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Post-Intensive Care Syndrome (PICS): A Concept Paper

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Abstract

Intensive care unit survivors are at risk of developing Post intensive care syndrome (PICS), which includes physical, psychological, and/or cognitive impairments. The prevalence of PICS in ICU survivors varies significantly, from 14.3% to 90%.The risk factors for developing PICS are varied and inconsistently defined across different studies, but they generally fall into two categories: pre-existing conditions (such as neuromuscular or neurological diseases, severe comorbidities, or psychiatric history) and ICU-related factors (such as the occurrence of delirium, the dosage of sedatives used, and conditions like acute respiratory distress syndrome (ARDS), sepsis, or dysglycemia). The most effective evidence-based practice strategy to reduce PICS is 'ABCDE' bundle.

Keywords: Post-Intensive Care syndrome, ICU survivors, psyc

Introduction

As survival rate increases, the emphasis on quality of life (QOL) after critical illness becomes increasingly vital. More than half of the patients surviving critical illness and experiencing ICU life suffer with Post-Intensive Care Syndrome (PICS), which encompasses a range of issues such as physical, cognitive, and psychological impairments, decreased quality of life, difficulties with daily activities, chronic pain, and other symptoms frequently seen after ICU stays. It is crucial for all healthcare professionals in ICUs, hospital wards, and community settings to be informed about this syndrome to deliver timely and appropriate care and interventions. [1]

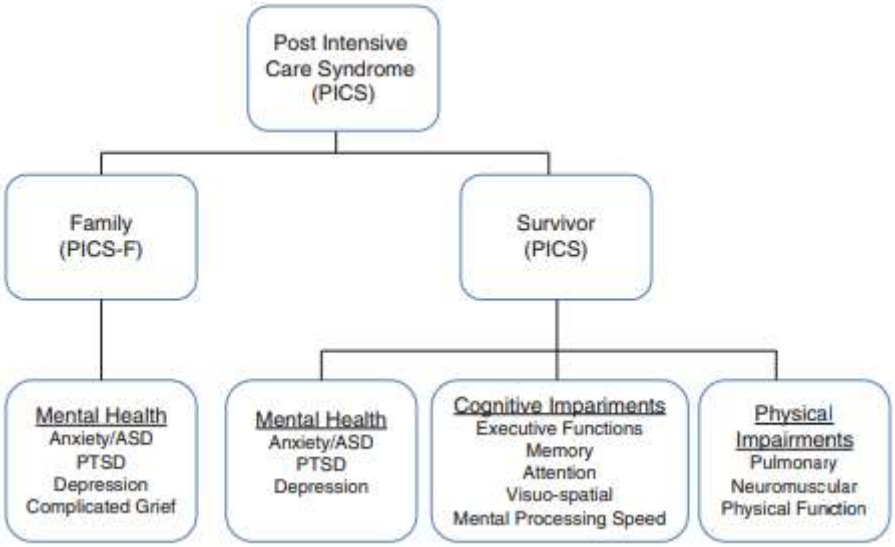

Fig. 1: Conceptual layout of PICS[2]

Prevalence

According to studies, the prevalence of PICS in ICU survivors varies significantly, from 14.3% to 90%. [3]. Ayenew T et al. (2025) conducted a systematic review and meta-analysis focused on understanding the prevalence of post-intensive care syndrome (PICS) among ICU survivors and its association with length of stay in the ICU. This systematic review was carried out in accordance with the "Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA)" (2020) criteria. Databases used for retrieving articles include PubMed/Medline, Embase, CINAHL, and Google Scholar. It was also noted how well the studies' methods were done and whether there were any limitations by using the Newcastle-Ottawa Scale (NOS). The prevalence of PICS and its association with ICU length of stay were estimated by using a random effects model with the I^2 test. This review included a total of 19 articles, with a cohort of 10,179 ICU survivors. Study findings revealed that the pooled prevalence of PICS was 54.35% (95% CI = 45.54, 63.15). Also revealed that the overall prevalence scores of physical, cognitive, and mental domains were 45.99%, 32.12%, and 32.36%, respectively. [4]

Risk Factors

PICS often manifests after a patient is discharged from the ICU, though its duration can be indefinite. The risk factors for developing PICS are varied and inconsistently defined across different studies, but they generally fall into two categories: pre-existing conditions (such as neuromuscular or neurological diseases, severe comorbidities, or psychiatric history) and ICU-related factors (such as the occurrence of delirium, the dosage of sedatives used, and conditions like acute respiratory distress syndrome (ARDS), sepsis, or dysglycemia). Additionally, the psychological well-being of the families and proxies of ICU survivors can be significantly impacted by the stress endured during the patient's critical illness, a condition known as PICS-Family (PICS-F). In a systematic review, results found that advanced age, female gender, duration of ICU stay, duration of mechanical ventilation, and duration of hospital stay were identified as key determinants associated with post-ICU quality of life (QOL). [5]

A study by Simon A. Amacher et al.[6] aimed to evaluate PICS at a 24-month follow-up, identify risk factors, and assess the long-term health-related quality of life in adult cardiac arrest survivors. This prospective cohort study involved adult survivors of cardiac arrest who were admitted to the ICU of a Swiss tertiary academic medical center. The main outcome was the prevalence of PICS at 24 months, defined by impairments in physical (measured via the EQ-5D-3L), neurological (Cerebral Performance Category Score > 2 or Modified Rankin Score > 3), and psychological (Hospital Anxiety and Depression Scale and Impact of Event Scale-Revised) domains. Out of 107 survivors who completed the 2-year follow-up, 46 (43.0%) exhibited PICS symptoms, with 41 (38.7%) experiencing physical symptoms, 16 (15.4%) psychological symptoms, and 3 (2.8%) neurological symptoms. Key risk factors for PICS identified in multivariate analyses included female gender (adjusted odds ratio [OR] 3.17, 95% CI 1.08 to 9.3), longer duration of cardiac arrest without blood flow (minutes) (OR 1.17, 95% CI 1.02 to 1.33), job loss after discharge (OR 31.25, 95% CI 3.63 to 268.83), need for ongoing psychological support (OR 3.64, 95% CI 1.29 to 10.29), psychopharmacologic treatment (OR 9.49, 95% CI 1.9 to 47.3), and lower scores on the EQ-visual analogue scale (OR 0.88, 95% CI 0.84 to 0.93). More than one-third of cardiac arrest survivors experienced PICS symptoms two years post-resuscitation, predominantly in the physical and psychological domains. Nonetheless, these long-term survivors reported a health-related quality of life comparable to the general population. Future studies should concentrate on effective prevention, screening, and treatment strategies for PICS in cardiac arrest patients.

Clinical Presentation

Patients who are discharged from intensive care are at risk of developing PICS, which includes physical, psychological, and/or cognitive impairments. There may be a complex interaction between these domains, with deficiencies in one area frequently affecting and coexisting with deficiencies of other areas. [7]

Physical Domain:

As many as 80% of patients who endured the ICU stay experience new physical dysfunction after discharge. The types of physical impairments vary and include ICU-acquired weakness (ICU-AW), impaired pulmonary function, and cachexia. People who are critically ill lose about 2% of their muscle mass in the first week, which predisposes them to persistent weakness. ICU-AW, defined as neuromuscular dysfunction with no reasonable cause other than critical illness and its treatment, often is the result of critical illness-related myopathy, polyneuropathy, or a combination of both. Nearly half of patients who survive the intensive care unit have this category of illnesses, which can show themselves in a number of ways, such as decreased exercise tolerance, contractures, weakness, and impaired mobility. [7]

Psychological Domain

Adverse psychological sequelae such as anxiety, depression, and PTSD are common after critical illness, with reported prevalence of 62%, 36%, and 39%, respectively. Patients who survive the Intensive Care Unit are also at increased risk of suicidal or self-harm behaviors compared with hospital survivors who never required ICU admission. Moreover, sleep disturbances are common after an intensive care unit stay, occurring in up to 57% of patients 6 months after hospitalization, and are often related to ongoing psychological disturbances.

Symptoms can include sleep onset or maintenance insomnia, fatigue, and nightmares. Chronic sleep deprivation can worsen anxiety and depression. Mental health problems can persist for months to years and can result in disability as well as reduced health-related quality of life (HRQOL).[7] Post-ICU psychiatric issues often coexist with other health problems, complicating both physical and cognitive recovery. Recent studies have shown a significant association between psychiatric morbidity and functional and physical impairment, pain, social functioning, and quality of life.[8,9]

Cognitive Domain:

Survivors of critical illness are more vulnerable to cognitive impairments regardless of comorbidities, preexisting conditions, and age. Cognitive dysfunctions may be both persistent, with one-third of patients who survive the critical illness exhibiting deficits one year after ICU admission, and severe, reflecting the degree of impairment seen in moderate traumatic brain injury and Alzheimer's dementia. Clinical manifestations may include a decline in memory, mental processing speed, executive function, attention, and concentration, all of which collectively can prohibit individuals from engaging in the purposeful, goal-directed behavior needed to carry out day-to-day activities and get back to their premorbid functional status. Obviously, cognitive deficit after an ICU stay is associated with reduced health-related quality of life (HRQoL), return to work, and independence. [7]

Assessment

Accurately estimating the prevalence of PICS is challenging due to the lack of standardized assessment tools (Table 1)[10]. However, it is noted that over half of ICU survivors exhibit at least one symptom related to cognitive, physical, or psychological impairment.

Table 1: Instruments utilized to evaluate patients with PICS for mental health, cognitive function, physical function, and quality of life [10]

Physical Function
Timed Up-and-Go (TUG)
Handgrip strength
2-Minute Walk Test (2-MWT)
Short Physical Performance Battery (SPPB)
Comprehensive Geriatric Assessment (CGA)
Medical Research Council scale for muscle strength (MRC)
Health-Related Quality of Life (HRQOL)/Subjective Health
European Quality of Life 5 Dimensions 5 Level (EQ-5D-5L)
Subjective concern
WHO Disability Assessment Schedule (WHODAS) 2.0
World Health Organization Quality of Life (WHOQOL)-100 and (WHOQOL)-Bref
RAND corporation tool for HRQOL (RAND 36)
36-Item Short Form Survey (SF-36)

Activities of Daily Living and Instrumental Activities of Daily Living (ADLs and IADLs)
Functional Independence Measure
Healthy Aging Brain Care Monitor Self Report version (HABC-MSR)
Cognition
MiniCog
Animal Naming
Repeatable Battery for the Assessment of Neuropsychological Status (RBANS)
Trail Making Test (TMT) A, B
Mini-Mental State Exam (MMSE)
Wechsler Adult Intelligence Test-Revised
Wechsler Memory Scale-Revised
Rey Auditory-Verbal Learning Test
Rey-Osterrieth Complex Figure Test
Oklahoma Premorbid Intelligence Estimation method (OPIE)
Verbal Fluency test
Logical memory, Visual Reproduction, and Adult Video Learning Test (AVLT)
Short Test of Mental Status, Modified Hachinski Scale, Prime MD
Picture Completion, Block Design
Boston Naming Test, Category Fluency
Mental Health
Depression
Centre for Epidemiologic Studies Depression (CES-D)
Beck Depression Inventory
Geriatric Depression Rating Scale-Short Form (GDS-SF)
Anxiety
Generalized Anxiety Disorder Scale (GAD)
Beck Anxiety Inventory
State-Trait Anxiety Inventory (STAI)
Post-Traumatic Stress Disorder
Impact of Event Scale-revised (IES-R)
Post-Traumatic Stress Disorder Checklist for a Specific event (PCL-S)
Post-Traumatic Stress Disorder Check List Civilian version (PCL-C)
Clinician-Administered Post-Traumatic Stress Disorder Scale (CAPS)
Davidson Trauma Scale (DTS)
Posttraumatic Stress Diagnostic Scale (PDS)
Post-Traumatic Stress Syndrome Question Inventory (PTSS)
Global

Patient Health Questionnaire (PHQ)—various versions
Depression Anxiety and Stress Scales instrument (DASS-21)
Hospital Anxiety and Depression Scale (HADS)
Structured Clinical Interview for DSM-IV (SCID)

Prevention

The most important preventive strategies found to have a positive impact in preventing the PICS-related long-term functional disabilities include limiting the use of deep sedation and encouraging early mobility in the ICU patients, along with consistent physical and occupational therapy. The most effective evidence-based practice strategy to reduce PICS is the 'ABCDE' bundle. [8] A bundle is a small collection of evidence-based practices that, when performed collectively and consistently, have been proven to improve patient outcomes. [11]. This approach comprises the following:

Awakening (using low sedation)

Breathing (Spontaneous breathing trials)

Coordination of care

Delirium monitoring and management

Early mobility and exercise

Additional Interventional strategies to prevent Post-intensive Care Syndrome (PICS) include,

1. Rapid correction of hypoglycemia and hypoxia.
2. Maintaining ICU diaries— Keeping an ICU diary reportedly benefits patients and family members at risk of PTSD. Intensive care unit diaries have been found to alleviate anxiety and depression, reduce the occurrence of PTSD and improve health-related quality of life after critical illness
3. Provide counselling and support to the patients and family.
4. Maintaining healthy dietary balance and adequate sleep of the patient.

Conclusion

The mortality rate of ICU patients has markedly decreased in recent decades; nonetheless, post-admission morbidity continues to be a substantial concern. Specific preventive strategies during ICU admission and subsequent rehabilitation efforts demonstrate potential in mitigating cognitive, psychological, and physical impacts in ICU survivors. Health care professionals who assess ICU survivors urgently require awareness of how to recognize and address PICS deficiencies. Further efforts are required to standardize follow-up strategies, and prioritizing the prevention of cognitive, physical, and psychological sequelae resulting from the ICU is imperative.

Reference

1. Hiser S L, Fatima A, Ali M, Needham D M. Post-intensive care syndrome (PICS): recent updates. *Journal of Intensive Care, 2023; 11*(1), 23.
2. Ryu J H, Kredentser M S, Bienvenu O J, Blouw M, Sareen J, Olafson K, et al. Post-traumatic stress disorder in survivors of critical illness. *Comprehensive guide to post-traumatic stress disorders*.2016; 263-280.
3. Weidman K, La Fond E, Hoffmann K L, Goyal P, Parkhurst C N, Derry-Vick H et al. Post-intensive care unit syndrome in a cohort of COVID-19 survivors in New York City. Ann Am Thorac Soc.2022; 19(7); 1158-68.
4. Ayenew T, Gete M, Gedfaw M, Gete A, Afenigus A D, Edmealem A et.al. Prevalence of post-intensive care syndrome among intensive care unit survivors and its association with intensive care unit length of stay: Systematic review and meta-analysis. PLoS One.2025 May 8; 20(5): e0323311.
5. Jiang W, Ni Q, Zhang C, Dong Y, Yi J, Yan R et.al Factors influencing Quality of Life After Intensive Care; A systematic Review and Meta- Analysis. Critical Care Medicine.2025; 53.9: e1803-e1814.
6. Amacher, S. A., Sahmer, C., Becker, C., Gross, S., Arpagaus, A., Urben, T., ... & Hunziker, S. (2024). Post-intensive care syndrome and health-related quality of life in long-term survivors of cardiac arrest: a prospective cohort study. *Scientific Reports*, *14*(1), 10533.
7. Schwitzer E, Jensen K S, Brinkman L, Defrancia L, VanVleet J, Baqi E, Aysola R et.al. Survival≠ Recovery: A Narrative Review of Post-Intensive Care Syndrome
8. Rawal G, Yadav S, Kumar R. Post-intensive Care Syndrome: an Overview. J Transl Int Med,2017 Jun 30; 5(2):90-92.
9. Ramnarain, D., Pouwels, S., Fernández-Gonzalo, S., Navarra-Ventura, G., &Balanzá-Martínez, V. (2023). Delirium-related psychiatric and neurocognitive impairment and the association with post-intensive care syndrome—A narrative review. *Acta PsychiatricaScandinavica*, *147*(5), 460-474.
10. Vrettou C S, Mantziou V, Vassiliou A G, Orfanos S E, Kotanidou A, Dimopoulou I. Post-intensive care syndrome in survivors from critical illness including COVID-19 patients: a narrative review. *Life*, 2022; *12*(1), 107.
11. Resar R, Pronovost P, Haraden C, Simmonds T, Rainey T, Nolan T. Using a bundle approach to improve ventilator care processes and reduce ventilator-associated pneumonia. Jt Comm J Qual Patient Saf. 2005;31(5):243–248.