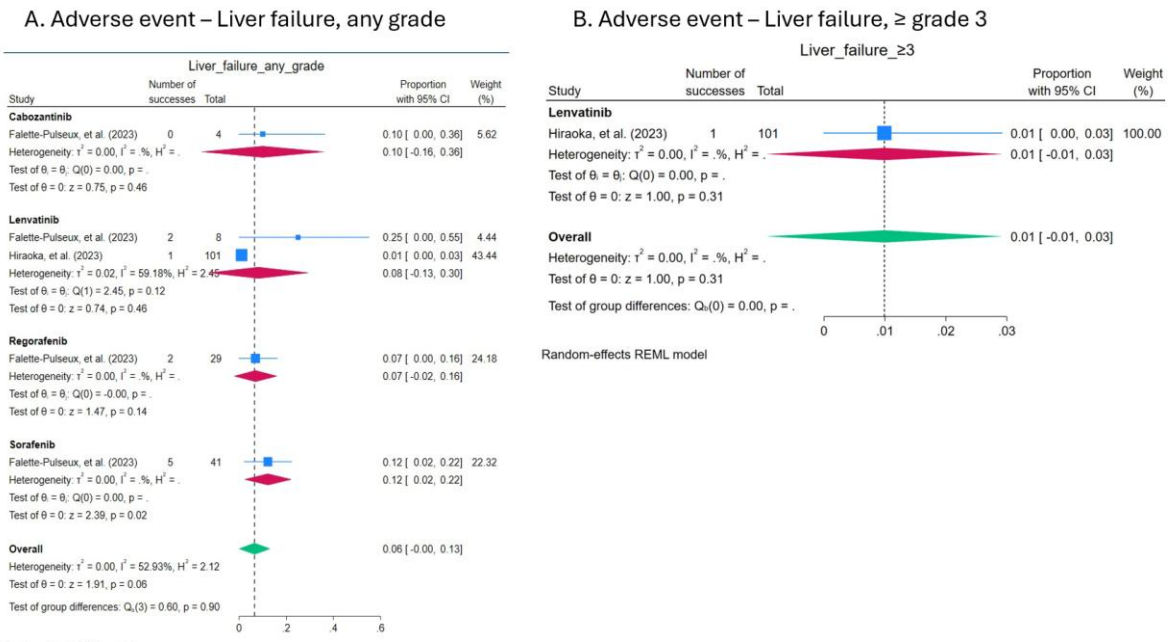
A. Adverse event – Fever, any grade



B. Adverse event – Fever, ≥ grade 3

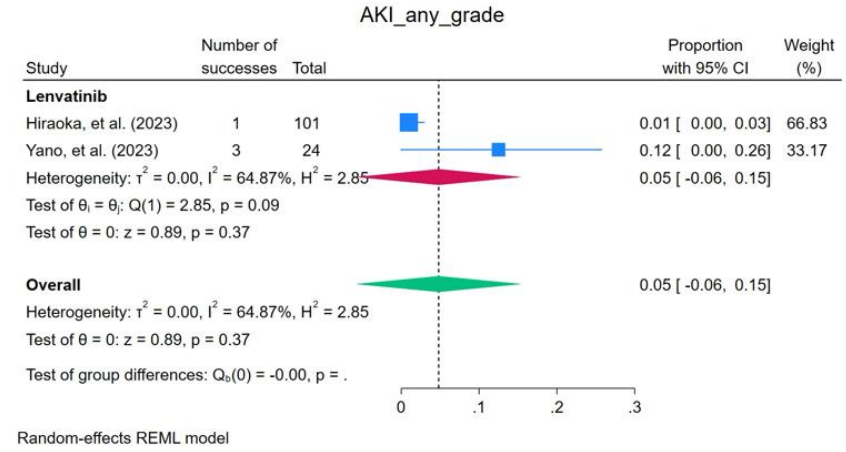


Supplementary Figure 17 Adverse event - fever. A: Any grade; B: ≥ grade 3.

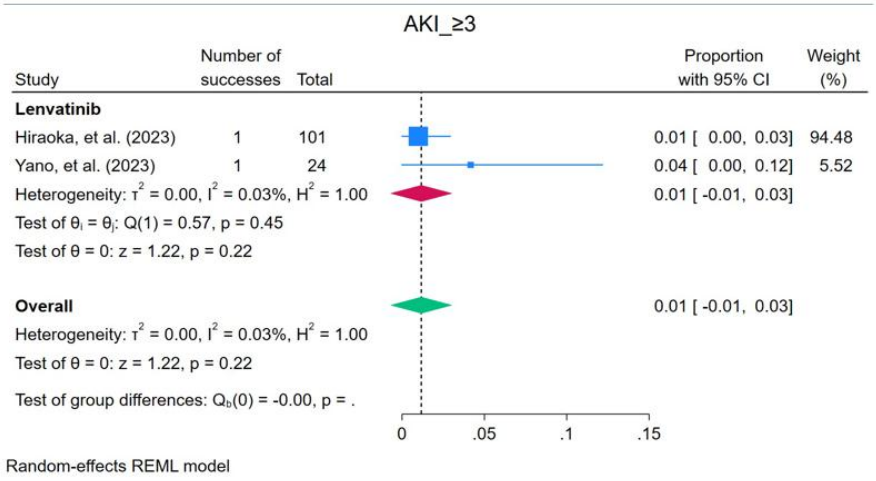


Supplementary Figure 18 Adverse event - liver failure. A: Any grade; B: ≥ grade 3.

A. Adverse event – Acute kidney injury, any grade

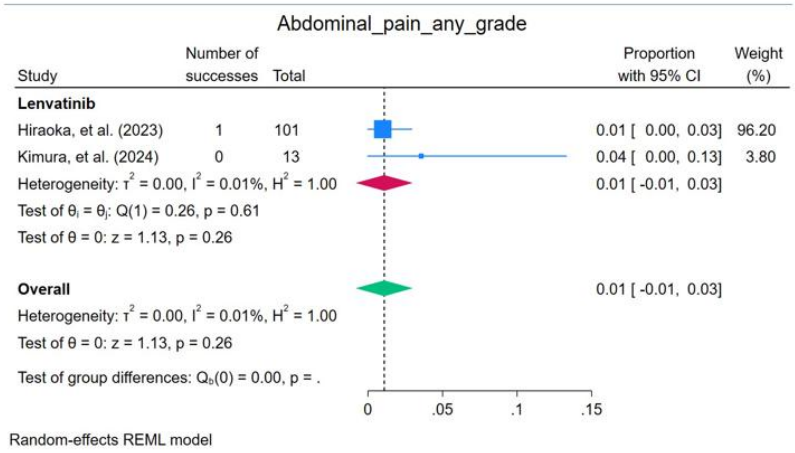


B. Adverse event – Acute kidney injury, ≥ grade 3

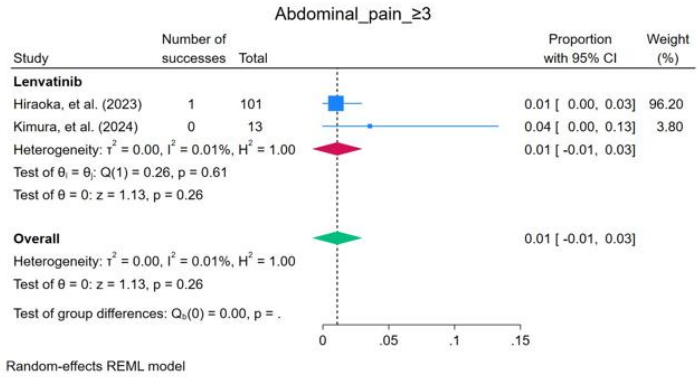


Supplementary Figure 19 Adverse event - acute kidney injury. A: Any grade; B: ≥ grade 3.

A. Adverse event – Abdominal pain, any grade

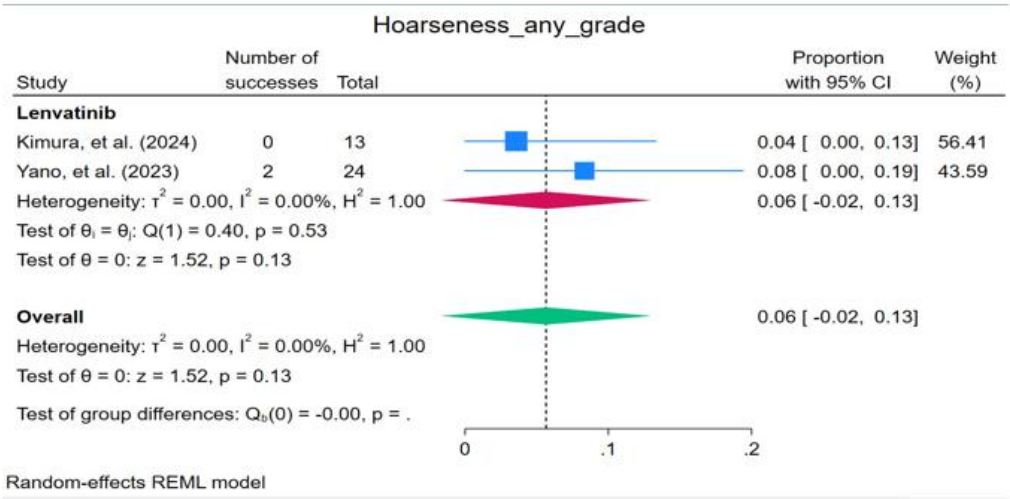


B. Adverse event – Abdominal pain, ≥ grade 3

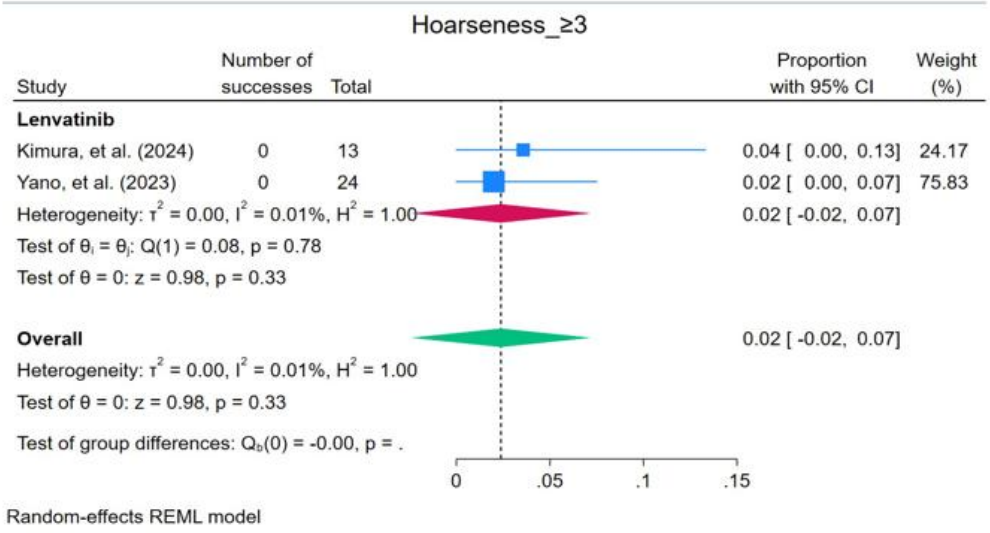


Supplementary Figure 20 Adverse event - abdominal pain. A: Any grade; B: ≥ grade 3.

A. Adverse event – Hoarseness, any grade



B. Adverse event – Hoarseness, ≥ grade 3



Supplementary Figure 21 Adverse event - hoarseness. A: Any grade; B: ≥ grade 3.

Supplementary Table 1 Search Strategy

Database(s)	Search strategy
PubMed, Scopus, Web of Science	("Hepatocellular Carcinoma" OR "Liver Cancer" OR "Hepatocellular Cancer" OR HCC) AND ("Atezolizumab plus Bevacizumab" OR "Atezolizumab/Bevacizumab" OR "Atezolizumab-Bevacizumab" OR "Atezolizumab and Bevacizumab" OR "Bevacizumab/Atezolizumab") AND ("Tyrosine Kinase Inhibitors" OR TKI OR "Kinase inhibitors" OR Regorafenib OR Cabozantinib OR Lenvatinib OR Sorafenib)
Cochrane Library	("Hepatocellular Carcinoma" OR "Liver Cancer" OR "Hepatocellular Cancer" OR HCC) AND ("Atezolizumab plus Bevacizumab" OR "Atezolizumab/Bevacizumab" OR "Atezolizumab-Bevacizumab" OR "Atezolizumab and Bevacizumab" OR "Bevacizumab/Atezolizumab") AND ("Tyrosine Kinase Inhibitors" OR "TKI" OR "Kinase inhibitors" OR "Regorafenib" OR "Cabozantinib" OR "Lenvatinib" OR "Sorafenib")

Supplementary Table 2 Methodological Index for Non-randomized Studies Scoring Criteria

Item	Description	Score definition
1. Clearly stated aim	The research question should be precise and relevant based on existing literature.	0: Aim not reported1: Aim reported but not precise2: Aim is precise
2. Inclusion of consecutive patients	All eligible patients during the study period should be included, or exclusions must be justified.	0: Inclusion not reported1: Inclusion reported but not consecutive2: Consecutive inclusion or reasons for exclusion reported
3. Prospective collection of data	Data should be collected using a protocol established before study initiation.	0: Timing of protocol relative to data collection not reported1: Timing reported but not prospective2: Prospective data collection
4. Endpoints appropriate to study aim	Endpoints should directly address the study objective, be clearly defined, and assessed using intention-to-treat.	0: Endpoints not reported1: Endpoints reported but irrelevant or insufficiently specified2: Endpoints relevant and clearly defined
5. Unbiased assessment of study endpoints	Objective endpoints should be assessed blindly; subjective endpoints require double-blinding or justification for lack thereof.	0: Blinding not reported or no blinding1: Blinding reported but inadequate or justification provided2: Appropriate blinding (objective and subjective endpoints)
6. Follow-up period appropriate to study aim	Follow-up duration must be sufficient to assess the main endpoint and adverse events.	0: Follow-up not reported1: Follow-up reported but < 2 years2: Mean follow-up ≥ 2 years

7. Loss to follow-up < 5%	Loss to follow-up must be minimal and should not exceed the rate of the main endpoint.	0: Loss to follow-up not reported or ≥ 5% without justification1: Loss to follow-up < 5% but insufficient detail2: Loss to follow-up < 5% with adequate reporting
8. Prospective calculation of study size	Study size should be calculated prospectively to ensure adequate power.	0: No prospective sample size calculation1: Sample size calculation mentioned but inadequate2: Adequate prospective sample size calculation