COVID-19 Inpatients

The road to recovery

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A recent report on 'After-Care Needs for Inpatients Recovering from COVID-19', published by NHS England,[1] recognises the important role that dietitians play in ensuring adequate nutrition and hydration and preventing malnutrition in COVID-19 patients post-hospital discharge. More than 95,000 COVID-19 patients have been cared for in hospitals across England alone,[1] and whilst the majority of patients have recovered and been discharged from hospital, the effects of the virus itself, as well as invasive treatment regimens are likely to have a long-term impact on these patients.

At the time of writing, the number of active COVID-19 cases in the United Kingdom is continuing to decline, and the focus has turned towards the long-term recovery of discharged COVID-19 inpatients. Nutrition is a vital part of the recovery process for all patients with COVID-19, particularly those who have experienced cardiac or pulmonary complications, as well as those who have developed frailty, sarcopenia or significant weight loss.[2] These patients require individually tailored dietetic support as early as possible in their journey to recovery.

Impact on nutritional status

COVID-19 may cause symptoms such as a fever, coughing, general weakness, pain, difficulty breathing and changes to taste and smell (anosmia). Additionally, anorexia may be observed in COVID-19 patients; this is thought to be due to the effects of anosmia and loss of taste on appetite, as well as elevated levels of pro-inflammatory cytokines.[3] These symptoms can have both short- and long-term effects on nutritional status, some of which we will explore later in this article.

Weight loss & sarcopenia

Sarcopenia describes low muscle strength, low muscle quality or quantity, and low physical performance, and it is commonly observed in the critically ill.[4] COVID-19 patients treated in the intensive care unit (ICU) have been shown to experience loss of muscle mass and function, as well as significant weight loss.[5] This is thought to be due to a significant catabolic response coupled with bed rest and mechanical ventilation.[6] Patients discharged from hospital who have not required ICU treatment also demonstrate weight loss and sarcopenia.[7]

Older people and those with pre-existing health conditions are thought to be at greater risk of severe illness from coronavirus.[8] Due to government shielding recommendations, some patients may have been less physically active for a number of weeks or months prior to a diagnosis of COVID-19. A reduction in physical function is a key risk factor for accelerating the loss of muscle strength and function (sarcopenia).[9] This, combined with malnutrition, increases the risk of frailty.

The term 'frailty' is used to describe a range of conditions and symptoms, such as general debility, sarcopenia, weight loss, increased vulnerability and cognitive impairment. Frail people are at higher risk of adverse outcomes, such as falls, delirium, readmission to hospital, or the need for long-term care.[10]

Patients recovering from COVID-19 may also experience lung damage[11] and may continue to experience feelings of fatigue, shortness of breath, and reduced exercise tolerance in their recovery period.[12] These symptoms may affect appetite and reduce oral food intake,[13] which could further exacerbate malnutrition, frailty and/or sarcopenia.

Dysphagia

Dysphagia, or difficulty swallowing, can be a consequence of mechanical ventilation. A prospective clinical audit of 446 COVID-19 ICU patients[14] indicated that 29% had prolonged post-extubation swallowing dysfunction at discharge with some residual swallowing disorders for up to four months.[15] Complications of dysphagia include malnutrition and dehydration.[16] Patients with dysphagia should be offered foods and drinks that are a safe and appropriate texture for their current level of dysphagia. This should be assessed and regularly monitored by a registered speech and language therapist alongside dietetic input if indicated.

Psychosocial impact

Patients recovering from severe COVID-19 disease may develop psychological difficulties as a result of their experiences of illness and treatment. Research shows that patients admitted to critical care with acute respiratory distress syndrome (ARDS) experience ongoing anxiety (40%), depression (30%) and post-traumatic stress disorder (PTSD) (20%) post-discharge.[17] Some may also present with varying degrees of communication and/or cognitive impairment, which can significantly reduce a patient's capacity for self-care. All of these factors can compromise nutritional intake during recovery.

Long-term consequences

Comparative data[2] from one-year outcomes in survivors of ARDS has shown that recovering patients had persistent functional disability and significant muscle wasting and weakness (sarcopenia) up to a year post-discharge. On an individual level, sarcopenia is associated with:

- Functional decline and cognitive impairment in older adults[18, 19]
- Increased risk of falls and fractures[20]
- Impaired ability to perform usual daily activities[21]
- Cardiac disease[22]
- Respiratory disease[23]
- Reduced quality of life[24]
- All-cause mortality.[25]

On a wider level, untreated sarcopenia has been associated with increased hospital readmissions and healthcare costs.[26]

The importance of nutrition in the COVID-19 discharge pathway

The European Society for Parenteral and Enteral Nutrition (ESPEN) expert statements and practical guidance for nutritional management of individuals with SARS-CoV-2 infection[15] recommends that prevention, diagnosis and treatment of malnutrition should be routinely included in the management of COVID-19 patients post-discharge.

In May 2020, the British Dietetic Association, (BDA) published the 'Nutrition and the COVID-19 Discharge Pathway'[27] (see **Figure 1**), emphasising the importance of screening for malnutrition in recovered COVID-19 patients, regardless of body mass index (BMI). Over 70% of patients with COVID-19 have a BMI which classifies them as overweight or obese.

Figure 1: BDA Nutrition and the COVID-19 Discharge Pathway[27]

1. Every COVID-19 inpatient, regardless of body mass index (BMI), should undergo nutritional screening taking into account weight loss, with particular attention to signs of muscle wasting. This should be recorded on discharge documentation, and a clear plan put in place to provide nutrition support where needed. It is essential that patients with overweight or obesity are screened for malnutrition. Unintentional weight loss and muscle wastage in all patients can lead to malnutrition. Dietetic teams should ensure clear communication between acute and community services as part of discharge processes, to include the nutritional needs and consideration of how nutritional care plans will work within the community setting.
2. Dietitians must be familiar with their local COVID-19 therapy pathways and have discussions with therapy leads and healthcare professionals involved to ensure nutrition and dietetics is embedded as part of a robust multidisciplinary team (MDT) pathway for rehab. Similarly, those leading therapy pathways should contact local dietetic services to ensure nutrition is embedded within them. Health services must ensure sufficient and if necessary additional resources and funding are directed to dietetic services in outreach care as well as services in the community.
3. Health services in the community must seek out and engage with their local dietetic services where required, ensuring those in their care have access to necessary dietary expertise.
4. The BDA, ESPEN and others have produced clinical guidance which should form the basis of all healthcare services rehab pathways, ensuring nutrition is considered at each stage of the patient's recovery journey.
5. Community dietetic teams must be provided with appropriate PPE to undertake their work. Trusts and health boards should utilise digital technology to provide relevant nutritional information and support to patients in light of infection control risk.
6. Support for community nutritional rehabilitation needs to be in place for the long term, in particular as there is likely to be much greater demand from non-COVID patients in the near future due to the impact of shielding and reduced uptake of existing NHS services. Government must provide the resources necessary to achieve this.
7. All dietetic departments should collect consistent data on COVID-19 nutrition outcomes.

Source: BDA Education, Professional Development and Policy Team (2020). Nutrition and the COVID-19 discharge pathway: www.bda.uk.com/resource/nutrition-and-the-covid-19-discharge-pathway.html.

During admission with COVID-19, these patients may experience significant muscle loss, indicating sarcopenic obesity.[1] Patients with a higher BMI should be screened for malnutrition and, where indicated, offered nutrition support advice to replenish and prevent further muscle mass loss.[28]

Nutritional recommendations

Nutrition goals for discharged COVID-19 patients are to prevent or treat malnutrition and to replenish and prevent further muscle mass loss whilst optimising nutrition status.[15] Dietetic support is vital for these patients, to ensure adequate consumption of energy, protein and micronutrients.[28] In patients with a higher BMI, restriction of energy intake with the aim of reducing body weight is not appropriate during recovery due to the risk of reducing lean body mass, strength and function.

Nutrition support for these patients should focus on providing sufficient protein and energy to replenish and prevent further muscle mass loss. This is particularly important in patients aged >65 years.[27] Strategies to help patients meet their energy and protein requirements include dietary counselling (i.e. food-first advice), dietary modification (i.e. texture-modified diets for those with dysphagia), and the prescribing of oral nutritional supplements (ONS) when indicated.[28] Individual care should be adjusted to address complications, such as dysphagia, shortness of breath, fatigue, dry mouth, and taste and smell changes.[31]

Energy & protein

Achieving a sufficient energy intake to maintain a healthy BMI is important for the prevention of malnutrition; a contributing factor in the pathogenesis of sarcopenia.[29] Similarly, ensuring an adequate intake of protein is important for preventing and treating sarcopenia. When calculating energy and protein requirements for patients requiring nutritional support, ESPEN and the National Institute of Clinical Excellence (NICE)[30] recommend targets of 25-35 kcal/kg/day with a protein intake of 1.0-1.5 g/kg body weight/day. Additionally, patients should maintain adequate intakes of fluids (30-35 ml fluid/kg), electrolytes, minerals, micronutrients (taking into consideration any pre-existing deficiencies, excessive losses or increased demands) and fibre, if appropriate.[15]

Oral nutrition supplements

The use of high-energy, high-protein oral nutritional supplements (ONS) may be indicated in patients who are unable to meet their nutritional requirements through an oral diet alone. ONS products are used for medical purposes in patients who meet the Advisory Committee on Borderline Substances (ACBS) prescribing criteria, have been screened using a validated malnutrition screening tool, such as the 'Malnutrition Universal Screening Tool' ('MUST'),[31] and have been deemed to be at nutritional risk. ONS should always be given under medical supervision and must be used appropriately.

The 2020 ESPEN consensus paper on nutritional management of COVID-19 patients recommends that: *"ONS should be used whenever possible to meet a patient's needs, when dietary counselling and food fortification are not sufficient to increase dietary intake and reach nutritional goals."*[15]

ONS should supply, according to ESPEN, at least 400 kcal/day, including 30 g or more of protein/day for at least one month. The efficacy and expected benefit of ONS should be assessed monthly. Rehabilitation for COVID-19 patients can take up to a year. Therefore, ESPEN recommends that ONS prescriptions should continue during this period until it's no longer indicated.[15]

Conclusion

The effects of the virus itself, as well as invasive treatment regimens are likely to have a long-term impact on the nutritional status of COVID-19 patients post-hospital discharge. Dietitians play an important role in optimising the nutritional status of COVID-19 patients post-discharge, which is widely recognised in the recently published NHS England report *'After-Care Needs for Inpatients Recovering from COVID-19'*.[1] Nutrition support in the community, with a focus on meeting protein and energy requirements, is recommended for up to one year following discharge.

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