

Post-Intensive Care Syndrome (PICS-p): The Evolving Concerns of Pediatric Intensivists

Katherine V Biagas*

The Renaissance School of Medicine at Stony Brook University, Stony Brook, New York, USA

Corresponding author: Katherine V Biagas, The Renaissance School of Medicine at Stony Brook University, Stony Brook, New York, USA, E-mail: katherine.biagas@stonybrookmedicine.edu

Received date: 02-Jun-2023, Manuscript No. IPJNN-23-13793; **Editor assigned:** 06-Jun-2023, PreQC No. IPJNN-23-13793 (PQ); **Reviewed:** 20-Jun-2023, QC No IPJNN-23-13793; **Revised:** 27-Jun-2023, Manuscript No. IPJNN-23-13793 (R); **Published:** 04-Jul-2023, DOI: 10.4172/2171-6625.23.S7.005

Citation: Biagas KV (2023) Post-Intensive Care Syndrome (PICS-p): The Evolving Concerns of Pediatric Intensivists. J Neurol Neurosci Vol.14 No.S7:005

Description

In 1983, Pediatric ICUs became officially recognized by the AAP and SCCM as discrete specialty units dedicated to the care of critically ill infants and children [1,2]. Initial focus was on establishing places where children with acute life-threatening conditions received highly specialized care [3]. In one report, 10% of children died during PICU hospitalization with another 10% dying after PICU stay. Functional outcome of survivors seemed rosy with 91% deemed “likely to be able to lead an independent existence” [4]. Over the next three decades, PICU survivorship dramatically improved to a mortality of 2% or less. The focus has changed to acquired morbidities and post PICU problems. Parents report problems with concentration, eating, sleeping, and behavior, delayed psychomotor development, temporary voice changes, withdrawal symptoms, and poor school performance [5,6]. The term Post Intensive Care Syndrome-Pediatrics (PICS-p) has been recently adopted.

In 2015, work began among 83 investigators of the POST-PICU group of the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) to characterize the existing literature of PICU survivorship. In a Scoping Review, 407 English language publications in the domains of Overall Health, Social, Cognitive, Emotional, Physical, Health-Related Quality of Life (HRQoL), and Family Functioning were identified [7]. Reflecting the increased appreciation in importance, 87% of these were published after 2000. Furthermore, a post-PICU Core Outcome Set (COS) was developed, using a modified Delphi process, with input from researchers, clinicians, and family advocates [8]. A COS of four Global Domains (Cognitive, Emotional, Physical and Overall Health) and four Specific Outcomes (HRQoL, Pain, Survival and Communication) were recommended. An Extended COS, including outcomes felt to be important by families, describe additional concerns in Overall Health, and Family, Emotional, and Physical Function [9].

Perhaps of greater interest to the readers of this journal is the experience in examining neurocognitive outcomes. In a second Scoping Review, we noted a lack of consensus as to methods and study designs. 114 instruments evaluated neurocognitive function in 183 manuscripts with, again, increased publication record since 2000 (83% of manuscripts). Final follow up varied

from 1 month to 3 years with studies variably anchored to date of admission or PICU or hospital discharge [10]. More than half of manuscripts focused on those with anticipated neurologic injury. Patients with congenital heart disease, traumatic brain injury, and cardiac arrest were most commonly evaluated [11].

Despite this literature record, two important areas of inquiry have been studied in only limited fashion. The first is whether neurocognitive deterioration after PICU stay is experienced by children with underlying neurologic conditions? There are suggestions that this may be the case. HRQoL among children with prior severe developmental disability deteriorates during the first year following septic shock [12]. In a single center study, only 21.4% of children with prior neurodevelopmental disabilities had good quality of life at 6 to 25 months after PICU discharge [13]. The second is whether there are correlates between adverse PICU events and subsequent neurocognitive dysfunctions? There is some evidence that those who are sickest, and perhaps those who experience adverse events, may experience neurodevelopmental or behavioural sequelae. In a state-wide database study, previously healthy children hospitalized with critical respiratory illness developed subsequent mental disorders or were prescribed psychotropic medications when compared with children who did not require mechanical ventilation [14]. In a multi-state database search, neurologic and functional morbidities were also more common in subjects receiving mechanical ventilation [15]. In children with critical illness-associated-hyperglycemia, the proportion of those with psychosocial impairment was greater in those who experienced any hypoglycemic event [11]. Finally, children with respiratory failure requiring mechanical ventilation had statistically lower scores than matched siblings on Wechsler Intelligence Subscales [16].

The evolving literature and the post-PICU COS suggest that adaptive behaviour and HRQoL may be the important measures of functioning in PICU survivors. In a single center study of 65 critically ill children, mean adaptive behaviour and quality of life ratings were moderately low and poor, respectively, compared with scale norms [17]. Moreover, worse adaptive behaviour performance was independently associated with pre-morbid neurologic functioning and ICU events such as prolonged cardiac compression [17]. In the final analysis, outcomes that seem to

be of real importance to PICU survivors and their families is how these children develop, adapt, and function in a complex world and how much residual conditions affect their overall health.

Consent for Publication

Not applicable

Funding

Not applicable

Conflicts of Interest

None

Off Label use Discussion

None

Author's Contribution

KVB conceived of the content, performed all literature searches, and all writing of the manuscript.

References

- Guidelines for pediatric intensive care units(1983) Committee on Hospital Care and Pediatric Section of the Society of Critical Care Medicine. *Pediatrics* 7:364-372.
- Guidelines and levels of care for pediatric intensive care units (1993) Committee on Hospital Care and Pediatric Section of the Society of Critical Care Medicine. *Pediatrics* 92:166-175.
- Pollack MM, Cuerdon TC, Patel KM, Ruttimann UE, Getson PR (1993) Pediatric intensive care units: Results of a national survey. *Crit Care Med* 21:607-614.
- Butt W, Shann F, Tibballs J, Williams J, Cuddihy L (1990) Long-term outcome of children after intensive care. *Crit Care Med* 18:961-965.
- Pollack MM, Holubkov R, Funai T, Clark A, Berger JT (2014) Pediatric intensive care outcomes: development of new morbidities during pediatric critical care. *Pediatr Crit Care Med* 15:821-827.
- Knoester H, Bronner MB, Bos AP, (2008) Surviving pediatric intensive care: physical outcome after 3 months. *Intensive Care Med* 34:1076-1082.
- Maddux AB, Pinto N, Fink EL, Hartman ME, Nett S (2020) Post-discharge outcome domains in pediatric critical care and the instruments used to evaluate them: a scoping review. *Crit Care Med* 48:e1313-e1321.
- Fink EL, Jarvis JM, Maddux AB, Pinto N, Galyean P (2020) Development of a core outcome set for pediatric critical care outcomes research. *Contemp Clin Trials* 91:105968.
- Fink EL, Maddux AB, Pinto N, Sorenson S, Notterman D (2020) A core outcome set for pediatric critical care. *Crit Care Med* 48:1819-1828.
- Biagas KV, Heneghan JA, Abu-Sultaneh S, Geneslaw AS, Maddux AB (2023) Scoping Review: Neurocognitive Outcome Assessments After Critical Illness in Children. *J Intensive Care Med* 38:358-367.
- Biagas, KV, Hinton VJ, Hasbani NR, Luckett PM, Wypij D (2020) Long-term neurobehavioral and quality of life outcomes of critically ill children after glycemic control. *J Pediatr* 218:57-63.
- Meert KL, Reeder RW, Maddux AB, Banks R, Berg R (2021) Health-Related Quality of Life after Community-Acquired Septic Shock in Children with Pre-existing Severe Developmental Disabilities. *Pediatr Crit Care Med* 22:e302-e313.
- Mestrovic J, Kardum G, Sustic A, Polic B, Mestrovic M (2007) Neurodevelopmental disabilities and quality of life after intensive care treatment. *J Paediatr Child Health* 43:673-676.
- Geneslaw AS, Lu Y, Miles CH, Hua M, Cappell J (2021) Long-term increases in mental disorder diagnoses after invasive mechanical ventilation for severe childhood respiratory disease: A propensity matched observational cohort study. *Pediatr Crit Care Med* 22:1013-1025.
- Shein SL, Slain KN, Clayton JA, McKee B, Rotta AT (2017) Neurologic and functional morbidity in critically ill children with bronchiolitis. *Pediatr Crit Care Med* 18:1106-1113.
- Watson RS, Beers SR, Asaro LA, Burns C, Koh MJ (2022) Association of acute respiratory failure in early childhood with long-term neurocognitive outcomes. *JAMA* 327:836-845
- Ebrahim S, Singh S, Hutchison JS, Kulkarni AV, Sananes R (2013) Adaptive behavior, functional outcomes, and quality of life outcomes of children requiring urgent ICU admission. *Pediatr Crit Care Med* 14:10-18.