One Hospital's Perspective on Nutrition Support for COVID-19 Recovery

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As the UK went into lockdown in March 2020 and the daily admission rate of patients critically ill with COVID-19 began to rise at Frimley Park Hospital, Surrey, the staff sprang into action to ensure the best possible care was provided for these patients. The hospital swiftly increased the capacity of critical care beds and dietitians focused on the challenges they would face; initially providing crucial nutrition support to patients on the intensive care unit (ICU) and, subsequently, planning for what further nutrition support these patients would require post discharge. This article looks at the profile of the patients who were followed up after leaving the hospital and discusses the outcome data that was collected during their recovery phase.

Introduction

At the start of the COVID-19 pandemic, the initial focus of the dietetic team was, naturally, on the nutritional needs of the patients in ICU. However, in parallel to this, the importance of developing plans considering the needs of patients post discharge soon became apparent. But with so many unknowns, it was difficult to determine what support would be appropriate.

It was recognised that many of these patients would have spent extensive time in critical care beds, a well-documented cause of malnutrition, with loss of muscle mass and function long after ICU discharge.[1] Due to their intubation whilst in ICU, it was hypothesised that many patients would suffer from swallow issues for some time after discharge[1] and were therefore likely to require modified textures, putting them at further risk of malnutrition.

Older people and those with underlying health conditions, such as diabetes, chronic lung disease, chronic kidney disease (CKD) and cardiovascular disease, were more likely to be affected by COVID-19.[2] The nutritional status of these patient groups may already have been compromised prior to falling ill and so the support offered to these patients would need to encompass a wide range of factors.

Other issues included the fact that patients would potentially experience loss of taste and appetite, further compromising their nutritional intake. In addition to this, difficulties in accessing food could be a major problem for some patients.

Support provided to patients post discharge

In the absence of evidence-based guidance in this area, it was decided to follow up all COVID-19 positive patients who were known to the dietitians during their critical care stay. The aim was to evaluate their needs, in order to provide appropriate nutritional interventions to enable recovery and prevent re-admission to hospital. All home visits and face-to-face outpatient appointments had been suspended, so follow up reviews had to be carried out telephonically. Contacting patients 1-2 weeks after discharge gave the most accurate picture of how their recovery was going, as many saw a return of their appetite 3-4 days post discharge, and at this stage they were settling into a routine for their meals and starting to feel better.

The profile of patients followed up

Between the period of 9th April and 24th June 2020, 34 patients were followed up (28 males, 6 females). Ages ranged between 22-90 years. The single biggest group were in the age range 45-64 years (**Figure 1**). Twenty-nine (85%) patients were overweight or obese on admission (**Table 1**). All patients had at least one co-morbidity, with some having polymorbidity (**Table 1**).

Table 1: Relevant Co-morbidities of Patients

Relevant Comorbidity	Number of patients
Diabetes	11
Cardiovascular disease	18
Lung condition	8
Chronic kidney disease	2
Cancer	4
Body mass index (BMI) >25 on admission	29

Results & observations

The length of stay ranged from 7-65 days (median: 17 days).

Thirty-two (94%) patients had a reduction in BMI during their admission (**Figure 2**). The mean weight loss was 8% with a standard deviation of 5%.

Thirty-one (91%) patients had a reduction in haemoglobin (Hb) levels during their admission, with 23 (68%) deficient at discharge (**Figure 3**). Fatigue was an issue for many and, whilst this is normal following serious illness,[3] low Hb is likely to contribute to this.

Post discharge, all patients reported weakness in arms and legs and described their limbs as looking less muscular than previously. Being able to measure this was difficult as patients were not seen face-to-face and hand grip strength measurements could not be done. Patients were asked how many times they could go up one flight of stairs and how many minutes they could walk for per day.

In addition to weakness, patients presented with a range of symptoms, including shortness of breath on exertion, coughing, sore throat, fatigue, dysphonia, taste changes, nausea and reduced mobility.

Nine patients had a speech and language therapist (SLT) assessment during their admission and 2 were discharged on modified textures. Five had been discharged with a supply of oral nutritional supplements (ONS).

Figure 1: Age Range of Patients Broken Down by BMI on Discharge

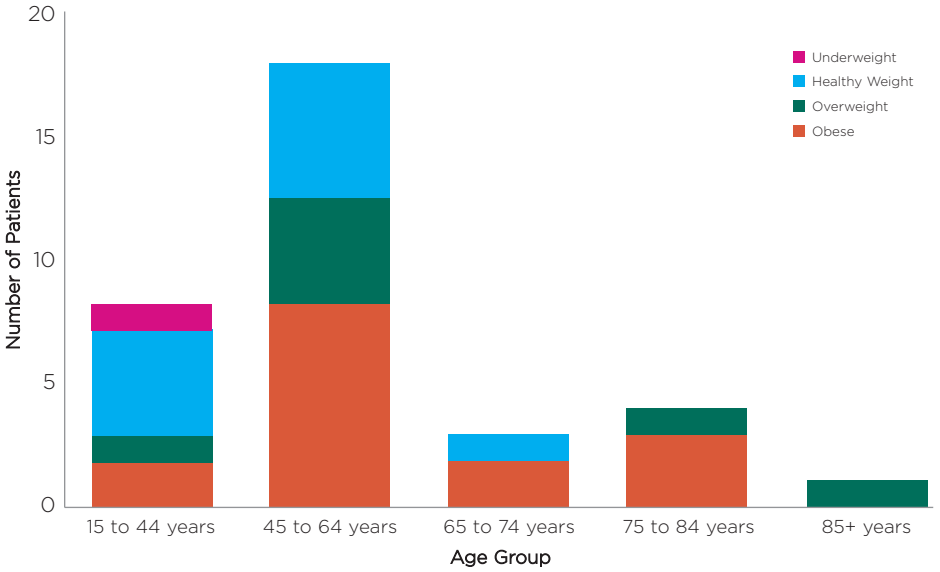


Figure 2: Changes in BMI between Admission & Discharge

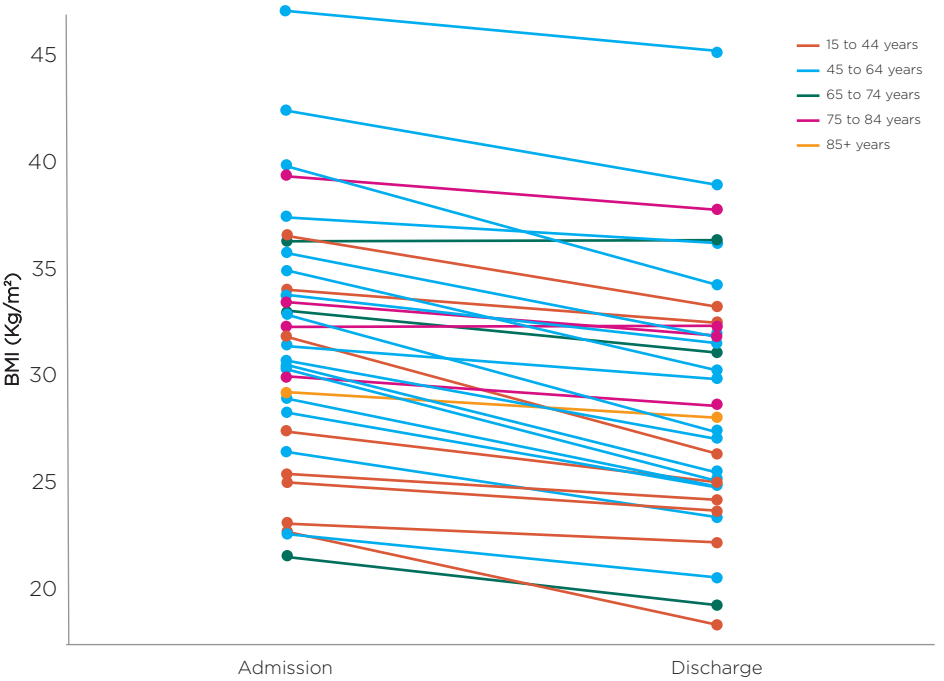
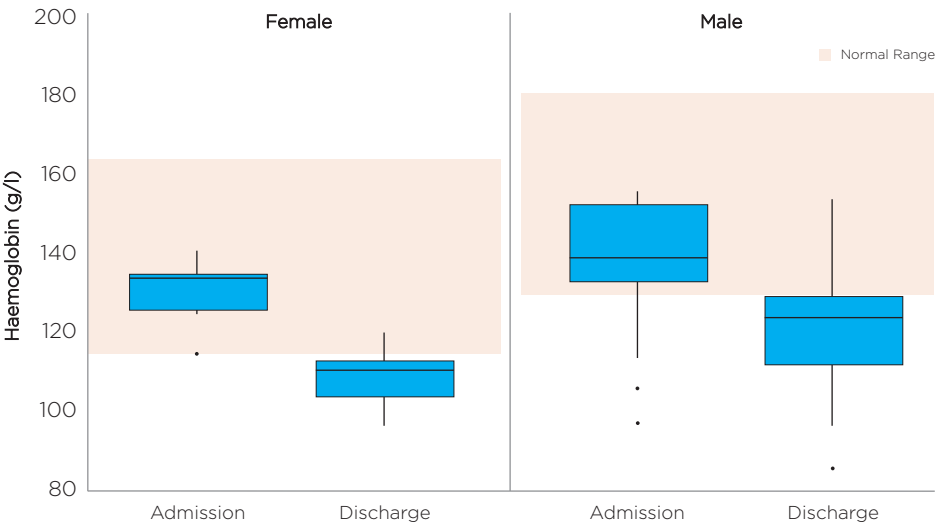


Figure 3: Changes in Hb Levels of Patients between Admission & Discharge



Appetite post discharge was measured on a scale of 1-10, where 1 was very small and 10 was a return of their normal appetite. Twenty-four (71%) reported a good appetite (scoring 8-10) within the first week post discharge.

No patients had any difficulties in accessing food post discharge. All received help from family, friends or neighbours.

Some patients recognised that their diet pre-COVID-19 was unhealthy, consisting of fast food and high calorie snacks, with little fruit and vegetables and felt motivated to consume a healthier diet. Some patients acknowledged that they had not taken their diagnosis of type 2 diabetes seriously but were now keen to take it on board.

The number of contacts per patient, post discharge was recorded. At the time of writing, 25 patients (74%) had been discharged after 2 reviews, with the remaining 9 patients needing regular, (between 3-5) reviews. Early indications suggest that patients who required the most support were those who were older with polymorbidity.

How findings differed from what was expected

It was expected that the patient cohort would present with aspects of malnutrition, because of the effect of the virus on the body, the impact of medical interventions such as ventilation, and the amount of time spent in ICU beds. It was surmised that this would be further compounded by a higher population of elderly and critically ill patients, whose nutritional status may have been compromised before COVID-19. It was anticipated that patients would suffer muscle loss, and this was indeed reported by all the patients reviewed. It was assumed that the type of nutrition support required would entail advice on fortifying foods, to increase the protein and energy density of the diet, and that a persistent poor appetite and early satiety would play a part in delaying recovery.

Upon questioning, many patients reported a good appetite pre-COVID-19 and had been eating normally until a few days before admission. Most patients (71%) saw a return of their appetite within the first week post discharge, describing their appetite in terms of 'being hungrier than ever', or 'feeling hungry all the time'. This return of appetite resulted in these patients reporting weight increases early in the recovery phase. It was anticipated that as a result of intubation, many patients would suffer from swallow issues for some time post discharge,[1] however only 2 patients (6%) needed modified textures on discharge and within a month, all patients had returned to normal fluids and food textures.

Although it was expected that many patients would have loss of taste, only six patients reported this post COVID-19. However, it did not impact their appetite.

What advice was given

All patients were given individualised, tailored advice. For those who were obese and saw a return of their appetite, the priority was to improve muscle mass without too much overall weight gain. They were advised to have a healthy balanced diet with three meals a day, with a good source of protein at every meal, and healthy snacks such as unsalted nuts and milky drinks. Milk powder could be added to food and drink to increase the protein content, but there was no need to fortify their diet to make it more energy dense. Those who were overweight and wished to lose weight, were advised against restricted intake during the recovery phase, as this could hinder muscle rehabilitation, however, the aim was not to return to their original weight. They were reassured that weight loss, after full recovery, would be beneficial.

The Malnutrition Pathway COVID-19 leaflets (Green, Yellow and Red)[4] were a useful resource and the appropriate leaflet was provided to patients by email or post.

Patients who were recovering at a slower rate (26%), received frequent follow ups and liaisons with GPs and SLTs were instigated as necessary.

Patients with low Hb levels on discharge, were advised on how to include iron rich foods in their diet and GPs were requested to monitor levels.

The NHS advise that everyone should consider taking a supplement of vitamin D during lockdown, as a result of being inside more. Therefore, patients were advised to include vitamin D rich foods in their diet and a supplement of 10 micrograms of vitamin D a day was suggested to keep bones and muscles healthy.[5]

Patients were advised that appropriate exercise in conjunction with a healthy diet was necessary for muscle rehabilitation, and confirmation was obtained from the patients that physical activity was part of their recovery programme.

Potential improvements

Evaluating both the extent of muscle loss and muscle mass rehabilitation is not easy. Further investigation into what methods could be used remotely would be useful, with consideration given to the possibility of collaboration between dietitians and physiotherapists.

Obesity is a predictor of poorer outcomes for COVID-19.[2] Obesity influences the immune system, causing chronic low-grade systemic inflammation. The innate immune response in patients with obesity is altered and leads to an increased inflammatory response and abnormal T-cell response.[6] Further studies are necessary to confirm the role of chronic inflammation due to obesity in the pathogenesis of COVID-19. Considering this, every opportunity to promote healthy eating messages during interaction with patients, as well as to the general public, should be taken. Type 2 diabetes is a known risk factor for COVID-19. Renewed efforts to encourage people with diabetes to engage with healthcare professionals are crucial.

In summary

It was reassuring to discover that many patients recovering from COVID-19 didn't need extensive support at follow up. Without conducting this work, the extent and speed of their recovery would have remained unknown. Some patients commented that they were really pleased to receive support, as it made them feel cared for and that it was helpful to know that they were doing the right things to improve their health.

Older patients with polymorbidity needed and received extra support in the form of more follow-ups. Further analysis of the data (the collection of which is still on-going) will strengthen the knowledge underpinning future plans for how to proceed with COVID-19 patients.

This work revealed that having a near death experience motivated some people to strive to lead a healthier lifestyle. This highlights the overarching importance of promoting healthy eating messages at every opportunity, on an individual patient basis and at a national level, and dietitians can play a major part in this.

References: **1.** Barazzoni R, et al. (2020). ESPEN expert statements and practical guidance for nutritional management of individuals with SARS-CoV-2 infection. Clin Nutr.; 39(6): 1631-1638. **2.** Public Health England (2020). COVID-19: review of disparities in risks and outcomes. Accessed online: www.gov.uk/government/publications/covid-19-review-of-disparities-in-risks-and-outcomes (Aug 2020). **3.** Wintermann GB, et al. (2018). Self-reported fatigue following intensive care of chronically critically ill patients: a prospective cohort study. J Intensive Care.; 6:27. **4.** Malnutrition Pathway (2020). COVID-19 Leaflets. Accessed online: www.bda.uk.com/resource/malnutrition-pathway-COVID-19-leaflets.html (Jun 2020). **5.** NHS (2017). Vitamin D - Vitamins and minerals. Accessed online: www.nhs.uk/conditions/vitamins-and-minerals/vitamin-d/ (Jun 2020). **6.** Chiappetta S, et al. (2020). COVID-19 and the role of chronic inflammation in patients with obesity. Int J Obes (Lond).; 44(8): 1790-1792.