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Problems in diagnosis of IBD in children

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Abstract

Children and adolescents with inflammatory bowel disease (IBD) present unique challenges to physicians and all health-care providers. The most important aspect is that children are not small adults. They are characterized by a highly dynamic state of growth and physical change as well as a constant alteration in psychological status. It will not be difficult to recognize IBD, even in children, when it presents with classical symptoms such as bloody diarrhoea, abdominal pain and weight loss. However, some children will present with abdominal pain and depression. Not infrequently these children are diagnosed as being depressed and are seen and treated by psychologists and psychiatrists for different periods of time. In addition, several children will be initially diagnosed as having a bacterial gastroenteritis with a proven positive faecal culture. It seems to be the triggering event in these children, and if adequate therapy fails, colonoscopy is indicated. Recently, Beattie et al. showed that in children seen for chronic abdominal pain simple routine blood tests including full blood count and erythrocyte sedimentation rate are almost always abnormal in children with IBD. But most importantly, growth retardation is common in children with IBD and is more often found in Crohn's disease (CD) than in ulcerative colitis (UC). Faltering growth is a sign of a catabolic situation. Therefore, it is essential to follow the growth of children at the beginning and during treatment of IBD. Growth retardation can be the first symptom of IBD and is often already present before other symptoms of IBD become apparent. Rarely, extra-intestinal manifestations, particularly arthritis, can be the first and sometimes only initial symptom for months to years in children with IBD.

About 2% of all patients with IBD present before the age of 10 years, but 30% present between the age of 10 and 19 years. A significant proportion of young patients with IBD will develop the disease just prior to or during puberty. Adolescent growth is characterized by rapid accumulation of lean body mass and any inflammatory disease occurring at this time is likely to have a major impact on nutritional status and growth. This rapid growth requires an appropriate increase in nutritional substrates and failure to achieve catch-up growth may ultimately lead to poor cumulative growth over time. Most of the growth retardation is seen in children with CD, approximately 30%. However, also in UC 15% will show a reduction in growth. The higher percentage in CD could be due to the disease itself or to the relative subtlety of the intestinal manifestations of CD, mainly abdominal pain and general malaise.

Not only growth, but also delayed puberty, is a sign of an ongoing disease that most likely needs more intensive treatment. It has been shown that the severity of disease activity plays a more important role in the occurrence of growth retardation than steroid treatment. Therefore in paediatrics it is important to state that growth retardation during medical treatment equals undertreatment. In contrast to adults, the potential benefit of nutritional therapy should be seriously considered in addition to aggressive medical therapy including steroids and other immunosuppressive agents such as azathioprine. The most convincing evidence that malnutrition is primarily responsible for growth failure is based on depletion studies. The malnutrition itself is caused by ongoing inflammation and loss of appetite. Recommendations for nutritional therapy include an increase in energy and protein intake to 150% of recommended daily allowances for height and age. Some studies have shown the benefit of nocturnal nasogastric infusion as supplements of daily intake. Importantly,

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nutritional support has been shown to be as effective as steroids in achieving remission of disease in children. Furthermore, no significant differences have been shown in studies using elemental versus polymeric diets.

In conclusion, growth can be considered as an important marker of control of disease activity and success of therapy. The major challenge to physicians in the diagnosis and treatment of IBD in children is to recognize growth failure. In addition, pubertal depression in combination with weight loss should raise the suspicion of IBD.

Keywords: Inflammatory bowel disease; Crohn's disease; Ulcerative colitis; Children; Nutrition; Growth retardation

1. Introduction

The difficulties in diagnosing inflammatory bowel disease (IBD) in children are not reflected in the clear manifestation of the disease as known in adults but in the obscure initial symptoms of an ongoing inflammation of the bowel in growing children. In contrast to adults, children often complain of abdominal pain, loss of appetite and, if clearly understood, a change in defaecation pattern. The onset of abdominal pain, loss of appetite and consequently decrease of growth velocity are often difficult to establish. On average, the delay in diagnosis of IBD, particularly small-intestinal Crohn's disease, remains between 1 and 2 years. Very often the initial symptoms are thought to be due to psychological stress, difficulties at school and/or in relationships. Particularly in children during puberty abdominal complaints are often misinterpreted. Occasionally we see children who have been treated by psychiatrists or psychologists for depression for extended periods of time. Particularly in children with abdominal pain and weight loss in the presence of abnormal blood parameters, such as increased sedimentation rate, treatment for depression should be started after the exclusion of Crohn's disease. Recently, Beattie et al. showed that in children seen for chronic abdominal pain, simple routine blood tests including full blood count and erythrocyte sedimentation rate are almost always abnormal in children with IBD [1].

The variation in growth velocity is often considered to be part of ongoing puberty rather than as a symptom of an ongoing disease [2]. Very often no careful data are available regarding height, weight and pubertal status according to the criteria of Tanner in children referred to physicians for chronic abdominal pain. It is therefore of great importance that young children, especially those at the beginning of puberty, who visit physicians for abdominal pain are accurately measured and put in growth curves according to age and sex. Any child with a delay in growth and puberty should be considered a candidate for endoscopy and small-intestinal X-ray examination to exclude the existence of Crohn's disease or ulcerative colitis.

2. Aetiology of growth failure

Growth failure is associated with IBD and has been attributed to nutritional, hormonal and disease-related factors [3–5]. The strongest evidence at present supports the idea that malnutrition is a primary cause of growth retardation in this disorder. Malnutrition in these patients is a multifactorial problem and it is often impossible to identify a single cause in individual cases. The major factors include inadequate dietary intake, excessive of gastrointestinal losses, malabsorption, increased nutritional requirements, the response of the body to inflammatory agents and psychological stress.

3. Dietary intake

Inadequate dietary intake may occur in patients with IBD because of altered taste perception and the anorexia induced by chronic illness. A few studies have quantified actual dietary intake in patients with this disease. In adults approximately 45% of the patients met their recommended dietary allowances for energy, whereas 40% consumed at least 2/3 and 50% consumed less than 2/3 of the allowance [6].

4. Enteric losses and malabsorption

Excessive loss of blood and protein in the stool and increased faecal loss of mucosal cells result from chronic inflammation and ulceration of the intestinal

mucosa. Fat malabsorption is an indirect consequence of bile salt deficiency. Excessive loss of fat in the stools occurs in approximately 30% of children with Crohn's disease. These abnormalities are due to a varying combination of mucosal damage, bacterial overgrowth and intraluminal bile salt deficiency. An increased nutritional requirement may be present in response to fever, inflammatory activity, abscesses, sepsis, intestinal fistulas or increased turnover and repair of intestinal mucosa [7]. The stresses imposed by inflammation may represent important factors associated with the development of chronic malnutrition and growth failure.

5. Psychological factors

Psychological stress may also influence nutritional intake. In addition, the daily presence of abdominal pain may influence the child's behaviour; very often the child is withdrawn and anxious. Growth delay may increase concern about the child's ultimate size. The parental involvement in urging children to eat may set up battles over food and lead to rebellion and further poor intake. A significant risk exists for the development of an eating disorder superimposed on the anorexia related to disease activity [4].

6. Mechanisms of growth retardation in IBD

Malnutrition as well as inflammation are all factors influencing growth in children. Many children with IBD have insufficient caloric intake resulting in growth impairment. In general, malabsorption is considered to be of minor importance in the cause of growth failure. Endocrine function in children with IBD is considered of secondary importance. In children with IBD low levels of IgF-1 have been found. Adequate therapy either with elemental diet or steroids resulted in increasing IgF-1 values. Most importantly inflammation is considered to be the most potent inhibitor of growth. Several studies have shown that growth velocity is the most sensitive method to diagnose impaired growth and to follow the effects on growth during therapy [2]. Therapeutic regimens for IBD in children must focus not only on the response of inflammation but also on growth. The principle is to choose an individual therapy that brings the patient into remission but without negative effects on growth. Aggressive nutritional therapy should be considered for all children with IBD, especially during puberty when the growth curve may give a false impression of normal growth. Therefore nutritional therapy is an important modality in the management of IBD, especially Crohn's disease. Studies have shown that nutritional support can induce remission of Crohn's disease as efficiently as steroids in paediatric patients, especially at the onset of the disease. Furthermore, nutritional therapy is suitable for use in cases of corticosteroid-dependent and -resistant Crohn's disease. Nutritional therapy is an efficient way of treating growth failure. There are however no long-term prospective studies that include ultimate linear growth. The benefit of enteral feeding on the child's quality of life must be compared with the potentially negative effects of steroids and other therapeutic agents in the treatment of growth failure in childhood IBD.

7. Genetic growth potential

Most physicians regularly record the weight of their patients, but very few regularly measure height and pubertal status. Therefore it seems to be important to emphasize the use of normal height and weight measurements and puberty staging in the treatment of children with IBD. The difficulty in diagnosis of IBD in children is reflected in the misinterpretation of a slowing of linear growth or pubertal development. In all patients it is important to estimate the growth potential as characterized by the height of the child's parents. Several risk factors have been identified for growth failure. They include Crohn's disease as compared to ulcerative colitis, males more than females, and those with severe disease activity and malnutrition at onset [3–5,7]. It is therefore important to follow growth in these children on a regular basis.

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