



Keyword: pregnancy outcome, ARDS, COVID-19

Introduction

This study aims to identify clinical characteristics and outcomes of pregnant women with COVID-19 ARDS in Indonesia since we found a lack of research reports on the issue, especially during the second wave where it reached the highest peak in number of deaths due to COVID-19 infection in that country.

Materials

Results and Discussion

mortality rate in this study might be caused by several factors. First, the population of patients admitted were already in severe condition with high risk of morbidity and mortality who required intensive care, as Fatmawati Hospital as a tertiary hospital was appointed to be one of the referral center for severe and critical COVID-19 cases. Second, the high spike of cases in the second wave led to a shortage of intensive isolation care units so that many patients were late to treat or did not receive a proper care. Third, the emergence of the B.1.617.2 Delta variant of SARS-Cov-2 virus in the second wave which has higher transmission power, virulence, and severity (9), contributed to the high mortality rate.

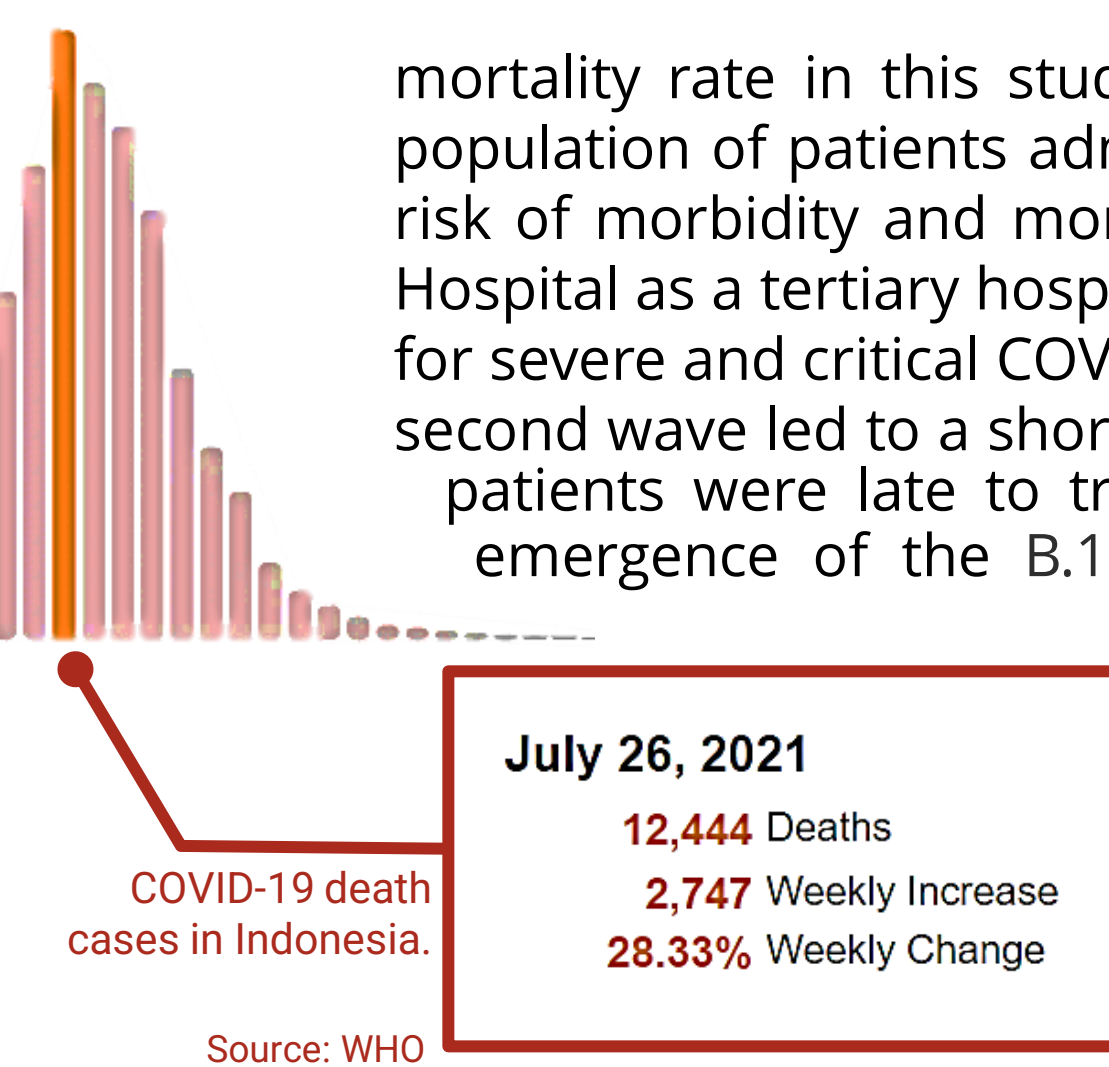
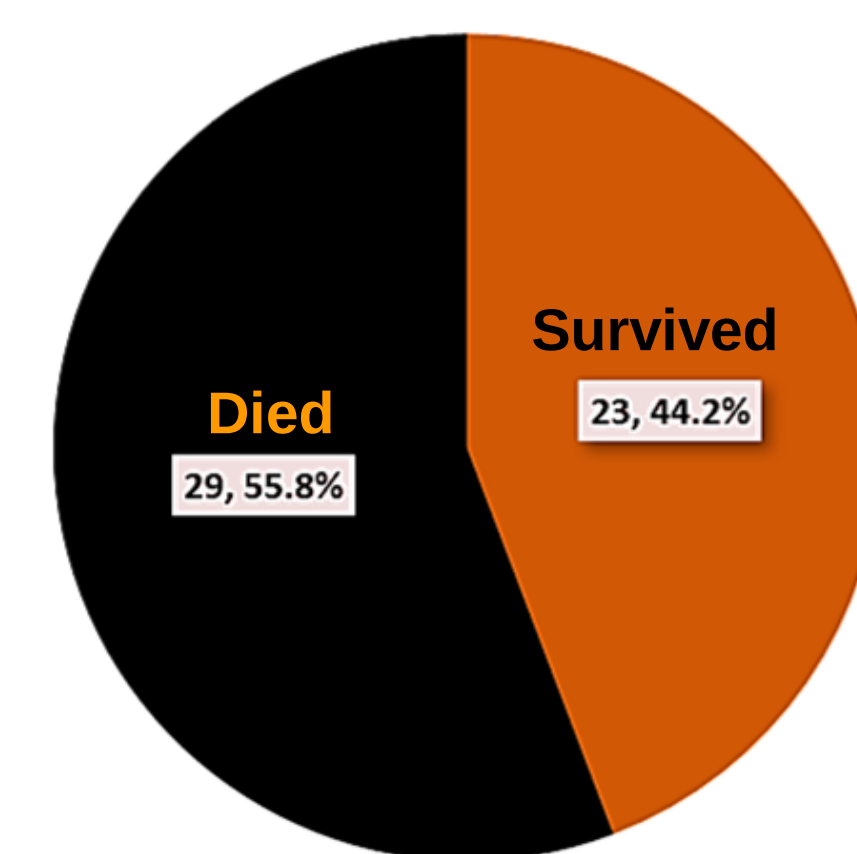


Table 1. Baseline clinical characteristics at presentation

Characteristics	Mean ± SD			Min-Max	P value (95% CI)
	Survived (n=23)	Died (n=29)	Cumulative		
Age (years)	30.52 ± 4.491	31.59 ± 5.6	31.12 ± 5.12	17-41	>0.05
Gestation	2.39 ± 1.27	2.24 ± 1.02	2.31 ± 1.13	1-6	
Gestational age (weeks)	33.09 ± 5.83	31.41 ± 3.42	32.15 ± 4.67	17-40	

SD: Standard Deviation, CI: Confidence Interval

Table 2. Vital signs at presentation

Vital signs	Mean ± SD			P value (95% CI)
	Survived (n=23)	Died (n=29)	Cumulative	
HR (beats/minute)	113.9 ± 15.45	119.07 ± 16.72	116.79 ± 16.22	>0.05
RR (times/minute)	26.65 ± 9.7	34.31 ± 10.45	30.92 ± 10.74	0.001
O ² saturation (%)	94.95 ± 4.34	78 ± 16.68	85.31 ± 15.35	<0.001
Temperature (°C)	36.72 ± 0.77	36.76 ± 0.8	36.74 ± 0.78	
SBP (mmHg)	126.26 ± 24.08	119.28 ± 28.97	122.37 ± 26.89	>0.05
DBP (mmHg)	79.74 ± 16.7	72.59 ± 19.9	75.75 ± 18.73	

SD= Standard Deviation, CI= Confidence Interval; HR= heart rate; RR= respiratory rate; O²= Oxygen; SBP= systolic blood pressure; DBP= diastolic blood pressure

Table 3. COVID-related symptoms at presentation

Symptoms	Survived (n,%)	Died (n,%)	P value (95% CI)
Fever	15 (28.8)	24 (46.2)	0.147
Cough	22 (42.3)	24 (46.2)	0.21
Dyspnea	12 (23.1)	27 (51.9)	0.001
Runny nose	9 (17.3)	7 (13.5)	0.245
Diarrhea	-	2 (3.8)	0.497
Headache	4 (7.7)	3 (5.8)	0.686
Nausea/vomiting/anorexia	5 (9.6)	6 (11.5)	1.00
Muscle aches	3 (5.8)	1 (1.9)	0.31
Fatigue	4 ((7.7)	-	0.03
Anosmia	1 (1.9)	3 (5.8)	0.621
Ageusia	-	1 (1.9)	1.00
Sore throat	4 (7.7)	1 (1.9)	0.157
Abdominal pain	2 (3.8)	-	0.191
Altered consciousness	-	3 (5.8)	0.245

Table 4. Maternal blood examination result at presentation

Laboratory parameters	Mean $\pm$ SD		P value (95% CI)
	Survived	Died	
Leukocyte ($\times 10^3/\mu\text{L}$)	8.52 $\pm$ 2.97	12.92 $\pm$ 6.01	0.002
NLR (μL)	7.03 $\pm$ 3.04	9.69 $\pm$ 4.33	0.031
LDH (U/L)	312 $\pm$ 137.24	540.58 $\pm$ 206.03	0.001
PCT	2.18 $\pm$ 6.28	1.37 $\pm$ 2.33	0.037
CRP (mg/dL)	4.94 $\pm$ 3.44	11.93 $\pm$ 11.89	0.001
Ferritin (ng/dL)	194.5 $\pm$ 133.97	743.18 $\pm$ 628.05	0.001
Fibrinogen (mg/dL)	525.37 $\pm$ 103.58	595.95 $\pm$ 128.36	0.07
D-Dimer (ng/mL)	2652.24 $\pm$ 4455.24	2479.11 $\pm$ 2128.54	>0.05

SD: Standard Deviation; CI: Confidence Interval; Hb: haemoglobin; NLR: neutrophil-to-lymphocyte ratio; AST: aspartate aminotransferase; ALT: alanine aminotransferase; LDH: lactate dehydrogenase; PCT: procalcitonin; CRP: C-reactive protein

Table 5. Maternal outcomes during hospitalization

Outcomes	Survived		Died		Cumulative	P value (95% CI)
	N (%)	Mean ± SD	N (%)	Mean ± SD		
Delivered						
Spontaneous	1 (1.9)		-		1 (1.9)	
CS	15 (28.8)		18 (34.6)		33 (63.4)	
Spontaneous Abortion	-		1 (1.9)		1 (1.9)	
No pregnancy termination	7 (13.5)		10 (19.2)		17 (32.7)	
Average LOS (days)		13.61 ± 3.97		7.07 ± 5.27	9.96 ± 5.73	<0.001
On Mechanical Ventilation	7 (10.4)		25 (37.3)		32 (47.8)	<0.001

SD: Standard Deviation; CI: Confidence Interval; CS: caesarean section; LOS: length of hospitalization

Table 6. Fetal outcomes of ARDS pregnant women

Outcomes	Survived		Died		Cumulative	P value (95% CI)
	N (%)	Mean ± SD	N (%)	Mean ± SD		
After delivery						
Died	-		1 (1.9)			
Survived	16 (30.8)		17 (32.7)			
Not yet delivered						
Died intrauterine	-		11 (21.1)			
Alive intrauterine	7 (13.5)		-			
Mean Birthweight (grams)		2858 ± 639		2641.33 ± 542.66	2725.48 ± 598.2	>0.05

Conclusion

The mortality rate for pregnant women due to COVID-19 ARDS in this study was high, reaching 55.8%. There were significant differences in respiratory rate, oxygen saturation, shortness of breath and fatigue symptoms at presentation between pregnant women who died and survived. Maternal blood tests were significantly different between the groups in leukocyte count, NLR, LDH, PCT, CRP, and ferritin. Mechanical ventilation therapy and length of hospitalization between pregnant women who died and survived differed significantly as well.

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