RSI STUDY SUMMARY

RSI
Randomized trial of Sedative choice for Intubation

Why was this study done?

Each year millions of seriously ill adults need life-saving treatment with a breathing machine. To safely place someone on a breathing machine (a procedure known as "intubation"), doctors give a drug to make the patient sleepy (known as a "sedative").

The two "sedative" drugs given most often to seriously ill patients receiving a breathing tube in the United States are ketamine and etomidate. Both drugs are approved by the United States Food and Drug Administration (FDA).

Both are considered safe and effective. Both are given by doctors all the time. But it is not known which drug is best.

What is intubation and why do some patients need it?

Intubation means inserting a tube into a person's windpipe so they can breathe with the help of a machine called a ventilator. It's done when patients are too sick to breathe well on their own — for example, during sepsis, pneumonia, heart failure, or after cardiac arrest.

Because it's uncomfortable, patients are given a sedative to make them unconscious and prevent pain while the breathing tube is being placed.

What Drugs Were the Focus of the Study?

What Is Ketamine?

Ketamine is a drug that causes a patient to feel very drowsy, blocking pain and making patients unaware of what's happening. It's sometimes used in emergency rooms because it can help keep blood pressure stable and doesn't affect hormone production.

What Is Etomidate?

Etomidate is a drug used to make people unconscious before procedures like intubation. It usually doesn't lower blood pressure much, which is good for sick patients. However, it can temporarily reduce the body's ability to make cortisol, a hormone that helps the body handle stress — raising concerns it might increase the risk of death.

Researchers Wanted to Know:

Does using ketamine instead of etomidate for intubation in critically ill adults lower the chance of dying in the hospital?

What Happened During the Study?

Researchers compared the two drugs in more than 2,300 critically ill adults who needed emergency intubation in emergency departments (EDs) or intensive care units (ICUs).

Half of the patients received ketamine and half received etomidate. Researchers follow patients for 28 days to see who survived and who had complications.

How Was the Study Done?

This was a randomized clinical trial, meaning patients were randomly assigned to get one of the two drugs, ensuring fair comparison.

Doctors recorded patients' blood pressure, heart rhythm, and need for medicines to support blood pressure during and right after intubation.

Where Did the Study Take Place?

At 14 emergency departments and intensive care units in six major U.S. hospitals, including Denver Health, Hennepin Healthcare, University of Alabama at Birmingham, University of Colorado Hospital, Vanderbilt University Medical Center and Wake Forest Atrium Health.

Who Participated in the Study?

2,365 critically ill adults (average age 60)

- 47% had sepsis or septic shock
- 22% on medicines to increase blood pressure (vasopressors)
- About half were intubated in the ED and half in the ICU

How Long Did the Study Last?

Each patient was followed for 28 days after intubation, and the full study ran for about 3 years.

What Were the Results of the Study?

The study medicines did not affect whether patients survived or died from their critical illness. Ketamine caused patients to have lower blood pressuring during intubation.

Deaths by 28 days:

- Ketamine group: 28.1%
- Etomidate group: 29.1%

Heart and blood pressure problems during intubation:

- Ketamine group: 22.1%
- Etomidate group: 17.0%

➤ The sedative etomidate is safe to use and, compared with ketamine, significantly decreases the risk of dangerously low blood pressure for critically ill patients undergoing intubation.

➤ **No significant difference in survival.**

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What Were the Demographics of the Study Participants?

Baseline Characteristics of the Patients at the time of intubation		
Characteristic	Ketamine (N=1,176 Patients)	Etomidate (N=1,189 Patients)
Age, years – median	60	60
Percentage of patients in the study.		
Female sex – %	42.3%	41.4%
Race/ethnic group – %		
Non-Hispanic White	58.3%	59.4%
Non-Hispanic Black	25.5%	24.1%
Hispanic	11.1%	11.1%
Other	5.1%	5.4%

Participating Sites

Denver Health
Hennepin Healthcare
University of Alabama at Birmingham
University of Colorado Hospital
Vanderbilt University Medical Center
Wake Forest Atrium Health

The RSI Study is a Patient-Powered Study. Guidance from patients helped to improve the patient-centeredness of the study outcomes, accessibility of study documents and the dissemination of study findings to a wider audience.

Patient Partners with lived experience serve on the Study Steering Committee in a leadership capacity.

Want To Learn More About Critical Care Trials?

PCCRG is a network of doctors, nurses, respiratory therapists, researchers, and patient partners across the United States dedicated to improving outcomes for critically ill patients.

PCCRG performed randomized trials to compare treatments that patients are receiving in clinical care and understand which treatments produce the best patient outcomes.

https://www.pragmaticcriticalcare.org/

Where Can I Learn More About This Study?

ClinicalTrials.gov Identifier: NCT05277896

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Learn more about RSI

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