



## INCIDENCE AND CLINICAL PROFILE OF PROLONGED ICU STAY PATIENTS.

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**ABSTRACT**

Incidence and Clinical Profile of PICUS (Prolonged Intensive Care Unit stay) patients.

**Objectives:** To study the incidence, clinical profile and outcomes of patients with chronic critical illness admitted to our ICU.

**Materials and Methods:** Retrospective analysis of patients admitted to our adult ICU during last 2 years. All patients with ICU stay > 21 days were included in the study. PICUS patients were classified according to their location in ICU and reason for ICU admission, as medical or surgical PICUS patients. The main endpoints of the study were ICU and hospital length of stay (LOS), and mortality.

**Results:** Of the total 3538 patients admitted to the ICU during the period of study, 67 patients had chronic critical illness & PICUS for an incidence of 1.9%. The mortality for medical and surgical PICUS patients was 50% and 44%, respectively (p=0.08).

**Conclusions:** A small component of critically ill patients admitted to ICU will turn into PICUS patients, requiring ICU care for a longer period of time. PICUS patients due to surgical indications for admission to ICU have longer ICU and hospital LOS but no significant increase in mortality.

**KEYWORDS :** CCI- chronic critical illness, MV- mechanical ventilation, PICUS – prolonged ICU stay

**INTRODUCTION:**

A growing population of patients survive acute critical illness only to become chronic critically ill (CCI). Chronic critical illness should be considered a more complex syndrome characterized by physiological, metabolic, immunological, neuroendocrine and neuromuscular disturbances. CCI patients were defined as patients who remained in the ICU for over 21 days due to the need for mechanical ventilation or hemodynamic support. The CCI are expected to increase, since more patients with complex diseases survive due to advances in resuscitation techniques, mechanical ventilation protocols, metabolic control and treatment of sepsis. This prolonged stay in the ICU may increase mortality or result in slower recovery with cost of their care being high. Since studies about this group of patients were scarce, there is a growing need to continue research on them.

**AIM:** To study the incidence and clinical profile of patients with chronic critical illness (CCI) in a teaching hospital in Pune.

**MATERIALS & METHODS:** This is a retrospective analysis of patients admitted to the adult ICU (total- 40 bedded; 20 bed medical plus cardiac ICU, 20 bed surgical ICU) in the past two years at Smt Kashibai Navale Hospital, Pune. All patients with ICU stay >21 days (due to mechanical ventilation and/or haemodynamic monitoring) were included in the study. CCI patients were classified according to their location in ICU and reason for ICU admission, as medical or surgical CCI patients. The following variables were studied: age, gender, diagnosis at admission, pre-ICU length of stay, previous chronic disease (COPD, IHD, CRF, stroke, myopathy, malignancy, etc), VAP, CAUTI, wound and other infections. The main endpoints of the study were ICU and hospital length of stay (LOS), and mortality

**TABLE 1**

Total no of patients admitted in ICU in past 2 years	3538
Stay in ICU < 48 hours	2441
Stay in ICU > 48 hours	1097
Acutely ill	1033

**TABLE 2: DEMOGRAPHIC CHARACTERISTICS**

	MEDICAL	SURGICAL
Mean Age in years	54.82	55.33

18-40 YRS	29.41%	20%
41-60 YRS	11.76%	33.33%
>60	58.82%	46.66%
GENDER MALE	73.33%	58.82%
FEMALE	26.66%	41.17%
PREVIOUS CHRONIC DISEASE	41.17%	33.33%

**RESULTS:**

Of the total 3538 patients admitted to the ICU during the period of study, 1097 patients had stay in ICU >48 hrs & 67 patients had stay > 21 days so were included in the study, for an incidence of 1.9% (medical CCI patients -1.2%; surgical CCI patients -2.4%). The most common diseases at ICU admission were stroke and neuromuscular disease in medical CCI patients and intestinal diseases (obstruction or perforation) in surgical CCI patients. Mean LOS (length of stay) in ICU for medical and surgical CCI patients was 26.6 and 33.6 days, respectively for a p value of <0.001. Mean LOS in hospital for medical and surgical CCI patients was 28.5 and 39.2 days, respectively for a p value of < 0.001. The mortality for medical and surgical CCI patients was 50% and 44% respectively (p=0.08).

**DISCUSSION:** The main goal of this study was to find out the incidence and the clinical characteristics of PICU & CCI in a general ICU. The most characteristic clinical feature of CCI is a prolonged requirement for mechanical ventilation.[2] Other features include profound weakness associated with critical illness polyneuropathy, increased susceptibility to infection, hormonal changes & delirium. Definition of CCI is the requirement for mechanical ventilation for 21 days or more. In our study it was found that of total 1097 patients who required ICU stay >48 hrs, 67 patients are of CCI, Incidence of 6.1%. (medical CCI -4.6%, Surgical CCI -7.9%) It is found in some studies that 5-10% of patients who require mechanical ventilation as part of their initial illness, will go on to develop chronic critical illness. [2] Overall prevalence has been estimated at 34.4 per 1,00,000 population.

**Following an acute critical illness there are 3 outcomes:**

- Recovery (complete or incomplete)
- Death during the acute illness
- Progression to persistent or chronic critical illness

In 2015 Iwashyna et al proposed that CCI may be better viewed as a syndrome, with 5 categories:

- Persistent critical illness
- Medically complex patients
- Diseases with long intrinsic recovery times e.g. Guillain-Barre Syndrome
- Prolonged ventilator weaning which is defined as “patients who were eligible for a spontaneous breathing trial (SBT), but for whom the SBT failed at least three times over the course of 7 or more days”
- Prolonged ICU length of stay (LOS)
- In 2010 Nelson characterised Chronic critical illness (CCI) syndrome as:
- Preceding acute critical illness, usually with at least one episode of sepsis
- Prolonged mechanical ventilation
- ICU-acquired weakness
- Neuroendocrine dysfunction
- Malnutrition
- Vulnerability to infection
- Skin breakdown
- Other Symptoms like pain, thirst, dyspnea, depression, anxiety, and inability to communicate)

The present study has some limitations. Patients with CCI who survived were not followed-up to monitor the outcome over a long period after hospital discharge. Sleep or psychiatric disorders were not assessed in this protocol, which could have an impact on the course and outcome of CCI. Patient's distress and family burden were also not studied. Finally, this study was only conducted at a single center.

#### CONCLUSIONS:

A small component of critically ill patients admitted to ICU will turn into chronic critically ill patients, requiring ICU care for a longer period of time. CCI patients having surgical indications for admission to ICU, have longer ICU and hospital LOS, but no significant increase in mortality. More and larger studies are required to further analyse the CCI patients.

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