

Post-ICU Syndrome

Robin Saiki DNP, ACNP-BC
 Kasey Bowden MSN, FNP, AGACNP

Disclosures

Robin Saiki DNP, ACNP-BC
 Kasey Bowden MSN, FNP, AGACNP

have no financial relationships with commercial interests to disclose

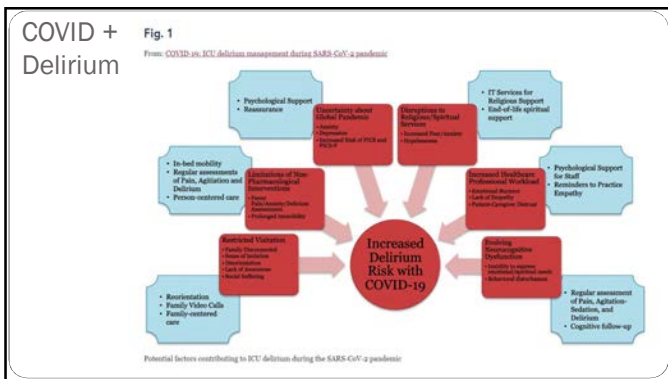
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Objectives

- Provide brief overview of ICU Delirium including signs/symptoms, evaluation and management
- Define and describe signs/symptoms of Post-ICU syndrome (PICS), and discuss impact of COVID on PICS
- Discuss long-term complications for both patients and caregivers related to PICS

ICU Delirium

| Signs and Symptoms | Risk Factors |
|---|---|
| <ul style="list-style-type: none"> • Quick onset** • Wax and wane** • Inattention** • Reduced awareness of environment • Disorganized thinking** • Altered level of consciousness** | <ul style="list-style-type: none"> • Older • Dementia/Pre-existing cognitive impairment • Cancer • AIDS • Surgery • Terminal illness • Vision/hearing impairments • Multiple psychoactive medications |



Delirium Cont

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Persistent Delirium Predicts Increased Mortality

Dan K. Kuty, MPH, MA, Edward R. Marcantonio, MD, SM, Sharon K. Inouye, MD, MPH, Michael L. Shaffer, PhD, Margaret A. Bergmann, MS, GNP, Frances M. Yang, PhD, Michael A. Feinglass, PhD, and Richard K. Jorjes, MD

Institute for Aging Research, Hebrew SeniorLife, Boston, Massachusetts (Drs. Inouye, Yang, Feinglass, Jones and Dr. Kuty); Division of General Medicine and Primary Care, Beth Israel Deaconess Medical Center, Boston, Massachusetts (Drs. Marcantonio, Ma, Bergmann); Harvard Medical School/Beth Israel Deaconess Medical Center Department of Medicine, Boston, Massachusetts (Drs. Inouye, Marcantonio); Harvard Medical School/Brighton and Women's Hospital, Department of Psychiatry, Boston, Massachusetts (Dr. Yang); Division of Geriatrics, Department of Public Health Sciences, Penn State College of Medicine, Hershey, PA (Dr. Shaffer).

Abstract

OBJECTIVES—To examine the association between persistent delirium and one-year mortality in newly admitted delirious post-acute care (PAC) facility patients, who were followed regardless of residence.

DESIGN—Observational cohort study.

SETTING—Eight geriatric inpatient delirium specialty facilities specializing in PAC.

PARTICIPANTS—Of one hundred and twelve PAC patients with delirium at the time of admission who are newly hospitalized.

MEASUREMENTS AND MAIN RESULTS—Assessments were done at baseline and four follow-up times: 2-week, 6-week, 12-week and 26-week. “Confusion Assessment Method” delirium was assessed, as were factors used to calculate an outcome including age, gender, comorbidity, functional status and dementia. The outcome was one-year mortality determined by the National Death Index and corroborated by medical record and proxy telephone interviews.

RESULTS—Nearly one third remained delirious at 6 months. The cumulative one-year mortality was 30%. Independent of age, gender, comorbidity, functional status and dementia, subjects with persistent delirium over 21 (95% confidence interval, 11, 4.4 times more likely to die during the one-year follow-up compared to subjects who resolved their delirium. This association remained robust and consistent in analyses with and without dementia. Additionally, when delirium resolved

Causes of delirium

- Medications
 - Anticholinergics
 - Antihistamines
 - Sedatives
 - Narcotics
 - Antidepressants
 - Lithium
 - Neuroleptics
 - Anesthesia
- Substances/Withdrawal
 - Ethanol
 - Benzos
 - Opiates
 - Illicit drugs
- Metabolic
 - Electrolyte abnormalities: (Na, Ca)
 - Hypo and hyperglycemia
 - Acid-base disturbance
 - Dehydration
 - Hypoxia
 - End organ damage
 - Vitamin deficiency
 - Fever or hypothermia

Causes of Delirium

- Infectious
 - UTI
 - Encephalitis or meningitis
 - Pneumonia
 - Sepsis
 - Influenza
- Neurologic
 - Brain tumor
 - Seizure
 - CVA
 - Subdural hematoma
- Endocrine
 - Hyperthyroidism
 - Hypothyroidism
 - Parathyroid
- Cardiovascular
 - HF
 - Arrhythmia
 - AMI

ICU Delirium Assessment

| Feature 1: Acute Onset or Fluctuating Course | Score | Check Item if Present |
|---|---------------------------------|---|
| Is the patient different than their baseline mental status? Has the patient had any fluctuation in mental status in the past 24 hours as evidenced by fluctuation on a sedation/level of consciousness scale (i.e., RASS/OASIS, GCS), or previous delirium assessment? | Either question 'Yes' → | <input type="checkbox"/> |
| Feature 2: Inattention Letter Attention Test (See training manual for alternate pictures) Directions: Say to the patient, "I am going to read you a series of 10 letters. Whenever you hear the letter 'A,' indicate by squeezing my hand." Read letters from the following letter set in a normal tone 3 seconds apart. SAVEAHAART or CASABLANCA or ABADBADAAY Errors are counted when patient fails to squeeze on the letter "A" and when the patient squeezes on any letter other than "A." | Number of Errors >2 → | <input type="checkbox"/> |
| Feature 3: Altered Level of Consciousness Present if the Actual RASS score is anything other than alert and calm (zero) | RASS anything other than zero → | <input type="checkbox"/> |
| Feature 4: Disorganized Thinking Yes/No Questions (See training manual for alternate set of questions) 1. Will a stone float on water? 2. Are there fish in the sea? 3. Does one pound weigh more than two pounds? 4. Can you use a hammer to pound a nail? Errors are counted when the patient incorrectly answers a question. Comments: Say to patient: "Hold up this many fingers" (hold 2 fingers in front of patient) "Now do the same thing with the other hand" (Do not repeat number of fingers). "If the patient is unable to move both arms, for 1st part of command ask patient to "Use one more finger". An error is counted if patient is unable to complete the entire command. | Combined number of errors >1 → | <input type="checkbox"/> |
| Overall CAM-ICU Feature 1 plus 2 and either 3 or 4 present = CAM-ICU positive | Criteria Met → | <input type="checkbox"/> CAM-ICU Positive (delirium present) <input type="checkbox"/> CAM-ICU Negative (no delirium) |

Evaluation/Workup

- **History!!!** Drugs, Substance Use, Underlying medical issues
- Assess symptoms i.e. uncontrolled pain, fever
- Assess for missing aides i.e. hearing aides, glasses, dentures, etc
- Vital Signs
- Urinalysis/Culture
- BMP, Blood glucose
- Drug levels
- Thyroid studies
- Urine drug screen
- Blood cultures
- CT brain
- LP
- Troponin
- ABG

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Treatment

- Reorientation
- Cognitive stimulation activities
- Exercise
- Feeding and fluid assistance
- Non-pharmacologic sleep aids
- Haloperidol Not FDA Approved
- Precedex infusions instead of benzo infusions in the ICU
- Quetiapine* Only in patients with Parkinson's with delirium

Delirium Take Home Points

- Assess risk of delirium for hospitalized patients
- Utilize screening tools for early identification of delirium
- Cornerstone of treatment is treating the underlying cause
- Once underlying cause addressed, mainstays of treatment are supportive in nature i.e. re-orientation, sleep/wake cycle, removal of central-acting meds and/or tethers, etc
- Medical treatment only warranted if your patient presents risk to themselves or others

Post-ICU Syndrome Definition (SCCM)

Collection of symptoms

Impairment in:

- Physical
- Cognitive
- Psychological status that occurs after critical illness that continues after discharge from the hospital/acute care setting.

Can be one realm or all three

Background

- Improved technology → increased survival after critical illness
- Majority of patients discharged from ICU
- Prolonged ICU stays associated with psychological distress r/t memories
- Increasing incidence of PICS

Scope of the Problem

- > 800,000 Americans admitted to ICUs per year
- Significant advances in technology over last 25 years
- Majority of patients survive critical illness
- Up to 40% of ICU survivors + family have some degree of PICS

Scope of the Problem

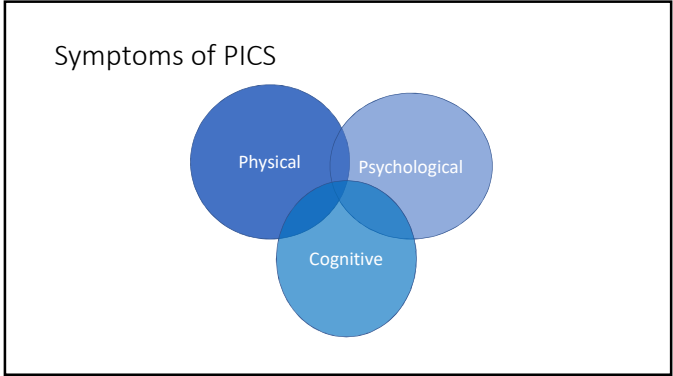
- Overwhelming majority (85-95%) of patients with ICU-acquired weakness (ICU-AW) have symptoms that last 2-5 years +
- Almost ¾ of patients with diagnosis of ARDS have cognitive deficits at discharge and ¼ still have at 6 years.
- Up to ½ of ICU survivors have psychological effects (anxiety, depression, PTSD, sleep disturbances) that may become chronic.
- 50% of ICU survivors require caregiver at one year.

COVID-19 & PICS

The image shows a screenshot of a medical commentary article. At the top, it says 'COVID-19 & PICS'. Below that, it identifies the article as a 'COMMENTARY' by 'Wesley J. Star, MD, PhD, Gerald Stucki, MD, PhD, and Jerome Bickenbach, LLB, PhD'. The article title is 'COVID-19 AND POST INTENSIVE CARE SYNDROME: A CALL FOR ACTION'. A key quote from the article is highlighted: 'Although we are currently overwhelmed by the astonishing speed of infection of the Covid-19 pandemic, and the daily onslaught of new, and ever-worsening predictions, it is vital that we begin to prepare for the aftershocks of the pandemic. Prominent among this will be the cohort of post-intensive care survivors who have been mechanically ventilated and will likely experience short- and medium-term consequences. The notion that patients surviving intensive care and mechanical ventilation for several weeks can be discharged home without further medical attention is a dangerous illusion. Post-Intensive Care Syndrome and other severe conditions will require not only adequate screening but early rehabilitation and other interventions. Action must be taken now to prepare for this inevitable aftershock to the healthcare system.'

Risk Factors

- Longer duration of delirium in ICU
- Acute brain dysfunction
- Hypoxia
- Hypotension
- Glucose abnormalities
- Prolonged ventilation
- Severe sepsis
- Need for RRT
- ARDS
- Cognitive issues at baseline
- Female gender
- Lower education level
- Use of sedation/analgesia in ICU
- Deep sedation in ICU



Clinical Picture

- Newly present or worsened after critical illness
 - Generalized weakness
 - Fatigue
 - Reduced mobility
 - Depression/Anxiety
 - Sexual dysfunction
 - Sleep abnormalities
- Cognitive issues
 - Memory issues
 - Slowed processing
 - Poor concentration

Definitions & Pathophysiology

Physical

- **ICU-AW:** acute & symmetric motor weakness in the extremities
 - Due to: critical illness polyneuropathy (CIP), critical illness myopathy (CIM), critical illness neuromyopathy (CINM) and muscle deconditioning
 - Diagnosis: grading of all testable upper and lower extremity muscle groups on scale of 0-5; if sum < 48 on 2 occasions separated by 24 hours, + ICU-AW
 - CIP most common
 - Multifactorial pathogenesis:
 - Catabolism, immobility, microvascular ischemia → muscle wasting
 - Microvascular injury/nerve ischemia/dysfunction of Na⁺ channels → CINM +/- CIM
 - Major contributor to prolonged ventilation, increased LOS in ICU & hospital and mortality

Definitions & Pathophysiology

Psychological

- **Psychological impairments:**
 - Depression, anxiety, PTSD most common
 - Depression 30%
 - Anxiety 70%
 - PTSD up to 50%
 - Female gender associated with increased risk of PTSD
 - Pre-existing depression, anxiety, PTSD, lower education level, ETOH abuse also increase risk

Definitions & Pathophysiology

Cognitive

- **Cognitive impairments:** memory loss, reduced executive function, language deficits, attention deficits & diminished visual-spatial abilities
- No specific pathophysiology identified
- Goes hand-in-hand with ICU delirium (becomes more likely the longer the episode)
- Pre-existing cognitive dysfunction, fluctuations in serum glucose are risk factors

PICS-F

- Psychological impact on families of patients who have survived critical illness
- Risk factors:
 - Female sex
 - Younger family member & patient age
 - Lower education level
 - Spouse is the patient
 - Single parent of critically ill child

Prevention

During ICU stay:

- ABCDE bundle
- Avoidance of hyper-hypoglycemia
- Nutrition support
- ICU diaries

After ICU stay

- Support groups
- Ward visits
- ICU-recovery clinics

PICS Treatment

ABCDE bundle

The ABCDE bundle for ICU/delirium also applies to PICS prevention

- A:** Awakening
- B:** Breathing
- C:** Communication & coordination of care
- D:** Delirium assessment/prevention/management
- E:** Early mobility
- F:** Family engagement and Empowerment

Deeper dive: ABCDEF bundle

- Awakening
 - Light or minimal sedation in place of "old school" heavy hand to help maintain sensorium/limit hallucinations
- Breathing
 - Ample spontaneous breathing trials to facilitate vent weaning and maintain muscle
- Coordination of care & communication
 - Among disciplines and with family
- Delirium assessment/prevention/management
 - Higher risk of PICS in patients with delirium
- Early mobilization/ambulation in ICU
 - Engaging PT and PM&R early may help with ICU-AW
- Family engagement and empowerment

Nutritional support

- Catabolism is associated with higher mortality in ICU patients
- Adequate energy + protein necessary for synthesis of muscle
- Nutrition + rehab/therapy key for maintenance of muscle
- Amino acids also essential piece
- More study needed to uncover best practices for building muscle in setting of prevention of ICU-AW/PICS

Tailoring of the environment

- Significant relationship between ICU noise/light and delirium
- ICU noise has impact on quality of sleep in post-surgical patients
- Earplugs reduce risk of delirium in ICU patients
- Since delirium is associated with long-term cognitive deficits, it is possible that improving sleep quality by tailoring the environment will help reduce delirium and in turn, long-term cognitive effects

ICU diaries

- Diary kept by healthcare team and family
- Details ICU stay and day-to-day activities
- Helps fill in the gaps in memory
- Helps establish factual "text" for memories

Ward visits

- Patient returns to ICU during recovery phase
- Allows him/her to observe the physical environment
- Helps patient separate fact from fiction
- May help reduce PTSD (dependent on patient)

Rehabilitation

ANALYSIS & PERSPECTIVE
Rehabilitation After Critical Illness in People With COVID-19 Infection

Robert Simpson, PhD, MChR, and Larry Robinson, MD

- Longitudinal process focused on minimizing disabling effects of an individual's impairments
 - Promoting/optimizing functional independence and ADLs, maximizing opportunities to participate in meaningful society on the basis of any new functional baseline
- Multidisciplinary rehab should start early in hospitalization (PT, OT, PM&R, SLP, RT)
 - Involve patients/family members in goal planning

Rehabilitation and COVID-19

- Focus on early active mobilization
 - Requires pre-planning for coordination of assessments, PPE requirements
- Transition to Floor
 - Mixed feelings – 'Greatest risk has passed,' yet patient still considered infected, hospital regulations require isolation from family
 - Considerable impairment related to prolonged sedation, immobilization, mechanical ventilation and delirium
 - High likelihood for emotional distress

Inpatient Rehab & COVID-19

- Inpatient rehabilitation required for many COVID-19 patients prior to discharge home
 - Limited bed availability
 - Need for established policies/procedures to limit spread amongst patients and healthcare workers
 - IP Rehab Patients will likely need longterm follow-up and care – Necessitates innovative models i.e. virtual rehab
- Healthcare Worker Wellness
 - Ensure wellness resources in place with existing evidence for effectiveness, including virtual mindfulness-based interventions, Schwartz rounds, etc
 - Work hours for parents with kids out of school, etc
 - Billing policies to minimize administrative burden

Follow-up Consults

- ICU-RC (ICU-Recovery Clinic)
 - Not widespread in US - No optimal model yet identified
 - Continuity of care
 - Education
 - Reassurance

Key Concepts for Moving Forward

- ⚠ Added importance on recognizing signs, symptoms and risk factors of PICS
- 🏥 Early rehabilitation with multi-disciplinary team
- 👨‍👩‍👧‍👦 Family involvement is crucial
- 🏠 Need for innovative care delivery models for expanded rehabilitation services

Thank you!

Questions?