3. Metabolic Syndrome and Inflammatory Bowel Disease

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A progressive rise in the incidence and prevalence of inflammatory bowel disease (IBD) is discernible in most Asian Pacific countries; the increase is more so for ulcerative colitis (UC) than Crohn’s disease (CD). Some ethnic differences are notably evident, as Japanese suffer more IBD than Chinese or Malays. The influence of environmental factors is also demonstrated by changes in the incidence and prevalence of IBD when populations move from one area to another. For example, Japanese immigrants to Vancouver have an increased prevalence of disease in the first generation born in North America. Thus, the accumulative numbers of registered patients of IBD has risen to three times that in the early 90’s, and the total number is thought to be more than 100,000. The age of onset and gender are similar to those of Western patients, as are the distribution and extent of disease which, however, tends to be clinically less severe than in European and North American patients. A family history is occasionally elicited. Smoking appears to have the same impact on IBD as seen in the West. A remarkable difference is the absence of any association of Asian CD with NOD2/CARD15 mutations (1), as repeatedly observed in Caucasian and Jewish populations. While previously noted racial and ethnic differences seem to be narrowing.

Differences in incidence across age, time, and geographic region suggest that environmental factors significantly modify the expression of UC and CD. The strongest environmental factors identified are cigarette smoking (2-4). The relationship between smoking behavior and IBD is complex (Fig. 1). While CD is associated with smoking and smoking has detrimental effects on the clinical course of the disease, UC is largely a disease of nonsmokers and former smokers. Interestingly, cigarette smoking may even result in a beneficial influence on the course of ulcerative colitis. The potential mechanisms involved in this dual relationship include changes in humoral and cellular immunity, cytokine and eicosanoid levels, gut motility, permeability, and blood flow, colonic mucus, and oxygen free radicals. Nicotine is assumed to be the active moiety. The differential therapeutic consequences comprise the cessation of smoking in CD and, so far, clinical trials use nicotine in different forms of application for UC.

Differences in diet might explain the significant differences in IBD risk across geographic regions and the increase in IBD incidence in migrant populations. However, despite numerous studies of dietary factors in IBD (Fig. 1), no consensus has emerged. Studies examining the association between diet and disease are difficult to perform because of poor recall of diet and the possibility that diet was subconsciously altered even before formal diagnosis because of gastrointestinal symptoms. The most consistent association noted in dietary studies has been the link between increased sugar intake and IBD, especially Crohn’s disease. http://www2.gastrojournal.org/scripts/om.dll/serve?action=searchDB&searchDBfor=art&artType=full&id=as0016508504004627-bib129#bib129 Numerous case-control studies have confirmed the association between sugar intake and Crohn’s disease, and these have been reviewed elsewhere (5). Studies that have minimized difficulties with dietary recall by studying patients diagnosed within 1 year have yielded conflicting results, with some studies showing an association http://www2.gastrojournal.org/scripts/om.dll/serve?action=searchDB&searchDBfor=art&artType=full&id=as0016508504004627-bib131#bib131 but others not. http://www2.gastrojournal.org/scripts/om.dll/serve?action=searchDB&searchDBfor=art&artType=full&id=as0016508504004627-bib134#bib134 Numerous case-control studies have confirmed the association between sugar intake and Crohn’s disease, and these have been reviewed elsewhere (5). Studies that have minimized difficulties with dietary recall by studying patients diagnosed within 1 year have yielded conflicting results, with some studies showing an association http://www2.gastrojournal.org/scripts/om.dll/serve?action=searchDB&searchDBfor=art&artType=full&id=as0016508504004627-bib131#bib131 but others not. http://www2.gastrojournal.org/scripts/om.dll/serve?action=searchDB&searchDBfor=art&artType=full&id=as0016508504004627-bib131#bib131

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The human gut is the natural habitat for a large and dynamic bacterial community. There is a substantial body of evidence implicating the resident flora in the pathogenesis of chronic intestinal inflammation. Recently developed molecular biologic tools suggest that a sizeable part of the microbial populations of the human gut remains to be defined. Conversely, the relevance of gut bacteria in the host’s physiology is well documented (Fig. 1). The specialised lymphoid follicles of the gut mucosa are the major sites for induction of effector and regulatory mechanisms of the intestinal immune system, and it is now becoming clear that resident and in-transit microorganisms play an essential role in the homeostasis of local and systemic immunity (7). Although an infectious origin of inflammatory bowel disease is not supported by our current knowledge, some reports have disclosed substantial differences in the intestinal flora between patients with IBD and healthy subjects, in regard to both composition and mucosal colonisation. Aggressive species are abundant on the inflammatory bowel disease mucosal surface whereas protective genera are underrepresented, but the biologic relevance of these changes needs further investigation. Thus, a balanced microbial environment would likely help in both prevention and control of IBD. Research is needed to identify microorganisms able to mediate immunoregulation in the gut mucosa.

Additional epidemiologic studies to define better the burden of illness, explore the mechanism of association with environmental factors, and identify new risk factors are needed to know the precise pathophysiology of IBD as a metabolic syndrome (Fig. 2).

References


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