Post intensive care syndrome prevention and impact of COVID 19

Alefragkis D.* A, B, D, E, F, Satolia K. D, E, Poulou G. E, F

Intensive Care Unit, General Hospital of Nikaia, Piraeus "Agios Panteleimon" Greece

A- Conception and study design; B - Collection of data; C - Data analysis; D - Writing the paper; E- Review article; F - Approval of the final version of the article; G - Other (please specify)

ABSTRACT

In recent years, there has been a maximum increase in admissions to the intensive care unit, culminating in an exponential increase in admissions during the COVID 19 pandemic. Many patients who survived and were discharged from the intensive care unit have cognitive, physical, and psychological disorders that are reflected in the term post-intensive care syndrome. Patients and their families show symptoms of anxiety, depression, post-traumatic stress, and sleep problems. The result is that they negatively affect their quality of life. Numerous risk factors contribute to the development of this syndrome, mainly the sedation, the duration of mechanical ventilation, and the length of stay in the intensive care unit. For this reason, it is necessary to take measures to prevent this syndrome including ABCDEFGH care plan, physical rehabilitation, nutritional support, and intensive care unit diaries. Care must also be given to the creation of Post Intensive care unit clinics where they have a diagnostic, therapeutic, counseling, and rehabilitation role that will act as assistants in the care of patients after discharge from the intensive care unit. Also, special care should be taken with patients who have recovered from COVID 19 whose needs are increasing and need immediate treatment. This review aims to analyze post-intensive care syndrome, prevention measures, and the impact of COVID 19. In conclusion, it is necessary to take measures to treat post-intensive care unit syndrome with early diagnosis and treatment, to reduce the adverse effects on both patients and their families. Keywords: COVID 19, post intensive care syndrome, intensive care unit, prevention

DOI:

Corresponding author*
Alefragkis Dimitrios
Address: General Hospital of Nikaia, Piraeus "Agios Panteleimon" 18454 Piraeus, Greece
Tel:+30 6989408117
e-mail: Jimale97@hotmail.gr

Received: 20.01.2021
Accepted: 12.03.2021
Progress in Health Sciences
Vol. 11(1) 2021 pp 112-117
© Medical University of Białystok, Poland
INTRODUCTION

In the last 15 years, the aging of the population has led to an increase in admissions to the intensive care unit while increasing its survivors. Although remarkable steps have been taken in the treatment of seriously ill patients, much returns to the pre-admission functional and cognitive level. A significant proportion of these patients, however, present with functional, cognitive, and psychological disorders for a long time after the discharge from the intensive care unit. At this time, when globally humanity is facing the pandemic of the COVID-19 virus infection many patients need hospitalization and 20-30% end up in the intensive care unit. Among COVID-19 intensive care unit patients, 60% survive to return home [1-2]. All survivors are likely to experience the same short- and long-term effects on respiratory function, overall functional capacity, and quality of life, including post-intensive care unit syndrome (PICS) [3-4].

Patients with COVID-19 who have been treated in the intensive care unit and have survived may be at higher risk of developing post intensive care syndrome due to factors such as limited social support, prolonged mechanical support time, high doses of sedatives, and limited physical therapy by health professionals with the patient during and after hospitalization due to the risk of disease transmission [5-6]. Thus, due to the pandemic, several measures have been imposed to limit the spread of the virus, which on the one hand act beneficially, and on the other hand the way of providing health care has changed, especially to patients with chronic diseases and those who need rehabilitation after their hospitalization in the intensive care unit because many health centers have limited personal protective equipment and high risk of transmission to caregivers, with patients having limited access in health care resulting in exacerbation of post-intensive care syndrome with consequences for patients and their families [7].

POST INTENSIVE CARE SYNDROME AND IMPAIRMENTS

In the United States each year, out of 5 million patients treated in the intensive care unit, 50% to 70% will develop post intensive care syndrome. In this syndrome, there is a decrease in the overall functionality of the patient, or deterioration of the previous functionality, after hospitalization in the intensive care unit and includes a combination of physical, cognitive, and mental disorders that may appear in just 2 days after a patient receives critical care and can affect the patient's family [8-9]. In the families of surviving patients, the consequences of post intensive care syndrome create a posh of adverse psychological reactions that include anxiety, depression, acute stress disorder, post-traumatic stress disorder (PTSD), and sophisticated mourning called post-intensive care syndrome-family (PICS-F) [10].

The incidence of physical impairments ranges from 25-80% and is more easily recognizable and obvious to cognitive and mental disorders. A major proportion of patients entering the intensive care unit, including patients with COVID-19, require long-term stays due to their need for mechanical respiratory support with increased ventilator volume pressures. Release from the ventilator becomes difficult resulting in the formation of tracheostomies causing feeding and speech problems. Thus the increase of dense sputum, with absent or reduced cough force makes it difficult to restore their pulmonary function [11]. Also, severely ill patients present with Intensive care unit-acquired weakness-(ICU AWs) which includes symmetrical weakness, damage to peripheral nerves and muscles, reduction or absence of tendon reflexes as well as possible loss of sensitivity to painful stimuli. Risk factors for physical impairments are systematic inflammatory response syndrome, sepsis, gram (-) bacteremia, hyperglycemia as well as prolonged sedation and bed rest resulting in increased mortality, length of stay but also reduced functionality and quality of life up to 2 years after discharge from the intensive care unit [12-13].

Cognitive impairments occur in more than 1/3 of severely ill people and affect one or more areas of perception, attention, concentration, memory, data processing speed, and executive ability. Their impact after leaving the intensive care unit ranges from 30-80%. Many patients report difficulties related to their experience in the intensive care unit, have difficulty to express themselves emotionally but also to focus on their daily activities [14-15]. Based on the hitherto poor data, the cognitive deficits remain 6 or more years after the patients leave the intensive care unit, as they are not recognized and are not rehabilitated in time [16]. Major risk factors for cognitive impairments include anxiety, depression, psychiatric syndromes, the presence and duration of delirium, hypoxemia, and depression. These cognitive deficits can be improved in the first year, however, after this period there is no further recovery [17-18].

The mental impairments which occur in patients with post intensive care syndrome are around 28% and are anxiety, depression, and posttraumatic stress disorder. Posttraumatic stress disorder includes disturbing memories that come from real events and are incorporated into distorted memories as a result of medication, anesthesia, or brain damage [8,14,19]. Risk factors for psychological impairments are hospitalization time, the onset of delirium during hospitalization, Acute Respiratory Distress Syndrome (ARDS), duration of mechanical ventilation, younger age, female gender, low educational level, and height [20-21].
RISK FACTORS FOR POST INTENSIVE CARE SYNDROME

Several factors contribute to the development of post intensive care syndrome which can be divided into two categories personal and those related to the intensive care unit [22]. Personal includes three subcategories of demographics: age, gender, nationality, living status, marital status, younger children, education, employment, socioeconomic status, career, social support, social issue, alcohol, smoking, illicit drugs, and physical activity. Another subcategory is the personality which includes personality, disease perception, attention, optimism, coping, and self-efficacy. The last subcategory of personal risk factors concerns the previous state of health which includes body mass index, hearing problems, vision problems, previous admission to the intensive care unit, quality of sleep before the intensive care unit, pre-existing weakness, previous trauma event, previous mental health problem, previous cognitive function, previous physical condition, and mental health. The category related to the intensive care unit includes the following subcategories: admission to the intensive care unit, intensive care unit's patient's treatment, and the patient experiences. More specifically, all these subcategories include emergency admission, intensive care unit type, hospital type, length of stay in the hospital and hospital, diagnosis, comorbidity, surgery, complications, disease severity, cardiovascular support, respiratory support, renal support. Also use of analgesics, muscle relaxants, sedatives, other drugs (steroids, inotropic, number of drug groups) and laboratory data, and vital signs. Finally, the patient experienced delirium, restraint, bed rest, device self-removal, and pain. In conclusion, the factors related to the intensive care unit are considered to be modifiable, so there the contribution of the health professional is necessary [9,22-23].

POST INTENSIVE CARE SYNDROME AND COVID 19

Patients with COVID-19 who have had to stay in the intensive care unit for a long time and have developed hypoxic respiratory failure, usually acute respiratory distress syndrome, and have been treated in the intensive care unit and survived may be at increased risk of developing post intensive care syndrome due to the high risk of being accompanied by prolonged mechanical ventilation with exposure to a higher amount of sedatives and limited physical therapy during and after hospitalization due to the high transmissibility of the virus [5-6]. Also due to the situation created as a result of the pandemic COVID 19 many rehabilitation centers become impossible to provide care to these patients because it is subject to restrictions on the one hand which is expressed by lack of personal protection measures and on the other hand, there is no proper management training of these patients. This results in a huge number of patients worldwide being left without care after leaving the intensive care unit, creating an incredible problem for post intensive care syndrome patients with over 3.6 million cases and more than 140,000 deaths in the United States alone due to COVID-19. The pandemic, therefore, leads to an exponential increase in rehabilitation needs, posttraumatic stress disorder rates, depression, substance use that has devastating consequences for the patient, family, and health professionals [2,5,7].

Because post intensive care syndrome is now increasing and will increase further, it is considered necessary to take measures and health policies to address it. The state should devise polarity but also allocate resources to facilitate - and outpatient interventions for intensive care unit survivors. After leaving the intensive care unit, these patients should go to specially designed rehabilitation centers due to the pandemic that will have the appropriate facilities and groups of health professionals well trained to develop strategies for the treatment of complications arising from intensive care unit accommodation. The profit will be huge because the specially designed rehabilitation centers can relieve the huge burden for the acute hospitals and take care of a significant number of patients so that the patients return to the stage they were in before the disease but also not burden the family [2,5,7].

The pandemic has also led to the rapid development, improvement, and further development of telemedicine which is the main pillar for patients and health professionals [7]. Tele-rehabilitation and virtual rehabilitation can evolve as the mainstay of health care delivery. Finally, with telemedicine and virtual reality, rehabilitation health professionals worldwide can develop skills to manage these patients, expand their knowledge, and devise a common plan for the treatment and rehabilitation of intensive care unit survivors with and without COVID-19. Therefore, the need to raise awareness for the rehabilitation of patients with COVID-19 after leaving the intensive care unit worldwide is enormous and should be given special weight to countries with major financial problems where the impact of the pandemic is maximum [24-26].

POST INTENSIVE CARE SYNDROME PREVENTION

Given the impact that post intensive care syndrome has on patients and their families, it is necessary to take measures aimed at preventing it and helping to improve the quality of life of patients
and their families [5]. These measures include the ABCDEFGH care plan, physical rehabilitation, nutritional support, and intensive care unit diaries [8,10]. The ABCDEFGH care plan is especially important to use daily in the intensive care unit because it addresses the risks of sedation, delirium, and immobility. This consists of A which includes airway management, pain assessment as well as sedation assessment in order for the patient to receive the minimum necessary. The B includes a daily check to see if the patient can be released from the ventilator, spontaneous breathing tests, sublingual aspiration, and an 8-hour check of the cuff pressure. D includes delirium assessment and prevention. E is about the early mobility of the patient with alternating positions, mobilization techniques, continuous rotational therapy, and electric neuromuscular stimulation. Early mobility is very important because studies have shown that it increased the number of days without the ventilator and reduced hospital readmissions [10,27]. Also, early mobility shortens both the stay in the intensive care unit and the hospital. Also, the additional strategies of the care plan are FGH that is, F follow-up referrals, functional reconciliation, and family involvement, G is about good handoff communication, and H includes information to hand to the patient and family. Finally, physical rehabilitation aims to improve the quality of life by maintaining, improving, and repatriating activities of daily living. Both intensive care unit - acquired weakness and post intensive care syndrome-related delirium significantly affect the quality of life. Thus physical rehabilitation is necessary with activities such as sitting, standing, and irritation, as well as passive exercises. Finally, physical rehabilitation can significantly improve the quality of life [27-28].

The nutrition support role is crucial for the prevention of post intensive care syndrome, especially for intensive care unit - acquired weakness. In particular, patients should receive adequate nutrition high in albumin which is an important factor for muscle composition, which due to the energy gap created leads the patient to catabolism resulting in increased risk mortality [20, 29]. Nutritional therapy also aims to increase the volume and strength of the muscles of patients with the result that the relationship between nutritional therapy and post intensive care syndrome is strengthened. Also, research has shown that the patient should not be malnourished but should receive adequate energy because overeating will worsen intensive care unit - acquired weakness [10, 29].

The intensive care unit diaries are of utmost importance for patient care, which has been used since the 1970s and 1980s by European Nordic countries. Their maximum advantage is that it is an inexpensive method that contributes significantly to improving the quality of life of patients surviving critical illness. The intensive care unit diary may be prescribed by a family member or medical professional as well as by the patient himself. Their role is to guide the patient to relieve anxiety, depression, and posttraumatic stress disorder symptoms thus preventing post intensive care syndrome. If deemed useful, the healthcare professional explains it to the patient and his family, and if consent is obtained, recording begins. Records include periodic general notes on events and daily occurrences, the patient's life, and recovery status. Finally, adherence to intensive care unit diary has been shown to help patients and their families significantly [10,27].

**POST INTENSIVE CARE UNIT CLINICS**

Post intensive care unit follow-up clinics are specialized clinics offered to patients who have survived and been discharged from the intensive care unit. Their role is diagnostic, therapeutic, counseling and they also contribute to the rehabilitation of patients. They are aimed at patients and their families and have gained a great deal of ground for the diagnosis and treatment of post intensive care syndrome. COVID-19 pandemic changed dramatically the healthcare landscape by significantly affecting patients' access to health services, its role is significant. Surviving patients and discharge of intensive care unit or COVID 19 intensive care unit should be referred to these clinics to contribute significantly to their rehabilitation through special programs aimed at treating post intensive care syndrome aiming at complete rehabilitation, autonomy, and improving the quality of life of patients. Finally, these clinics must be staffed by interdisciplinary teams of health professionals fully trained with their main concern patient care [5,10,30].

**CONCLUSIONS**

The time that humanity is going through with the crisis caused by the pandemic, many patients who have been ill or not with COVID 19 and have been hospitalized in intensive care units after their discharge are often neglected, resulting in an increasingly high morbidity group. Due to numerous risk factors during hospitalization in the intensive care unit, post intensive care syndrome is increasing rapidly and has a high cost. Thus, it is necessary for patients to be recognized immediately before the development of post intensive care syndrome and to be treated by applying best prevention practices, with an interdisciplinary team and to be referred to Post intensive care unit clinics aiming at the best quality of life. Also, the contribution of technology through the use of telemedicine, telenursing, and
Telerehabilitation will have a beneficial effect. In conclusion, each person is a separate biopsychosocial entity and his care should not be limited.

Conflicts of interest
None

Financial disclosure/Funding
None

ORCID
Alefragkis Dimitrios: 0000-0002-9370-6533

REFERENCES