

Search strategies

PubMed search strategy

#1: Cardiac Surgical Procedures [mh]

#2: Cardiac Surgical Procedures or Procedure, Cardiac Surgical or Procedures, Cardiac Surgical or Surgical Procedure, Cardiac or Surgical Procedures, Cardiac or Surgical Procedures, Heart or Cardiac Surgical Procedure or Heart Surgical Procedures or Procedure, Heart Surgical or Procedures, Heart Surgical or Surgical Procedure, Heart or Heart Surgical Procedure or cardiopulmonary bypass or extracorporeal circulation

#3: #1 or #2

#4: Hyperbilirubinemia [mh]

#5: Hyperbilirubinemia or Hyperbilirubinemias or Bilirubinemia or Bilirubinemias

#6: #4 or #5

#7: #3 and #6

1,217 Search results.

Results obtained May 29, 2020.

Cochrance search strategy

#1: Cardiac Surgical Procedures or Procedure, Cardiac Surgical or Procedures, Cardiac Surgical or Surgical Procedure, Cardiac or Surgical Procedures, Cardiac or Surgical Procedures, Heart or Cardiac Surgical Procedure or Heart Surgical Procedures or Procedure, Heart Surgical or Procedures, Heart Surgical or Surgical Procedure, Heart or Heart Surgical Procedure or cardiopulmonary bypass or extracorporeal circulation

#2: Hyperbilirubinemias or Bilirubinemia or Bilirubinemias

#3: #1 and #2

4 Search results.

Results obtained May 29, 2020.

Embase search strategy

#1: "heart surgery"/exp

#2: "heart surgery" or "cardiac surgery" or "cardiac surgical procedures" or "cardiosurgery" or "heart operation" or "myocardial resection" or "surgery, heart" or "extracorporeal circulation" or "cardiopulmonary bypass"

#3: #1 or #2

#4: "hyperbilirubinemia"/exp

#5: "bilirubinaemia" or "bilirubinemia" or "hyperbilirubinaemia" or "hyperbilirubinaemia" or "hereditary" or "hyperbilirubinemia, hereditary"

#6: #4 or #5

#7: #3 and #6

357 Search results.

Results obtained May 29, 2020.

Table S1 NOS of included studies

Author	Selection				Comparability	Outcomes			Total score
	Exposed cohort	Nonexposed cohort	Ascertainment of exposure	Outcome of interest		Assessment of outcome	Length of follow-up	Adequacy of follow-up	
Collins <i>et al.</i>	*	*	*	*	*	*	6
Chu <i>et al.</i>	*	*	*	*	**	6
Wang <i>et al.</i>	*	*	*	*	*	*	6
Michalopoulos <i>et al.</i>	*	*	*	*	**	*	7
Chandra <i>et al.</i>	*	*	*	*	*	*	6
An <i>et al.</i>	*	*	*	*	*	*	6
Hsu <i>et al.</i>	*	*	*	*	*	*	*	*	8
Kraev <i>et al.</i>	*	*	*	*	*	*	*	*	8
Nishi <i>et al.</i>	*	*	*	*	*	*	6
Sharma <i>et al.</i>	*	*	*	*	*	*	6

*, XXXXXXXXXXXX;, XXXXXXXXXXXX. NOS, Newcastle-Ottawa quality assessment scale.

Table S2 Sensitivity analyses of pooled incidence of hyperbilirubinemia

Excluding studies	No. of studies	Incidence rate (95% CI)	Heterogeneity (I ²)
<100 participants	9	0.22 (0.12–0.32)	98.90%
Including off-pump surgery	9	0.22 (0.12–0.32)	98.90%
Isolated heart valve surgery	8	0.23 (0.13–0.33)	99.00%
Isolated heart transplantation	8	0.19 (0.09–0.28)	98.60%

CI, confidence interval.

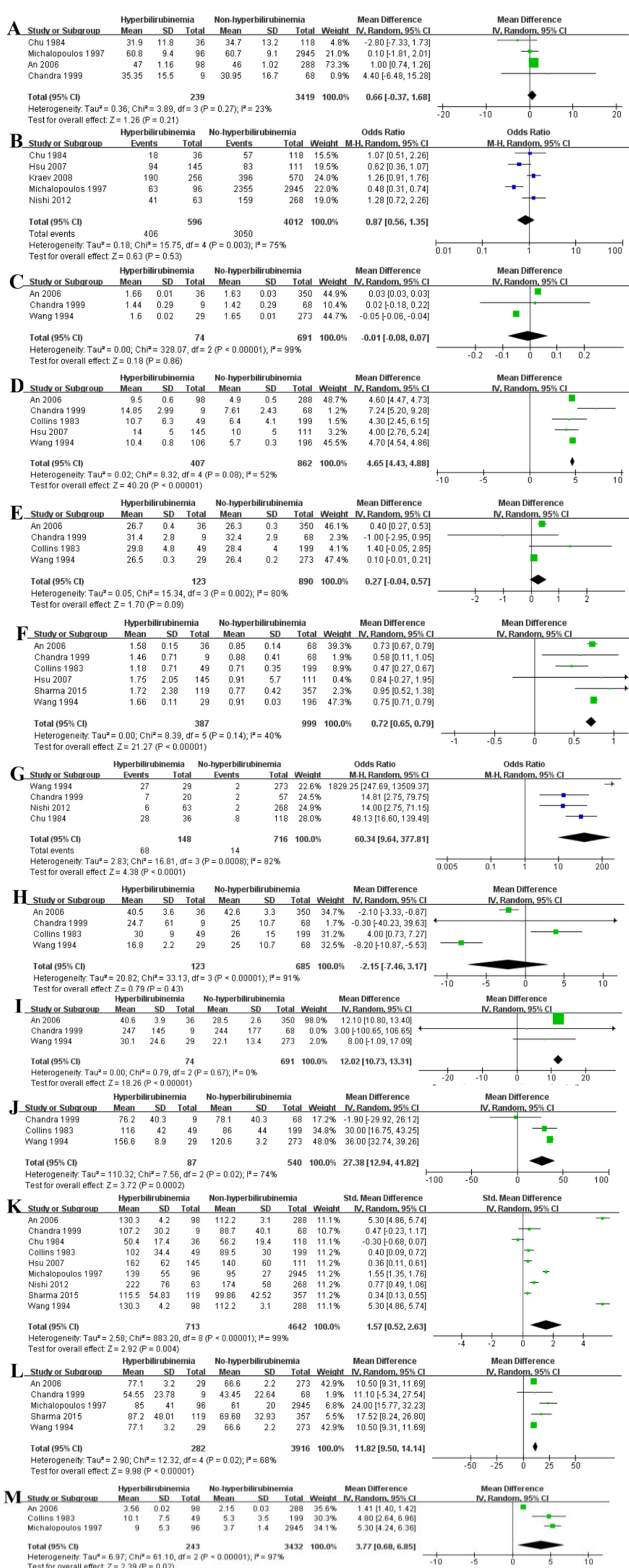


Figure S1 Forest plots of preoperative and intraoperative risk factors for postoperative hyperbilirubinemia after cardiac surgery. The included risk factors were (A) age, (B) sex, (C) body surface area, (D) right atrial pressure, (E) minimum esophageal temperature, (F) preoperative bilirubin concentration, (G) preoperative elevated bilirubin concentration, (H) aspartate amino transferase, (I) alanine aminotransferase, (J) alkaline phosphatase, (K) CPB time, (L) ACC time, and (M) the amount of blood transfused. CPB, cardiopulmonary bypass; ACC, aortic cross-clamp; CI, confidence interval.

Table S3 Sensitivity analyses of pooled mortality associated with hyperbilirubinemia

Excluding studies	No. of studies	Incidence rate (95% CI)	Heterogeneity (I ²)
<100 participants	8	10.99 (5.62–21.49)	66%
Non-emergency surgery	8	12.30 (6.61–21.87)	46%
<100 participants and non-emergency surgery	7	13.05 (7.52–22.66)	34%
Isolated heart valve surgery	8	9.01 (4.35–18.68)	67%
Isolated heart transplantation	8	11.02 (5.00–24.28)	69%

CI, confidence interval.

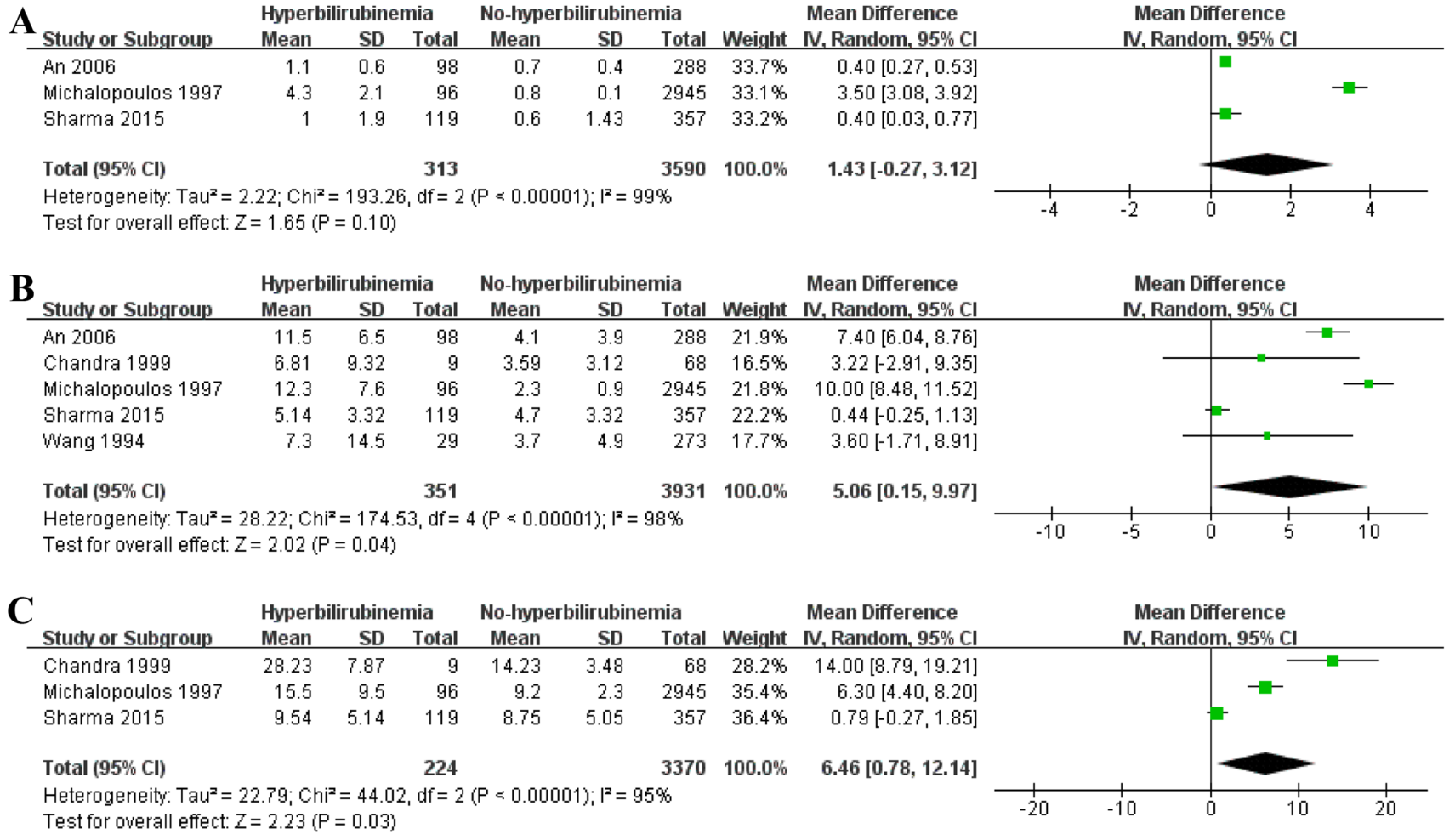


Figure S2 Forest plots of the associations of duration of mechanical ventilation (A), ICU stay (B), and hospital stay (C) with postoperative hyperbilirubinemia. CI, confidence interval.

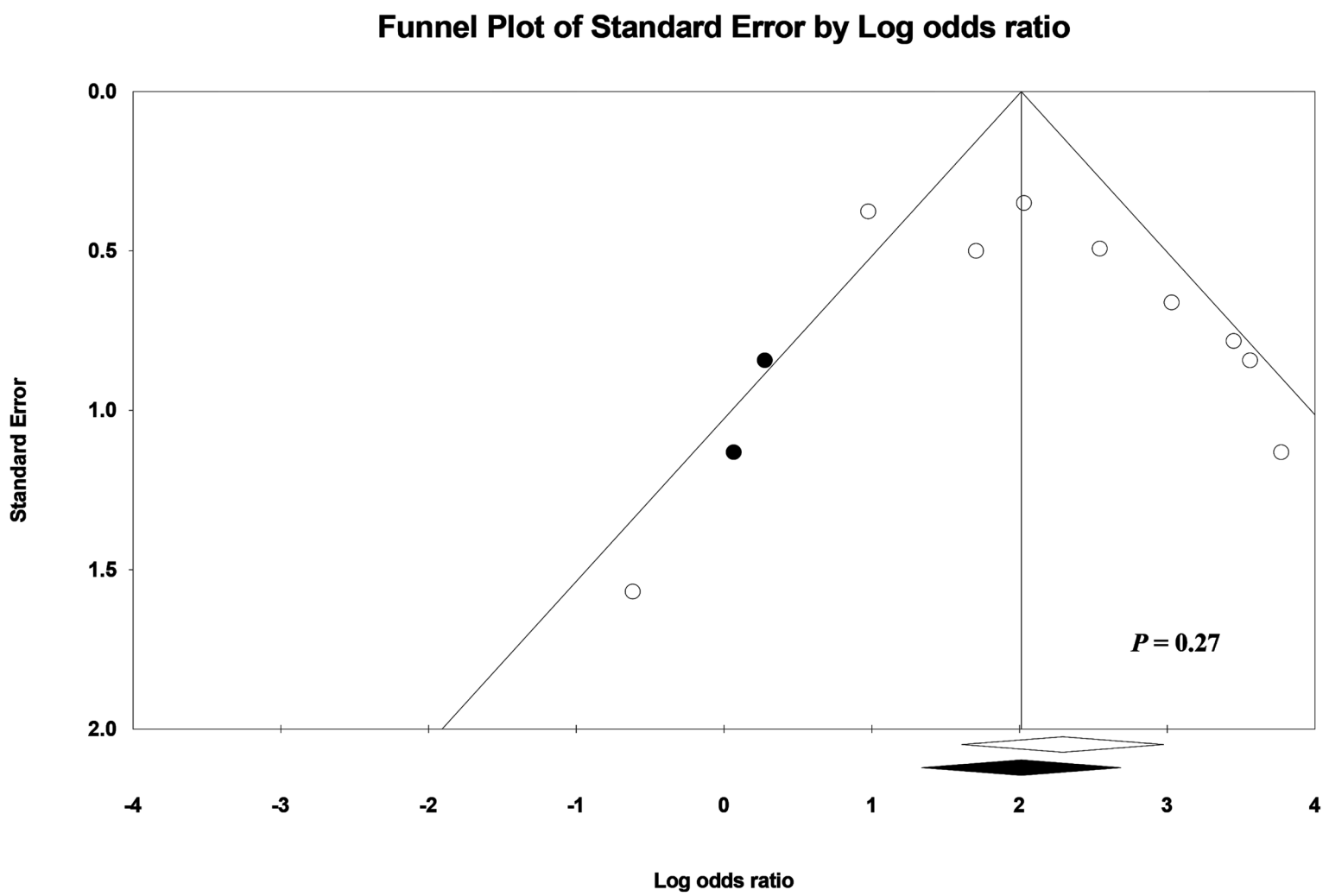


Figure S3 Funnel plots of studies to evaluate publication bias in in-hospital mortality risks.