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Letter to Editor

Malnutrition in COVID 19 Acute Respiratory Failure Patients. A Malnutrition Epidemic within a World Pandemic

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Patient: 10 random Covid 19 respiratory failure patients on Mechanical ventilation with ARDS.

Final Diagnoses: Malnutrition, Covid 19, Endemic, Pandemic, ARDS, Hypoxemia, Cyanosis.

Symptoms: Hypoxia, malnourishment, weakness.

Clinical procedure: Mechanical ventilation.

Specialty: Pulmonary and Critical Care Medicine

Objective: Unusual clinical course

MeSH Keywords: Sars-Cov2, hypoxemia, ARDS, Pneumonia, mechanical ventilation, pandemic, malnutrition.

As Intensive Care and Respiratory, physicians we have taken care of a large number of patients in respiratory failure due to COVID 19 infection in a short period of time. It has been my observation that their nutritional status is marginal at best, and it is compromised by many factors such as lack of available beds, hospitals being at capacity and limited resources in a pandemic scenario. At the time I am publishing this letter, we are in the middle of a mass casualty, a pandemic scenario where our ICUs and emergency rooms are being overrun by sick individuals. Currently, there are over 100,000 admissions in the United States to Intensive Care Units (ICUs) with each being over 100 % of capacity. This is a case review of 10 random patients in a normal day of work, determine their length of time to be fed, severity scores and overall condition. We will do a world literature search and incorporate nutrition recommendations to treat COVID-19 hypoxic, respiratory failure patients. These patients represent an epidemic of malnutrition in a worldwide pandemic. Malnutrition is an active problem in our ICUs. The focus for Intensivists and Respirologist has been acute resuscitation of patients with respiratory failure. Nutritional therapy also needs to be incorporated as an active modality in current treatment for patients with respiratory failure.

Background

Up to 10% of the Coronavirus SARS Co-V-2 infected patients present with acute respiratory failure requiring ICU admissions. Nutrition is an important element of any ICU patient's care and evolution. The coronavirus enters the cells of the respiratory and gastrointestinal track, undergoing a rapid viral replication. Causing systemic damage and chain reaction of cytokine release with proinflammatory cytokine storms.1 Attention to the gastrointestinal track in critical care patients has demonstrated to decrease translocation of bacteria and minimize morbidity in patents that are catabolic while in the ICU and lower the incidence of peptic ulcers. Nevertheless, we have been focusing on acute resuscitation of the patient when nutrition should also be an integral component of therapy. These patients with respiratory failure have a long time of recovery and nutrition for them is a key factor for ICU survival. A hospital length of stay of 2 to 3 weeks is common for these patients, then either going home or to a rehabilitation hospital. Most of these patients that present to the hospital have

other comorbidities which also contribute to reduced caloric intake including dyspnea, secondary infections, stress, confinement, depression and in some extreme cases lack of food. COVID ICU patients with infection, sepsis, physical immobilization, and hypermetabolism are exposed to rapid muscle wasting which can make malnutrition worse. Therefore, most patients admitted to the ICU with COVID-19 respiratory failure are at a high risk for malnutrition.

I am currently practicing intensive care medicine in a high-risk, high volume COVID intensive care unit in the United States. One of the biggest deficiencies we are seeing in the field is the incorporation of sufficient staff and staff shortage to evaluate nutrition. There is a shortage of registered nutritionist (RDN) to provide input on dietary care in rural communities. This additional insight would help maximize nutritional support and coverage of caloric intake for patients with high infection and high SOFA scores that are flooding our ICUs. Currently in our 30 bed ICU, we have had to triple our nursing staff, close all elective procedures and hold ICU level patients requiring high oxygen support outside the physical ICU. Due to the limited size of the ICU, these patients have been placed in holding areas such as medicine floors and emergency room beds. These patients during a non-pandemic peak meet admitting criteria for admission to an ICU, but due to lack of personnel, space, and resource we must bring the ICU to the Non-ICU floors to treat and support our community.

It is my intention to come up with a standard protocol for initiation of nutritional enteral feedings for patients with COVID 19. That can be implemented from their admission in the emergency room, as most of these patients wait in an emergency room gurney or worse become intubated and prone as they wait for a bed to become available. The plan would implement a standard set of feeding orders in a situation where our system does not have the human resource to have a formal RDN consultation or evaluation due to the large influx of patients. Keeping in mind that during COVID peaks and surges, most professionals outside of the ICU are not used to taking care of critically ill patients.

Proposal

A standard set of nutritional orders with guidelines for ICU patients with COVID 19 that can be started in the emergency room, holding area, non-ICU floor or ICU.

Goal

To show that nutrition is important to keep patients alive in a mass case scenario. Nutrition has taken a back burner position and we need to make a conscious effort to start feeding patients regardless of location. This should be prior to arriving to the ICU or having a formal RDN consultation. The recommendation and observation of this paper is to start enteral feedings to these patients at the current location of therapy prior to arriving to a physical ICU bed, RN or ICU doctor.

As part of this observation chart review of 10 random ICU patients were reviewed.

Results

Total amount of patient charts reviewed: 10.

Time from admission from the ER to physically admitted in the ICU.

Time from the ER to the time an order for nutrition was added by hospitalist

Patient	Time ER to ICU	Time for Nutrition Orders
1	15 hrs.	28 hrs.
2	17 hrs.	33 hrs.
3	19 hrs.	24 hrs.
4	37 hrs.	45 hrs.
5	42 hrs.	57 hrs.
6	52 hrs.	59 hrs.
7	34 hrs.	48 hrs.
8	44 hrs.	67 hrs.
9	57 hrs.	64 hrs.
10	62 hrs.	75 hrs.

Table 1

All patients were intubated, all patients had had bilateral infiltrates and required Roto prone, or manual proning, ventilation, low tidal volume high peep ventilatory strategy, antibiotics, steroids, vasopressors (at least one), central line, A line (Arterial line), paralytics and sedative, Diprivan drip, fentanyl drip and remdesivir. At the time of writing this paper the standard of care for Acute Respiratory Distress syndrome, ARDS, due to COVID 19.

All patients had a PaO^2/FIo^2 ratios less than 100 (severe Hypoxemia), bilateral lung infiltrates consistent with COVID pneumonia. All were in shock with multiorgan dysfunction, and with SOFA scores > 20.

None had orders for nutrition to be started until after reaching the ICU.

Age, vaccinated vs non vaccinated, Comorbid diseases, smoking, BMI.

Age	BMI	Vaccine	Comorbidities
47	34	No	Smoker, HTN, DM, COPD
53	37	No	Smoker, DM
57	39	No	Smoker, HTN, IBS, COPD
59	34	No	Smoker, ESRD, IBS
60	37	No	Smoker, ESRD CVA, HTN, DM
51	39	No	Smoker, ESRD CVA, HTN, DM
55	29	Yes	Lung cancers, COPD, HTN, DM
62	34	Yes	Colon cancer, COPD, HTN, DM
61	37	No	Smoker, HTN gastritis
55	35	No	Smoker, HTN, DM, GERD

Table 2

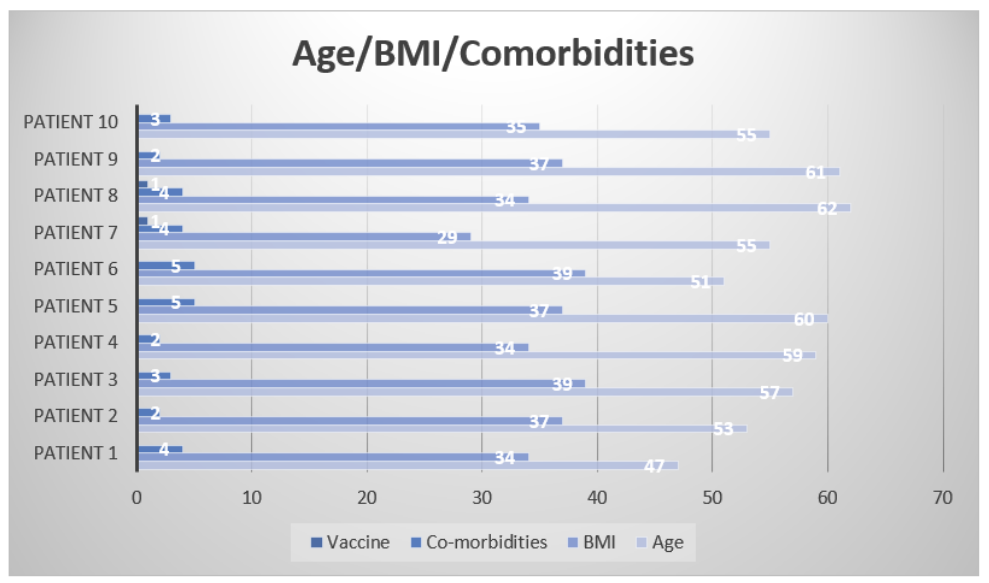

Figure 1

Observations

This is a normal day as COVID ICU doctor, I have more patients requiring higher level of care in contrast to the bed availability or ICU staff required to cover the high demand. Prompt feeding of patients in the ICU has been shown to decrease translocation of bacteria and diminish the long-term morbidity and mortality [10,11]. Most patients are not being fed due to many reasons, up to 3 or 4 days from admission. They may even have longer times, if you consider these patients have had symptoms for greater than a week and may have not eaten during that time before coming to the hospital.

Conclusions and Recommendations

COVID 19 patients admitted to ICU must be considered for malnutrition due to prolonged nil per os (NPO) status. Because of risk of viral transmission, high morbidity, high mortality, swelling in part from shock resuscitation and hypoalbuminemia create difficulty for an anthropometric evaluation.

During the current pandemic obesity and high BMI are associated with a severe form of COVID 19 [8]. In the ICU, obesity is associated with increased protein catabolism compared with non-obese patients. In obese ICU patients, rapid weight loss would be associated with an increased muscle mass loss, weakening the immune defenses, and therefore promoting COVID 19 severity [4]. Enteral nutrition should be preferred over peripheral nutrition and should be started as soon as the patient is evaluated by a clinician and before determining if ICU admission is needed. Retrospective studies have shown that early enteral nutrition in paralyzed patients was associated with less hospital mortality and there is no increase in ventilation associated pneumonia [5].

Evaluation for refeeding syndrome and complications of long-term use of propofol should be prevented [5]. The use of enteral feedings including the prone position should be performed using a pump with a flow regulator [7]. The use of Omega 3 fatty acids should be preferred in cases of ARDS [9]. After extubating patients, their nutritional support needs to be continued into the rehabilitation phase until the patient can have a normal oral intake.

On the Non intubated patients, the use of peripheral nutrition should be recommended. Many patients are using high flow oxygen systems and BIPAP, non-invasive ventilation. Reviewing the world literature in China, Spain and Italy [2], many were not fed for days, the loss of mass and weight has been associated with an increased mortality and morbidity. We propose starting enteral feedings at the time all ICU orders are entered and executed, disregarding the physical location of the patient to shorten the time these patients are underfed. Underfeeding and rapid loss of weight for these patients can be deleterious and can increase their overall mortality [3].

It is my hope that by presenting these finding to my colleagues we can make a significant contribution to the survival in the large number of COVID 19 patients we are seeing. By looking at all COVID 19 patients being admitted as being a potentially malnourish patient, we can hopefully change the culture and look at malnutrition in this population as a second epidemic that we can't ignore [2,3].

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