THE PROGNOSTIC VALUE OF NEUTROPHIL TO LYMPHOCYTE RATIO IN ACUTE PANCREATITIS

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COI Disclosure

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The authors have no conflicts of interest to disclose.

BACKGROUND

- Acute pancreatitis (AP) is characterized by local and systemic inflammation, which is observed clinically from no systemic signs through the systemic inflammatory response syndrome (SIRS), organ failure (OF), persistent organ failure (POF), and death[1].
- Neutrophil to lymphocyte ratio (NLR), a simple, easily calculated systemic inflammation-based score, has been generally investigated in a variety of disease states, including inflammatory[2], cardiovascular[3], and neoplastic conditions[4].
- However, no meta-analysis has investigated the possible relationship between NLR and AP.

[1]Banks PA, Bollen TL, et, al. Gut 2013;62:102–11.
[2]de Jager CP, et al. Crit Care 2010;14:R192
[3]Park JJ, et al. Am J Cardiol 2013;111:636–42.
[4]Picher M, et al. Br J Cancer2013;108:901–7.

OBJECTIVE

We aimed to investigate the prognostic value of NLR in predicting mortality and severity among acute pancreatitis patients.

METHOD

A comprehensive search was conducted to identify all eligible studies → assessed the association of NLR and in acute pancreatitis published until January 2020

Databases :
- **Pubmed**
- **Google Scholar**
- **Proquest**
- **Science Direct**
- **Clinical Key**
- **Cochrane**

→ Revman 5.3, Random Effect or Fix Effect based on heterogeneity test for relative risk (RR) with Confidence Intervals (95% CI)

METHOD

1043 studies identified by primary search in the databases

722 studies excluded after title and abstract screening with initial "keywords"

321 studies assessed for eligibility

301 studies excluded did not meet the inclusion criteria and duplicate articles

6,078 patients

20 studies included in analysis

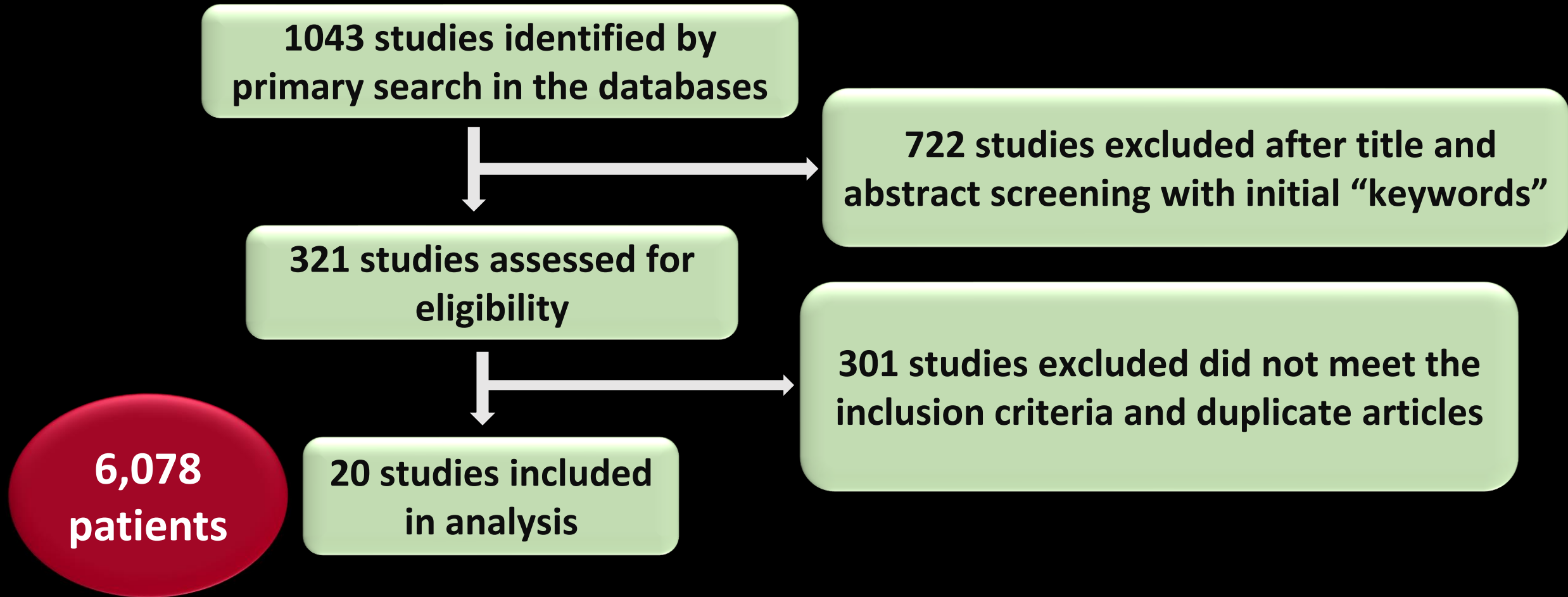**Figure 1. Flow diagram of studies selection**
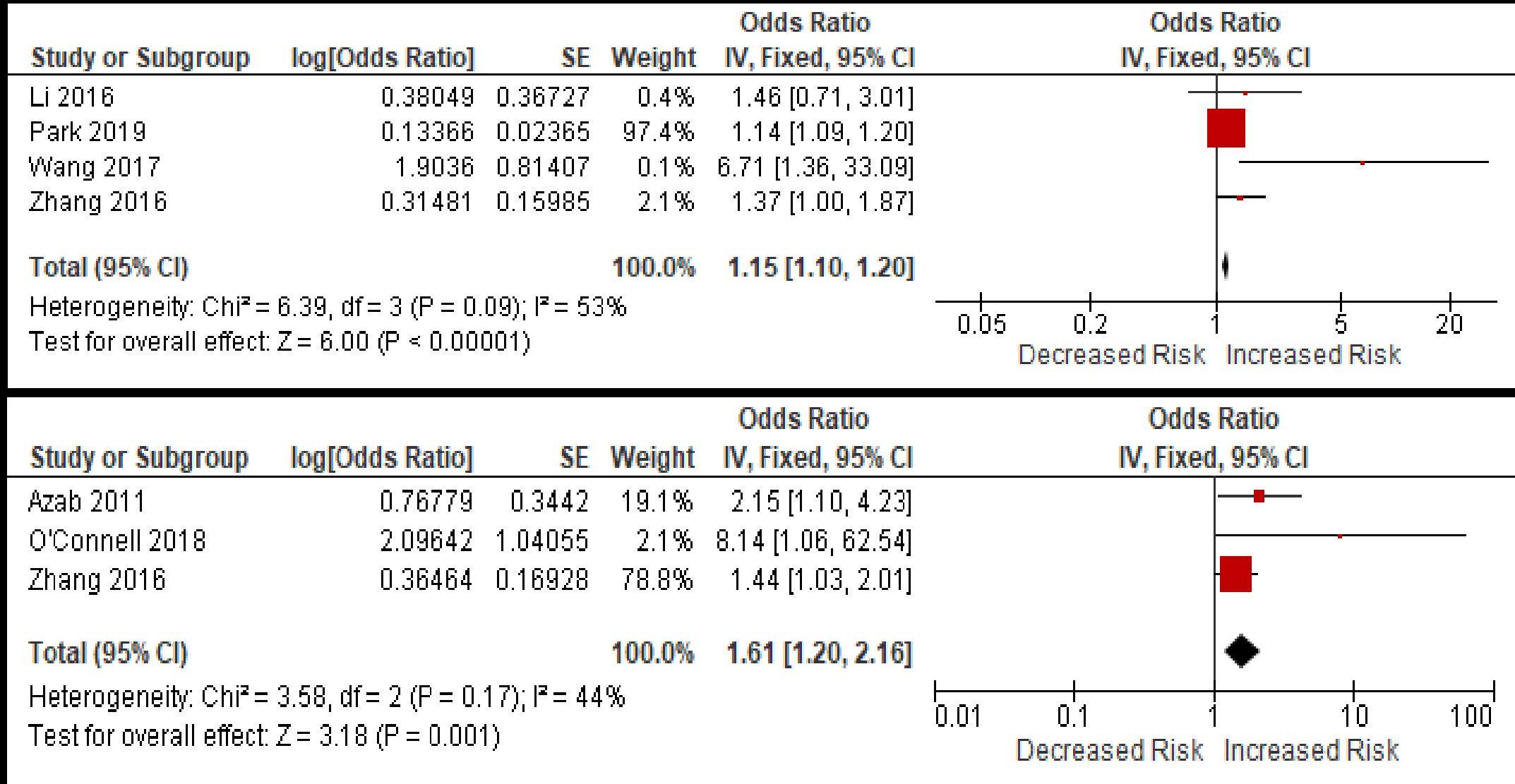
Figure 2. Pooled estimation of NLR in prediction of severe AP (above) and ICU admission (below) among AP patients

RESULT

				Odds Ratio	Odds Ratio
Study or Subgroup	log[Odds Ratio]	SE	Weight	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Li 2016	1.5531	0.544	41.5%	4.73 [1.63, 13.73]	
Zhang 2016	1.0116	0.4586	58.5%	2.75 [1.12, 6.76]	
Total (95% CI)			100.0%	3.44 [1.73, 6.85]	

Heterogeneity: Chi² = 0.58, df = 1 (P = 0.45); I² = 0%
Test for overall effect: Z = 3.53 (P = 0.0004)
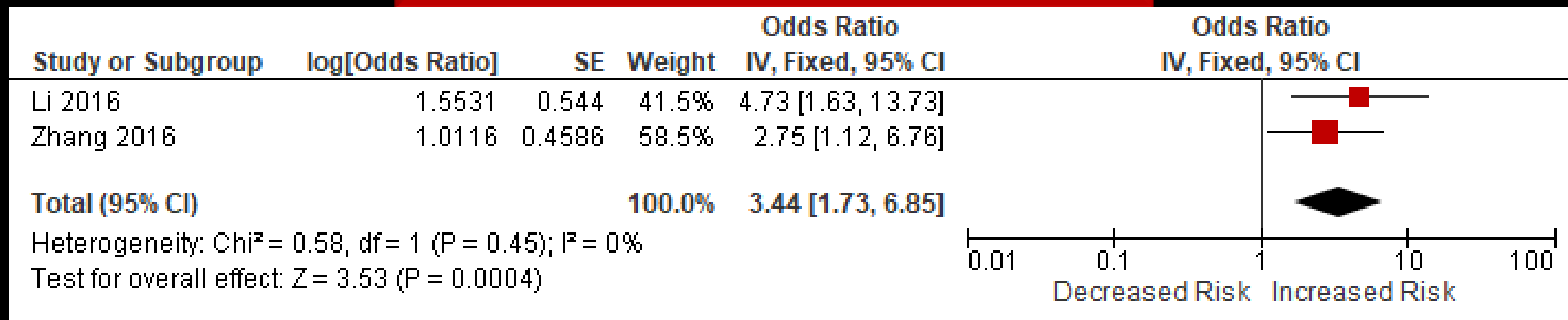
Figure 3. Pooled estimation of NLR in prediction of mortality among AP patients

	Severe			Mild				Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Gulen 2015	9.99	6.6963	14	5.77	3.77037	308	22.3%	4.22 [0.69, 7.75]	
Li 2016	25	13	31	10.47	16.9	328	18.4%	14.53 [9.60, 19.46]	
Orak 2016	24.58	16.92	16	11.45	11.38	478	10.9%	13.13 [4.78, 21.48]	
Zhang 2016	23.81	15.09	58	12.19	10.59	918	21.1%	11.62 [7.68, 15.56]	
Zhou 2019	13.64	2.9	14	6.65	4.93077	392	27.2%	6.99 [5.39, 8.59]	
Total (95% CI)			133			2424	100.0%	9.41 [5.90, 12.91]	

Heterogeneity: Tau² = 11.09; Chi² = 17.27, df = 4 (P = 0.002); I² = 77%
Test for overall effect: Z = 5.26 (P < 0.00001)

Figure 4. Pooled estimation of weighted mean difference of NLR between mortality and survived patients with acute pancreatitis.

RESULT

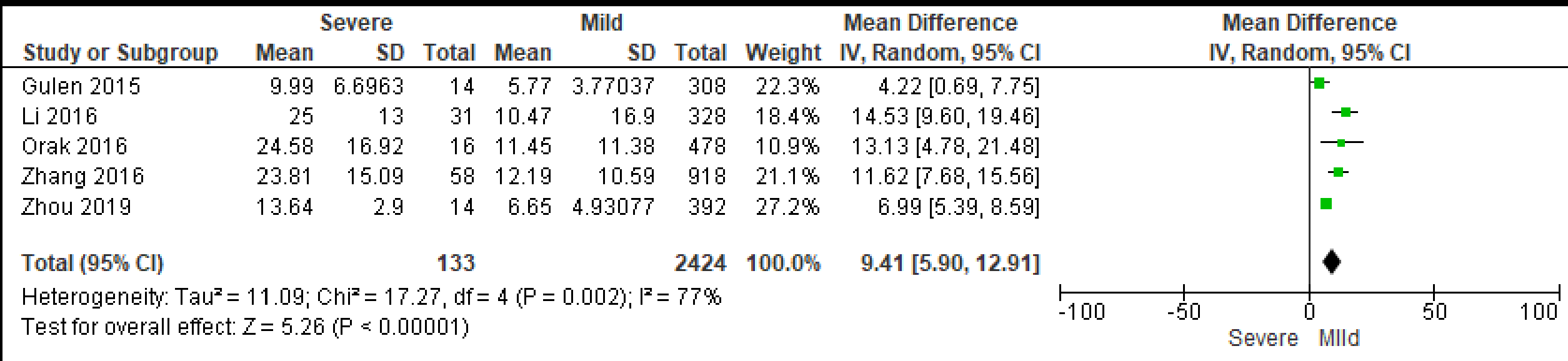| Study or Subgroup	Severe Mean	Severe SD	Severe Total	Mild Mean	Mild SD	Mild Total	Weight	Mean Difference IV, Random, 95% CI
Abayli 2018	16.36	11.96	53	8.56	9.68	382	5.2%	7.80 [4.44, 11.16]
Alimujiang 2015	14.64	4.65	44	7.12	2.75	62	7.2%	7.52 [5.98, 9.06]
Azab 2011	11.4	7.11	22	7.3	7.34	261	5.5%	4.10 [1.00, 7.20]
Cho 2018	9.8	8.8	19	8.7	8.3	90	4.3%	1.10 [-3.21, 5.41]
Cho-2 2018	32.4	30.9	6	17.1	17.4	128	0.3%	15.30 [-9.61, 40.21]
Huang 2019	12.24	8.37	45	8.32	7.24	223	6.0%	3.92 [1.30, 6.54]
Jeon 2017	6.71	5.71111	70	4.47	4.31111	420	7.3%	2.24 [0.84, 3.64]
Kokulu 2018	16	13.81	19	5.01	5.1	81	2.8%	10.99 [4.68, 17.30]
Li 2016	19.65	8.35	86	8.46	8.945	197	6.5%	11.19 [9.03, 13.35]
Orak 2016	13.85	13.17	194	10.6	10.66	300	6.5%	3.25 [1.04, 5.46]
Park 2019	14.85	10.9852	52	5.7	5.12593	620	5.6%	9.15 [6.14, 12.16]
Qi 2017	12.43	7.92	92	7.63	4.4	104	6.9%	4.80 [2.97, 6.63]
Raghavan 2019	9.1	0.88889	8	5.4	0.37037	22	7.8%	3.70 [3.06, 4.34]
Shen 2015	15.5	8.74074	30	10.9	7.77778	123	5.2%	4.60 [1.18, 8.02]
Suppiah 2013	18.15	9.03704	22	13.22	10.963	124	4.3%	4.93 [0.69, 9.17]
Wang 2017	14.6	5.9	10	6.9	3.9	100	4.8%	7.70 [3.96, 11.44]
Zhang 2016	19.89	14.26	223	10.8	9.22	551	6.7%	9.09 [7.07, 11.11]
Zhou 2019	10.7	5.0889	56	5.54	4.32593	237	7.2%	5.16 [3.72, 6.60]
Total (95% CI)			**1051**			**4025**	**100.0%**	**5.84 [4.53, 7.15]**

Heterogeneity: Tau² = 5.63; Chi² = 110.60, df = 17 (P < 0.00001); I² = 85%
Test for overall effect: Z = 8.73 (P < 0.00001)
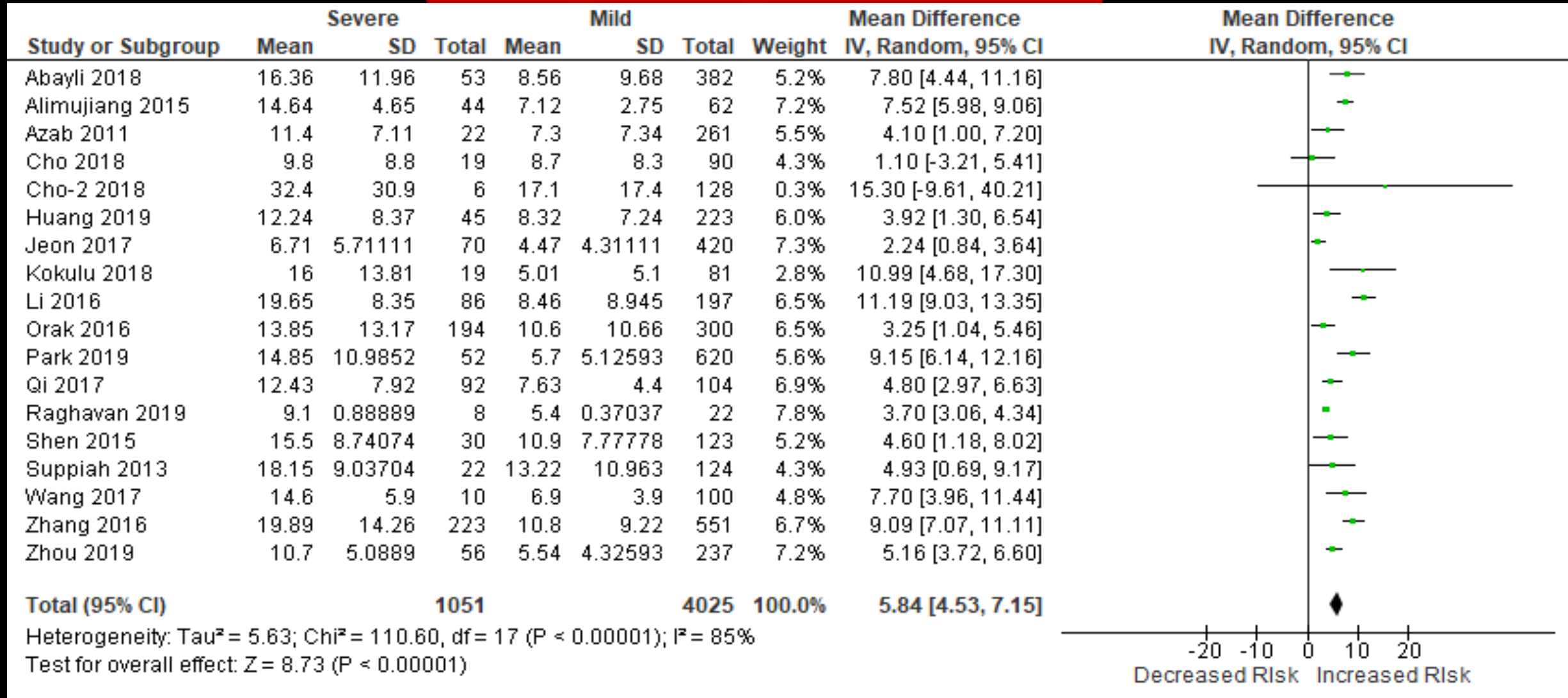
Decreased Risk   Increased Risk

Figure 5. Pooled estimation of weighted mean difference of NLR between Severe Acute Pancretitis and Mild Acute Pancretitis .

CONCLUSION

Higher NLR was an independent predictor of SAP, ICU admission, and mortality. Therefore, the use of the potential role of NLR should be emphasized due to its affordability and accessibility in the low-resource setting.