The Use of Nutritional Support in the Treatment of Gastrointestinal Conditions



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Gastrointestinal conditions can have multiple and severe consequences on nutritional status. Frequently, conditions such as inflammatory bowel disease and coeliac disease may take time to be diagnosed, pre-disposing those treated for the condition with increased risk of malnutrition and micronutrient deficiency at the point of diagnosis.

Malabsorption, dietary treatments and intake, medication and surgery, coupled with an, often, increased demand for nutrients, can exacerbate the prevalence of weight loss and suboptimal micronutrient levels.

These factors will be explored through this article, particularly focusing on inflammatory bowel disease (IBD), coeliac disease and liver disease.

Medical and dietary treatment may vary internationally for gastrointestinal conditions. However, at the time of publication, the universal impact of the COVID-19 pandemic has not yet abated and thus, whilst global research is reviewed, the current UK perspective on managing these conditions is primarily considered.

Inflammatory bowel disease

Inflammatory bowel disease can impact nutritional status in several ways – nausea, lack of appetite, as well as self-imposed dietary restrictions, can inhibit dietary intake. Combining this with malabsorption of nutrients, further increases the risk of inadequate nutritional intake. When malabsorption occurs, there is an increase in the requirement for all nutrients, including energy, protein and micronutrients.

There has been much speculation in the literature around vitamin D and inflammatory bowel disease (IBD),

with data in both Crohn's disease and ulcerative colitis showing that lower levels of vitamin D have been linked to increased moderate to severe disease activity – for example, 'flares' of worsening symptoms – and possibly of increased or earlier risk of occurrence.^{1, 2} There may also be a reduced bioavailability of vitamin D in IBD, and a supplemental dose of 2000 IU/day has been demonstrated in several studies to maintain stable serum levels.¹ Currently, there is not a formal recommendation for vitamin D supplement dosage for IBD patients.

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Corticosteroids are frequently used in the treatment of IBD, particularly for adult patients. This is because these conditions arise as immune system responses, and when a 'flare' or increased inflammation period occurs, corticosteroids are usually prescribed to dampen the immune response and prevent a deterioration in symptoms.

Steroids can impact nutritional health in a number of ways, such as increasing appetite and subsequent weight gain, steroid-induced diabetes, cause or increase blood glucose levels in those with existing diabetes.3 There may also be an impact on nutritional bone health, resulting in an increased risk of osteopenia and osteoporosis. 800-1000 mg calcium and 800 iu vitamin D is recommended as a preventative co-prescription when steroids are prescribed, unless calcium intake from diet meets that level, and then vitamin D alone should be prescribed.³ Ongoing re-evaluation of osteoporosis risk is recommended for those prescribed steroids. Steroid use is just one factor when considering the long-term bone health for those with IBD. Inflammation and reduced intake of key nutrients for bone health also exacerbate the risk of osteopenia and osteoporosis in the long-term and should be evaluated. The dietary intake of calcium, vitamin D and vitamin K has been shown to be lower in those with IBD compared to controls, warranting further attention as to what additional supplementation may be needed in bone health, since these are potentially reversible risk factors for osteoporosis if treated.4

As steroidal use may reduce immune response, through the height of the COVID-19 pandemic, those taking steroids (orally or intravenously with a dose greater than or equal to 20 mg prednisolone or equivalent per day), or over 70 years of age with a further health condition that may pre-dispose them to the COVID-19 virus, such as type 2 diabetes in addition to IBD, were advised to 'shield'.⁵ Whilst those shielding have had access to priority supermarket shopping, this has been variable, and for those who were unable to access this service due to the financial thresholds for online ordering or other reasons, food poverty has been further aggravated by the impact of the virus.6 Obvious lack of exposure to sunlight for those shielding through the height of the pandemic may have further increased the risk of vitamin D deficiency. A rigorous assessment of the barriers to optimal nutrient intake is indicated to implement strategies, which may include the use of vitamin and mineral supplementation tailored to a patient's intake and clinical risk factors.

Anaemia has been cited as the most prevalent extraintestinal complication of IBD, with iron deficiency anaemia being the most common.⁷ Iron supplementation may be tolerated orally, but due to the gastrointestinal side effects, particularly with high iron doses, intravenous iron therapy may be indicated.⁷

When assessing nutritional status during a 'flare' of IBD, caution must be taken when looking at biochemistry within an assessment, since this can be severely impacted when inflammatory markers are raised. C-reactive protein (CRP) is commonly measured to review inflammatory response and as a marker of the person's reaction to the treatment for their 'flare'. For selenium and vitamins A and C there is a large shift in laboratory figures, with an average 40% reduction in median figures when CRP is elevated.8 For copper, instead of a reduction in the figure, there is an increase in concentration when CRP is raised.8 Therefore, when CRP is greater than 10 mg/L, plasma copper, selenium and vitamin C are unreliable.8 When CRP is greater than 20 mg/L, additionally plasma zinc, vitamin A and vitamin D become unreliable.⁸ The systemic inflammation measured by CRP may be due to other causes aside of a 'flare' of inflammatory bowel disease, e.g. due to infection, surgery or other trauma,8 and therefore the distortion of laboratory values needs to be considered in conjunction with the CRP level when any systemic inflammation occurs.

In the short-term, during a flare, oral nutritional supplements (i.e. sip feeds), enteral or parenteral nutrition supplementation may be required to meet nutritional needs. If energy and macronutrient needs can be met orally through food, attention may also need to be placed on micronutrient intake where a person may be self-restricting fibre intakes (e.g. fruit, vegetables, nuts) and whether a vitamin and mineral supplementation is required. "When assessing nutritional status during a 'flare' of IBD, caution must be taken when looking at biochemistry within an assessment, since this can be severely impacted when inflammatory markers are raised."

Coeliac disease

Coeliac disease affects approximately one in one hundred adults in the UK, with many being undiagnosed.9 There are multiple symptoms that would raise red flags including, but not limited to, unexplained, persistent, abdominal or gastrointestinal symptoms, unexplained weight loss (although normal weight and obesity can co-exist with coeliac disease), prolonged fatigue, and unexplained iron deficiency anaemia, or reduced vitamin B12 and folate levels.¹⁰ During the COVID-19 pandemic, where endoscopy services may be limited, the British Society of Gastroenterologists (BSG) have issued interim guidance suggesting that biopsy diagnosis is not indicated to be able to diagnose coeliac disease and to treat presumptively with a gluten-free diet." BSG cite that an IgA tissue transglutaminase (tTG) level of ≥10x the upper limit of normal (ULN) is more than 90% predictive of villous atrophy in the adult population." This may result in more people being diagnosed and treated more quickly.

Annual monitoring of iron status, vitamin B12, folate, calcium and vitamin D are recommended in the NICE guidance for those diagnosed with coeliac disease.¹⁰ An audit of gastroenterology clinics within a district general hospital clinic setting indicated that 25% of patients did not have a full blood count, folate and vitamin B12 levels monitored at their annual review and 33% did not have calcium and vitamin D monitored.¹²

This is of concern, especially as there are increased calcium requirements for adults with coeliac disease (300 mg greater than the general population, aiming for a target intake of 1000 mg) and increased risk of osteoporosis.¹⁰ Further risk assessment for osteoporosis, including measurement of bone density, may be indicated through a DEXA (dualenergy x-ray absorptiometry) scan.¹²

Since 2015, local NHS Clinical Commissioning Groups (CCGs) have been choosing to restrict or cease prescriptions of gluten-free food products to save money within the local NHS economy. People with coeliac disease have raised this as a cause of concern for their quality of life and the impact of an increased dietary burden.¹³

Often, prescribed gluten-free food products (product dependent) are fortified with iron and other micronutrients, such as folic acid. If access to these prescribed foods is stopped or restricted, those living with condition voice concerns of the higher costs of gluten-free food products (compared to their gluten-containing counterparts) in the supermarket and the potential difficulty in accessing them.13 As a result, this may limit the intake of micronutrients from these sources. Naturally gluten-free foods (e.g. rice) may match energy and carbohydrate needs but would contain less micronutrients than gluten-free bread, for example.

Additional supplementation of nutrients – such as iron, folic acid, vitamin B12 and calcium – may be required if dietary intake cannot be increased to meet a higher physiological demand. The need for regular biochemical monitoring, in conjunction with dietary assessment, is required to assess individual needs.

Liver disease

There are many causes of liver disease, such as high, regular, alcohol intake, obesity, and viral infection. Although, in the UK, alcohol is still the biggest cause of liver disease accounting for approximately 60% of cases.¹⁴

When liver disease is decompensated, there is an increase in energy and protein needs that may not be met through oral diet alone, requiring oral or enteral nutrition support.

Steroids may also be prescribed as a treatment, and similar considerations to those highlighted earlier in the IBD section, such as bone health, need to be factored into a patient's nutritional care.

Where alcohol is the cause, and if alcohol use is ongoing, this can cause multiple nutritional problems, due to factors such as associated poor diet and gastrointestinal dysfunction. High doses of thiamine are indicated for patients at high risk of developing, or with suspected, Wernicke's encephalopathy, an acute neurological condition resulting from severe thiamine deficiency. Parenteral or oral thiamine is also indicated for harmful and dependent drinkers who are at risk of malnutrition or have decompensated liver disease.¹⁵

Since fat soluble vitamins, iron and copper are stored in the liver and bile production may also be impaired by liver damage, there is an increased risk of deficiencies. Fat soluble vitamin to supplementation mav need he considered. The British Society of Gastroenterology recommends there should be a low threshold for replacement of fat-soluble vitamins with a multivitamin in the management of primary sclerosing cholangitis.16

Gastrointestinal surgery

Nutritional considerations associated with gastrointestinal surgery for gastric, oesophageal and pancreatic cancers has been explored in an earlier article in this series, highlighting the need for monitoring and supplementation of key nutrients such as iron, vitamin B12 and fat-soluble vitamins.¹⁷ Surgery on the gastrointestinal tract for other indications or complications - for example, fistulae, ischaemia leading to short bowel syndrome and gastric bypass surgery as a bariatric surgery for the treatment of weight management and/or type 2 diabetes - will be discussed further in a future edition of CN.

Conclusion

Inflammatory bowel disease, coeliac disease and liver disease are common gastrointestinal conditions, which can impair micronutrient absorption or storage and create a higher nutritional demand, due to the pathology of the condition or its treatment (e.g. steroids). This may increase the risk of deficiencies and ongoing monitoring through dietary analysis and biochemical parameters, when valid, are needed. This will prevent long-term complications, which may arise if not treated, such as iron deficiency anaemia and osteopenia or osteoporosis.

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