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The Changing Landscape of Bowel Cancer in the UK

Colorectal cancer is the 4th most common form of cancer in the UK, and its incidence rates have been increasing in recent years. According to Cancer Research UK, there were 42,000 new cases of bowel cancer diagnosed in the UK in 2018, which equates to around 115 new cases every day.[1] 44% of cases in the UK are in females, and 56% are in males, and it remains a significant challenge to detect this in its earlier stages. It is therefore important to keep abreast with new nutritional approaches and practice for prevention and disease management to help improve patient care. Therefore, within this article, we aim to discuss the changing trends in the disease demographics, screening, and discuss some of the recent research relating to dietary advice and interventions.

Screening & symptoms

Around half of all colorectal cancer cases are diagnosed at an early stage (stage 1 or 2), when the cancer is localised to the bowel and has not spread to other parts of the body. The remaining half of cases are diagnosed at a later stage (stage 3 or 4), when the cancer has spread to nearby lymph nodes or to other organs (metastasis). In the UK, screening eligibility changed in April 2021, appreciating the need to lower the age threshold from 60 down to 50 years of age. Individuals are invited to complete a home-based stool test every two years. This test is called the faecal immunochemical test (FIT) and it looks for traces of blood in the stool, which can be a sign of bowel cancer.

Symptoms of concern can include changes in bowel habits (such as persistent diarrhoea or constipation), blood in the stool, abdominal pain or discomfort, unexplained weight loss, and fatigue. However, many of these symptoms can be perceived as generic and patients often can attribute these to other ailments or busy lifestyles. For example, in the UK, only around 58% of people invited to take part in the Bowel Cancer Screening Programme complete the test, whereby a key limitation is often cited as social anxiety, stigma and embarrassment.[2]

Dietary factors

With the above in mind, more recent research indicates that in the UK there has been a gradual increase in the incidence of bowel cancer among people under the age of 50 over the past few decades. This has also been observed in the USA and across Europe. This statistical trend makes it ever more important for early diagnosis and thus earlier treatment to reduce the risk of recurrence and improve survival outcomes. Equally, better than early diagnosis would be that of disease prevention and a better understanding as to what modifiable risk factors can be conveyed to the public to improve this. Dietary factors have a significant impact on the development and progression of bowel cancer, and we shall therefore discuss some of the more recent trends impacting this.

We have long known that increased red and processed meat consumption are associated with increased risk of colon and rectal cancers. Mechanistically, we have come to understand the multiple oncogenic effects these foods have, additionally influenced by the processing, storage and cooking techniques used. For example, the smoking and curing of meats creates carcinogenic compounds – e.g. N-nitroso compounds (NOC) and polycyclic aromatic hydrocarbons (PAHs) – and cooking at high temperatures produces heterocyclic aromatic amines (HAAs).[3] These compounds have been shown to influence various cellular processes, increasing cell proliferation, migration and invasion, whilst interfering with apoptosis and DNA damage; all processes which can link to the promotion of carcinogenesis. Whilst we focus on cancer risk, it is also well established that reduction of red and processed meat consumption also benefits and reduces the disease risk and burden from conditions such as diabetes and cardiovascular diseases.

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Based on what we know, it is important to look at how this translates in practical terms. With the latest research suggesting that each 100 g per day of combined red and processed meat intake is associated with an 18% increase in risk of colorectal cancers, this helps to guide national dietary guidelines. For context, the current UK dietary recommendations advise 70 g or less (red and processed meats combined) which equates to ~500 g per week. The latest National Diet and Nutrition Survey (NDNS) data (2020) suggests that adults are, on average, within this limit, stated as around 72 g per day for men and 52 g per day for women.[4] However, noting this should be interpreted as an average and some individuals will eat significantly more and some less.

At the time of writing, it is also important to think of the economic predicament of the UK and the impacts on income and subsequent health disparities. Such factors can continue to influence the above statistics – e.g. the observed rise in the consumption of processed meats; traditionally associated with lower income groups and made exponentially worse during times of economic crisis. At present, across the UK, more of the population are transitioning into this group whereby affordable access to nutritious food has become more challenging and food poverty is becoming a serious health concern, influencing this disease risk. This could in turn play a significant role in the changing demographics seen in colorectal cancer and other non-communicable diseases.

Another key dietary factor is the role of fibre intake, whereby national surveys, combined with epidemiological data, suggest 28% of bowel cancers are caused by lack of fibre intake. Furthermore, a recent meta-analysis of prospective studies confers a linear relation that by every 10 g/d increase in total dietary fibre from cereals and wholegrains, this decreased the risk of colorectal cancers by 9%.[5] Current intakes in the UK fall well short of current recommendations (30 g dietary fibre/day), with the latest NDNS data (2020) showing 17.2 g for men and 16.3 g for women.[4]

Various mechanisms are believed to contribute to the reduction in cancer risk from fibre and it is important to note that not all fibre types are equal on this matter. The above studies specifically note beneficial effects of cereal/wholegrain fibres (sometimes known as insoluble fibres), likely due to the differing chemical composition and physicochemical properties. Initially, much emphasis was placed on decreasing transit time and stool bulking reducing and diluting carcinogenic contact time with the colonic lumen. However, more recent research, and an area of growing interest, is the role of fibre and its impact on the gut microbiota. It is noted that increased fibre intake is associated with increased microbiota diversity and increased production of short chained fatty acids during bacterial fermentation, which demonstrate anticarcinogenic properties.[6]

More recently, interventions have explored direct dietary interventions which influence the microbiota in the form of pro/prebiotic intake. It is hypothesised that specific probiotic strains could help in the prevention and treatment of bowel cancer via various mechanisms influencing the evolution of tumours. Research to date has demonstrated that probiotic strains, such as *Lactobacillus plantarum*, *Lactobacillus acidophilus*, and *Bifidobacterium longum*, aid mucosal barrier function and reduce tumour proliferation.[7] Prebiotic inulin has also received much attention for its potential role of controlling tumour cells' proliferation and apoptosis. There have also been studies assessing this as a potential beneficial modifier reducing gastrointestinal side effects to chemo and radiotherapy. This gives promise to further research looking to explore the gut microbiome and its manipulation via dietary changes or supplementation to counter carcinogenic impacts.

Other factors

Other significant factors to note, but have not been explored in this article, include the ongoing role of obesity/increased weight and the role of alcohol consumption; both established risk factors for bowel cancer amongst other diseases. Interestingly, albeit obesity remains a significant challenge with rising rates across the UK, it is noted that alcohol consumption across the population, and particularly amongst younger generations, is declining.

In summary

These combined modifiable risk factors discussed in this article will continue to contribute to disease burden and will have an impact in shaping the changing landscape of disease prevention and treatment when it comes to cancer care. Dietary changes and intervention remain a key factor in managing disease risk and treatment and play an important role in empowering individuals when facing such challenges.

Key points:
- Recognise the changing demographics at presentation, appreciating that a younger cohort is becoming increasingly at risk of bowel cancer, adjusting screening/management accordingly
- Importance of screening and improving uptake of the national screening programme
- Address dietary trends which suggest an increasing consumption of processed meats; a significant risk factor for bowel cancer and consider alternative protein sources
- Advocate and advise on increasing dietary fibre intake to the recommended levels 30 g/d (preferably from cereals and wholegrains)
- Keep abreast of evolving research which seeks to utilise pre/probiotics to favourably influence the gut microbiota and subsequently influence bowel cancer risk/management
- Continue to advocate and help address issues around weight management (and minimise sarcopenic changes) and alcohol consumption; two significant factors to bowel cancer risk and recurrence.

References: 1. Cancer Research UK. Bowel cancer risk. Accessed online: www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bowel-cancer/risk-factors (Apr 2023). **2.** Shaukat A, Levin TR. (2022). Current and future colorectal cancer screening strategies. Nat Rev Gastroenterol Hepatol.; 19(8):521–531. **3.** Farvid MS, *et al.* (2021). Consumption of red meat and processed meat and cancer incidence: a systematic review and meta-analysis of prospective studies. Eur J Epidemiol.; 36: 937–951. **4.** GOV. UK (2020). NDNS: results from years 9 to 11 (2016 to 2017 and 2018 to 2019). Accessed online: www.gov.uk/government/statistics/ndns-results-from-years-9-to-11-2016-to-2017-and-2018-to-2019 (Apr 2023). **5.** Oh H, *et al.* (2019). Different dietary fibre sources and risks of colorectal cancer and adenoma: a dose–response meta-analysis of prospective studies. Br J Nutr.; 122(6): 605–615. **6.** Cheng Y, Ling Z, Li L. (2020). The Intestinal Microbiota and Colorectal Cancer. Front Immunol.; 11: 3100. **7.** Flemer B, *et al.* (2017). Tumour-associated and non-tumour-associated microbiota in colorectal cancer. Gut.; 66(4): 633–643.

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