



# Endoscopic ultrasound (EUS) guided therapies for primary and secondary prophylaxis in gastric varices – An updated systematic review & meta-analysis

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## BACKGROUND

- Gastric varices (GV) are associated with higher risk of uncontrolled bleeding and death when compared to esophageal varices. While endoscopic glue injection therapy has been traditionally used for secondary prophylaxis in GV, data regarding primary prophylaxis continues to emerge.
- Recently, endoscopic ultrasound (EUS) guided therapies have been employed in GV bleeding.

## METHODS

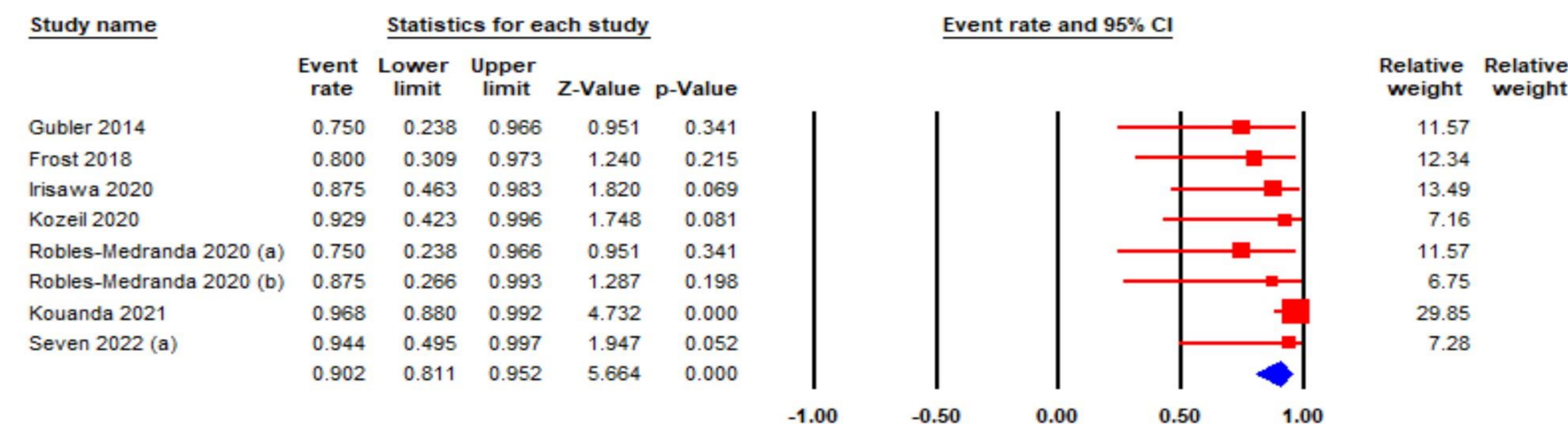
- We conducted a comprehensive search of several major databases from inception to June 2022. Primary goals were to estimate the pooled rates of treatment efficacy, GV obliteration, GV recurrence, and re-bleeding with EUS guided therapy in primary and secondary prophylaxis. Overall adverse events, and technical failures were assessed.
- Random-effects model was used for our meta-analysis and heterogeneity was assessed using the I<sup>2</sup> statistics.

## OUTCOMES ASSESSED

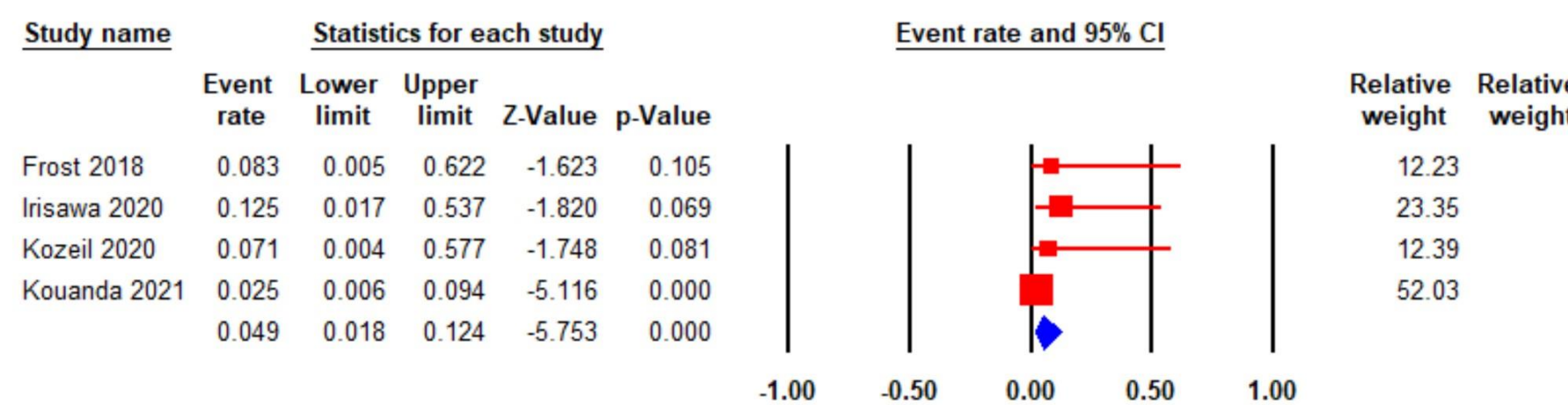
- For primary prophylaxis, pooled rates of –**
  - Complete variceal obliteration, as confirmed by follow up endoscopic and EUS examination.
  - Post therapy GV bleeding
  - Technical failures, defined as failure to successfully perform EUS guided therapy
- For secondary prophylaxis, pooled rates of –**
  - Treatment efficacy, defined as complete cessation of bleeding
  - Complete variceal obliteration, as confirmed by follow up endoscopic and EUS examination.
  - GV re-bleeding, including early and late rebleeding
  - GV recurrence on follow up
  - Technical failures, defined as failure to successfully perform EUS guided therapy

## META-ANALYSIS OUTCOMES

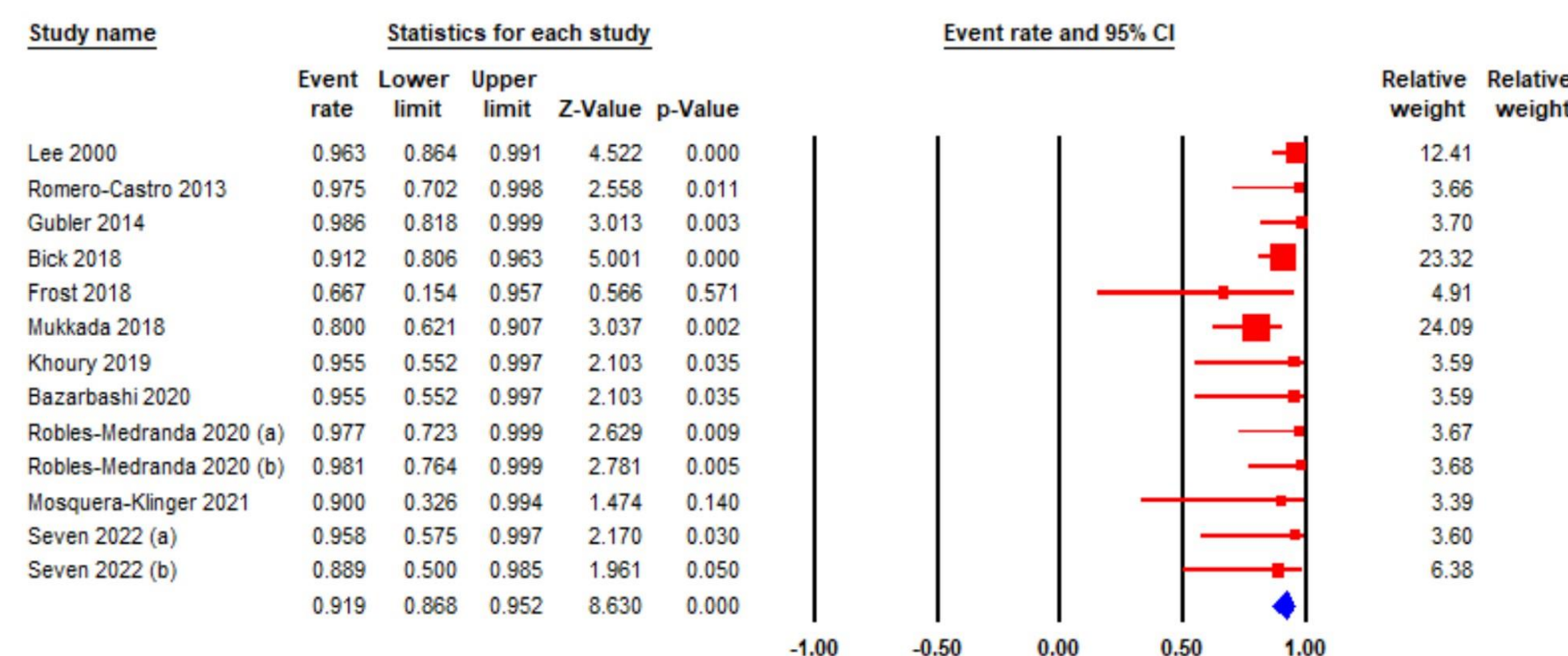
### GV obliteration - primary prophylaxis



### Post therapy bleeding - primary prophylaxis



### Treatment efficacy - secondary prophylaxis



## RESULTS

- Eighteen studies (comprised of 27 cohorts) with 604 patients were included in our final analysis.
- EUS guided therapies for primary GV prophylaxis were performed in 162 patients, whereas secondary prophylaxis for active and recent bleeding from GV was performed in 442 patients.
- 47 patients with GOV1, 190 patients with GOV2, 297 with IGV1 and 6 patients with IGV2.
- In primary prophylaxis, pooled rate of GV obliteration was 90.2% (CI 81.1–95.2; I<sup>2</sup> 0). With combination EUS-glue and coil therapy, the rate was 95.4% (CI 86.7–98.5; I<sup>2</sup> 0). Fig 1.
- Pooled rate of post therapy GV bleeding was 4.9% (CI 1.8–12.4; I<sup>2</sup> 0). Fig 2.
- In secondary prophylaxis, pooled rate of treatment efficacy was 91.9% (CI 86.8–95.2; I<sup>2</sup> 12). Fig 3. With EUS-glue, EUS-coil and combination EUS-glue and coil, the rates were 92% (CI 80.7–96.9; I<sup>2</sup> 60), 95.5% (CI 83.6–98.9; I<sup>2</sup> 0) and 88.8% (CI 79.8–94.1; I<sup>2</sup> 16), respectively.
- Pooled rate of GV obliteration was 84% (CI 71.5–91.2; I<sup>2</sup> 74). With EUS-glue, EUS-coil and combination EUS-glue and coil, the rates were 84.6% (CI 75.9–90.6; I<sup>2</sup> 31), 92.3% (CI 81.1–97.1; I<sup>2</sup> 0) and 84.5% (CI 50.8–96.7; I<sup>2</sup> 75), respectively.
- Pooled rates of GV re-bleeding and recurrence were 18.1% (CI 13.1–24.3; I<sup>2</sup> 16) and 20.6% (CI 9.3–39.5; I<sup>2</sup> 66), respectively.

## CONCLUSION

- Our analysis shows that EUS-guided therapy for gastric varices is technically feasible and clinically successful in both primary and secondary prophylaxis of GV.