2017

Use of steroids for early stage ARDS in ICU patients

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OBJECTIVE

- Compare outcomes in patients treated with high-dose and low-dose corticosteroids in the early stage of Acute Respiratory Distress Syndrome (ARDS).

BACKGROUND

- ARDS is characterized by excessive inflammation and is associated with a substantial risk of death. Treatment is focused on supportive care, including ventilator support, fluid restriction, and prone positioning.[6]
- Despite the inflammatory component of the disease, the use of steroids in this setting is controversial.
- Historically, studies that have focused on high-dose, short-term corticosteroids failed to show improvements in mortality.[2,3]
- Later studies looking at low-dose corticosteroids found a reduced mortality risk and improvement in morbidity.[5,8]
- Most recently, a study showed high-dose steroids followed by a taper resulted in increased 60-day mortality and fewer ventilator-free days.[7]

METHODS

- Retrospective chart review of subjects diagnosed with ARDS that received steroids
- Data was collected on subjects admitted June 2013 - June 2017
- Groups were analyzed based on average dose of methylprednisolone received within first 72 hours following diagnosis:
  - Low-dose: ≤ 2.5mg/kg/day
  - High-dose: > 2.5mg/kg/day
- **Inclusion Criteria:**
  - Age ≥ 18 years
  - Diagnosis of ARDS
  - Receiving steroids for at least 72 hours following diagnosis
  - Admitted to the ICU
  - Order for steroids
- **Outcomes:**
  - 60-day mortality
  - Average ICU length of stay (LOS)
  - Average ventilator days

83 patients diagnosed with ARDS in ICU with order for steroids

45 excluded
- 8 received steroids for < 72h
- 1 received no steroids following diagnosis
- 36 received stress-dose steroids for septic shock

38 patients met inclusion criteria

RESULTS

Table 1: Baseline Characteristics

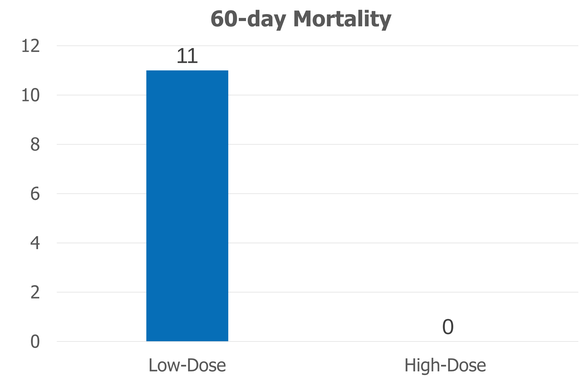
	Low-Dose (n = 29)	High-Dose (n = 9)
Mean Age (years ± SD)	57.1 ± 10.6	47.9 ± 13.2
Male (%)	65.5	55.5

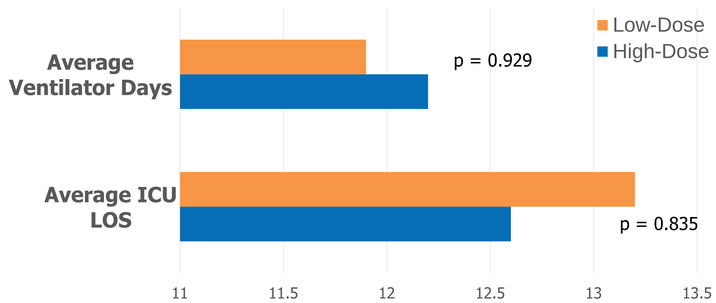
Table 2: Baseline Characteristics

	Low-Dose (n = 9)	High-Dose (n = 5)	p-value (95% CI)
Mean SOFA score at time of ICU entry	7.8	8.2	0.754 (-4.16, 3.09)

Table 3: Baseline Characteristics

	Low-Dose (n = 19)	High-Dose (n = 4)	p-value (95% CI)
Mean PaO2/FiO2 at time of diagnosis	122.3	84.7	0.403 (-54, 129.2)





RESULTS

Table 4: Adverse Effects

	White Blood Cells (cells x 10^3/mcL)		Hemoglobin (g/dL)		Blood Glucose (mg/dL)	
	Baseline	7 days	Baseline	7 days	Baseline	7 days
Low-Dose	11.1	13.7	11.5	10.8	147.6	137.9
High-Dose	11.9	11.9	9.6	9.4	145.7	125.8

All data is reported as mean

DISCUSSION & CONCLUSIONS

- Diagnosis of ARDS and treatment with steroids is not a consistent practice among physicians.
- Three subjects were lost to follow up in regards to 60-day mortality.
- Patients in the high-dose group experienced less mortality and ICU length of stay despite being classified as more severe at diagnosis. This is contradictory to what most recent studies have shown.[7]
- The unexpected improvement in blood glucose from baseline to 7 days is most likely the result of insulin administered during the hospital stay.
- Limitations
  - Retrospective chart review with inadequate documentation
  - Significant exclusion rate resulted in small patient population
  - Single study site may limit generalizability
- Future Research & Impact on Practice
  - This study did not have a large enough sample size to detect a significant difference in the outcomes.
  - Further prospective, randomized controlled studies are needed to assess the optimal dose of steroids to be used during the early stage of ARDS.
  - Overall, the goal would be to develop a standardized practice regarding the treatment of early ARDS.

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Special thanks to Sarah Shields, PharmD for her contributions

Disclosure

The authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:
Jasmine Coatie: Nothing to disclose | Michael Todt: Nothing to disclose | Megan Straub: Nothing to disclose