

Severity of Acute Pancreatitis in COVID-19 Infection. A Systematic Review and Meta Analysis

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Objectives

Our objective was to review the severity of acute pancreatitis in patients with and without coexisting COVID-19 infection.

Background

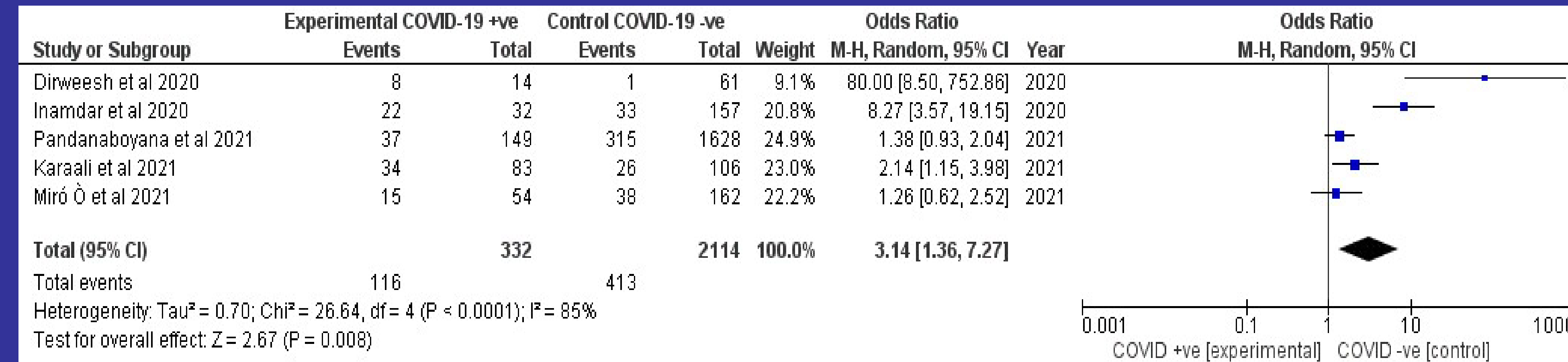
There is increasing literature mentioning severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection (COVID-19 infection) causing acute pancreatitis (AP). Pancreatic involvement has been hypothesized to be mediated by the expression of angiotensin-converting enzyme 2 (ACE2) receptors on the pancreatic acinar cells which are the main receptors of SARS-CoV-2 rendering the pancreas a potential target for SARS-CoV-2.

Methods

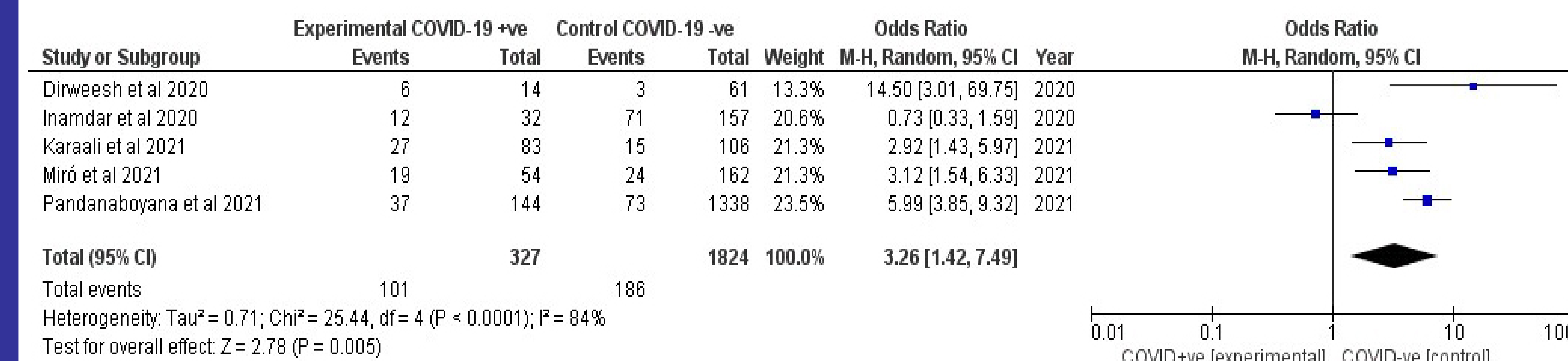
We performed a systematic review and meta-analysis according to PRISMA and Cochrane guidelines. We searched for articles in PubMed (MEDLINE), Cochrane library and clinicaltrials.gov and studies comparing the outcomes of AP amongst patients with and without COVID-19 were included. The initial search strategy yielded 264 articles. 5 articles met the inclusion criteria and were included in the meta-analysis with a total population of 2,608 patients. Our outcomes were mean age of occurrence of acute pancreatitis, Charlson Comorbidity Index (CCI), idiopathic etiology of acute pancreatitis, severity of acute pancreatitis, incidence of necrotizing pancreatitis, need for ICU admission and mortality between the two cohorts.

Results

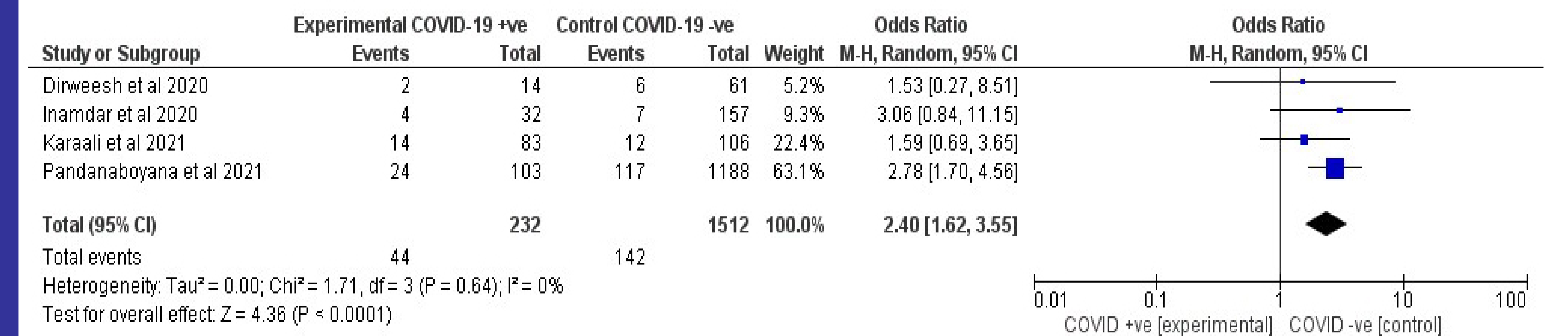
Our results showed that AP in patients with COVID-19 infection is more likely to have an **idiopathic etiology** (OR 3.14, 95% CI 1.36–7.27), **be more severe** (OR 3.26, 95% CI 1.47–7.49), **have a higher incidence of pancreatic necrosis** (OR 2.40, 95% CI 1.62–3.55), **require ICU admission** (OR 4.28, 95% CI 2.88 – 6.37) and **have a higher mortality** (OR 5.75, 95% CI 3.62 - 9.14) than in patients without COVID-19 infection.



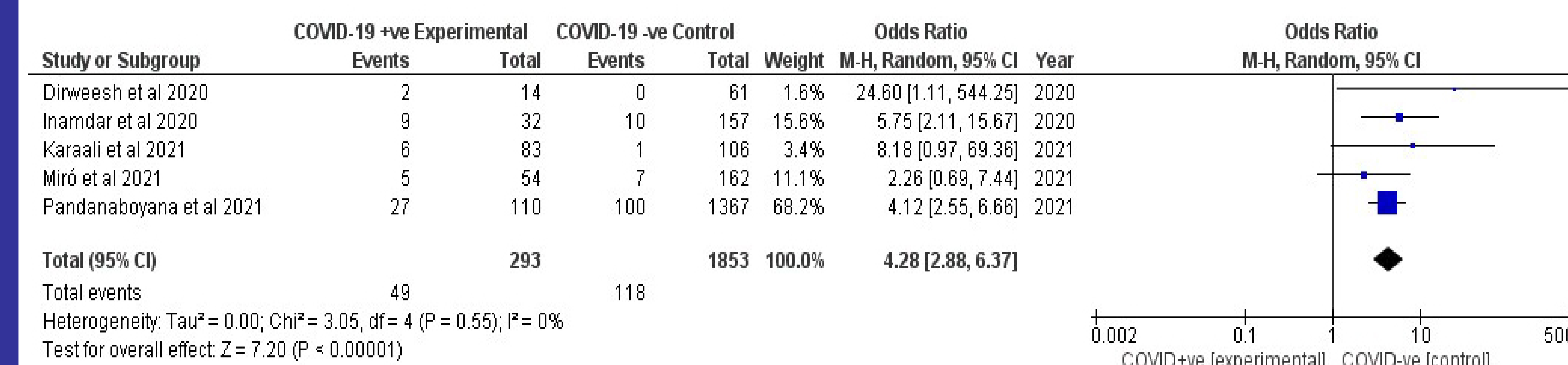
Forest Plot for Idiopathic etiology of Acute Pancreatitis in patients with and without COVID-19 infection



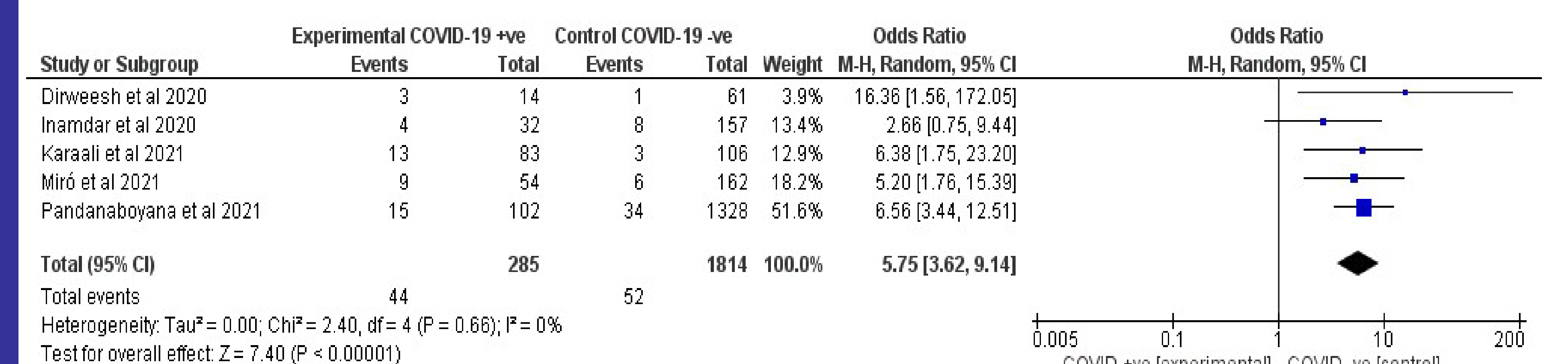
Forest Plot for Severity of Acute Pancreatitis in patients with and without COVID-19 Infection



Forest plot for incidence of necrotizing pancreatitis in patients with and without COVID-19 infection

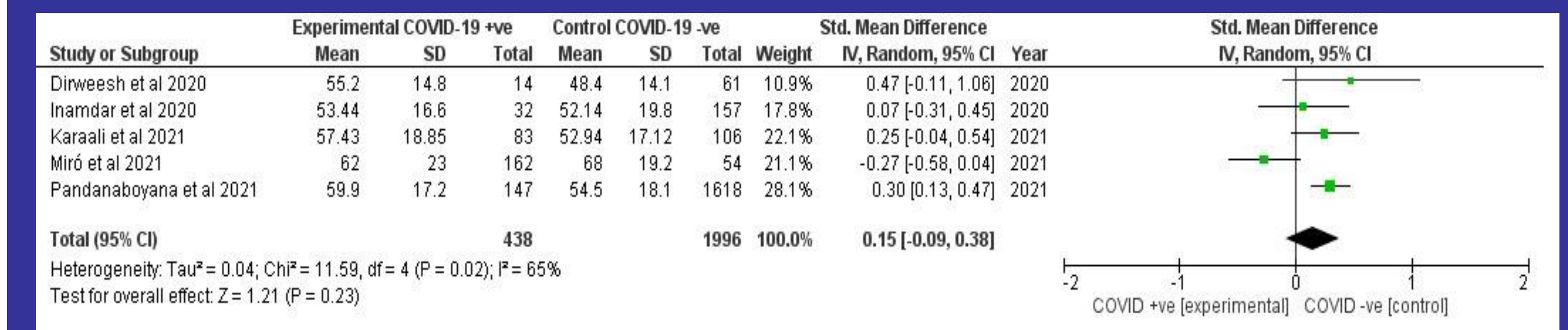


Forest Plot for ICU admission in patients with and without COVID-19 infection

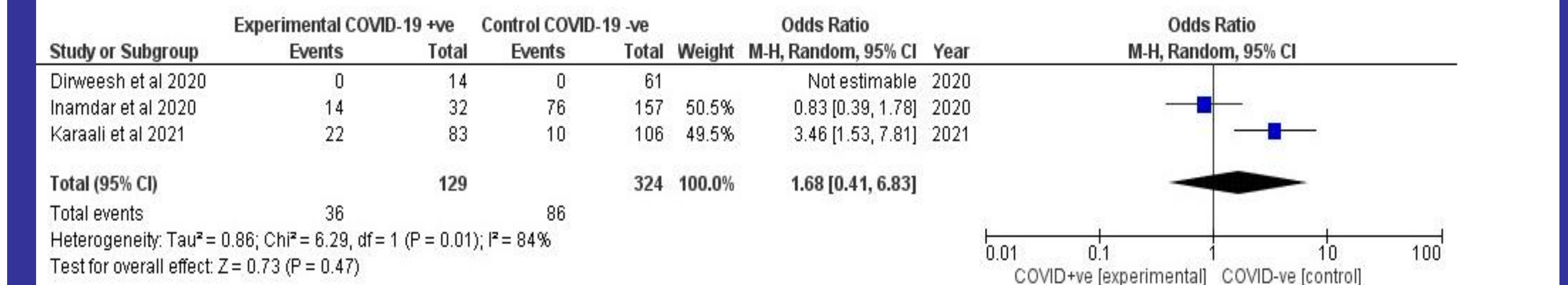


Forest Plot for Mortality in Acute Pancreatitis Patients with and without COVID-19 infection

We also found that there was **no statistically significant Standard Mean Difference (SMD)** (SMD 0.15, 95% CI -0.09 - 0.38) in the **age of occurrence** of AP and no statistically significant difference in the **CCI** in the two population groups (OR 1.68, 95% CI 0.41 - 6.83).



Forest Plot for SMD in age in acute pancreatitis in patients with and without COVID-19 infection



Forest Plot for CCI score in Acute Pancreatitis patients with and without COVID-19 infection

Discussion and Clinical Significance

Our study shows that AP in patients with COVID-19 infection is more severe with increased morbidity and mortality than in patients without COVID-19 infection.

Hence, regardless of age or associated comorbidities when AP and COVID-19 infection are present together in a patient; prompt and aggressive measures should be taken to treat both AP and COVID-19 infection to reduce the severity of a AP, prevent pancreatic necrosis and mortality.

We found the rate of idiopathic etiology of AP was higher in patients with COVID-19 infection. Some viruses such as cytomegalovirus, Epstein-Barr virus and herpes simplex virus have been associated to cause AP and SARS-Cov-2 might be one of them however, further large scale clinical trials with more population size are needed to confirm or refute this hypothesis.