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COMPARISON OF DISABILITY ASSOCIATED WITH PEDIATRIC AND ADULT ONSET INFLAMMATORY BOWEL DISEASE: A REVIEW STUDY

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Abstract:

The inflammatory bowel diseases (IBDs), include ulcerative colitis and Crohn's disease, are chronic inflammatory disorders of the gastrointestinal tract most often diagnosed in adolescence and young adulthood, with a rising incidence in pediatric folks. These diseases are more frequent in children that most pediatricians and other pediatric clinicians will encounter children with IBD in their routine practice. Inflammatory bowel disease is caused by a dysregulated mucosal immune response to the intestinal microflora in genetically predisposed hosts. Although children can present with the classic symptoms of weight loss, abdominal pain, and bloody diarrhea, many present with non-classic symptoms of isolated poor growth, anemia, or other extra intestinal manifestations. When IBD is diagnosed, the goals of treatment protocol consist of eliminating symptoms, maintain normal quality of life, restoring growth, and prevent complications while minimizing the adverse effects of medications. Important considerations are required when treating children and adolescents with IBD include attention to the effects of the disease on growth and development, bone health, and psychosocial functioning.

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INTRODUCTION:

Inflammatory bowel diseases (IBDs) is characterized by recurrent episodes of abdominal pain, bloody diarrhea and weight loss. Crohn disease (CD) and ulcerative colitis (UC), which have almost similar diagnostic and treatment protocol approaches are the two types of IBD.[1] The prevalence of IBD in childhood is between 2 and 3.5 per 100,000 in the United States and Europe with peak prevalence during adolescence. Gender distribution is equal[1]. Children with IBD, particularly CD, mostly have malnutrition, growth failure and pubertal delay .[2, 3]

Epidemiologic data derived from studies in the pediatric population have a potential to enable us to develop better understanding of IBD etiology, especially environmental factors, as well as clinical features, which then may allow for prediction of natural disease course. The diagnosis of IBD in children comes often at a vulnerable time of growth and development. Despite the increased nutritional needs related to the rapid periods of growth during childhood and adolescence, many pediatric patients afflicted with IBD will paradoxically demonstrate decreased appetite, increased metabolism, and decreased absorptive capacity. As a result, IBD may have profound effects on weight gain, linear growth, and bone mineralization, some of which may not be reversible. Additionally, delayed sexual development may have significant adverse effects on self-esteem and socialization. Beyond treating the overt symptoms of disease, therapy in children with IBD must be directed toward overcoming nutritional deficiencies to allow the maximal potential for growth[4, 5]. These issues add a level of complexity to the management of a child or adolescent with IBD. Finally, there is the issue of health care transition to adult oriented health system. This issue was the main topic of several recent conferences that emphasized the need for a development of uniform guidelines designed to help both the patients and their families, as well as health care providers through this process.

Epidemiology

The inflammatory bowel diseases (IBDs), including ulcerative colitis (UC) and Crohn disease (CD) are chronic inflammatory disorders of the gastrointestinal tract that begin most commonly during adolescence and young adulthood. Approximately 25% of patients with IBD present before age 20 years.[1, 10] Among children with IBD, 4% present before age 5 years and 18% before age 10 years, with the peak onset in adolescence.[2] The prevalence of pediatric IBD is approximately 10 /100,000 children per year in the United States and Canada and is rising[17] with a prevalence of 100 to 200 /100 000 children per year in the United States, most pediatricians will treat children with IBD in their practices.[7]

Epidemiologic data on the age of onset of IBD in 1074 pediatric patients from pediatric consortium includes Up to 31% of children in this series had a member of extended family with IBD, while 4% and 12% had a sibling, or parent with a history of IBD, respectively. Overall, the sex distribution of IBD among children indicates slightly increased preponderance of Crohn's disease (CD) in boys [9], while ulcerative colitis (UC) affects both sexes equally.

Pathogenesis

In patients with IBD, some genetic, environmental, and microbial growth factors converged as a result of this deviate mucosal immune response from normal function to against the commensal intestinal microbes.[26] Recent technologic advances have led to an explosion of discovery of the genetic and microbial influences on IBD. Genome-wide association studies have identified common variants in more than 150 genes that confer risk for IBD. Risk variants can be grouped into biological pathways that shed light on IBD pathogenesis, including innate and adaptive immunity and epithelial function. No difference exists in the common risk genes between pediatric-and adult-onset IBD; however, early-onset IBD may be associated with a higher burden of common risk variants and rarer variants with high penetrance.[27]

Table 1: Risk factors of IBD

Genetic	One of the genes present on 7chromosome in human genome, multi resistance (MDRI), found to have a link with UC pathological process.[28]
Environmental	Studies showed that changes in geography have connection with prevalence of IBD, the women resident in northern latitude are more pronounced to both CD and UC, it may be due to lesser exposed to sunlight or ultraviolet radiation.[29]
Stress and physical activity	Intrinsic factors such as inadequate sleep and psycho- discomfortness are being correlated additionally with inflammation and the inflammatory system. It is explored that disturbed sleep cycle is commonly found in IBD patients.[31] It is also known to have a recurrent clinical etiology of symptoms described to be depression,

	uneasiness and anxiety. Moreover, variation in sleep wake cycle or internal clock and their insufficiency has a well-known influence on pathway of severity of disease.[32]
Medication	Exposure to antibiotic in children in early age and adults with acute gastroenteritis medications have the high susceptibility to develop IBD.[33] Consistent use of NSAIDs (non-steroidal anti-inflammatory drugs) like aspirin exhibit a strong correlation with CD.[34]
Gut microbiota	Compositional changes in normal micro-gut flora can lead to trigger the abnormal inflammatory responses. In patients with IBD, Firmicutes species, such as *Faecalibacterium prausnitzii*, has been evaluated to be awfully in comparison with healthy person.[30]

Diagnosis

Clinical Presentation

The presentation of IBD in children and adolescents can be variable. The reported incidence of presenting signs and symptoms is detailed in the Table 2. Pediatricians and other primary care clinicians should become familiar with the atypical presentations of IBD because 22% of children present with growth failure, anemia, perianal disease, or other extra intestinal manifestations as the only predominant initial feature. A complete family history should be taken because 20% of children with IBD have an affected relative.

Table 2: Frequency of common presenting symptoms of CD and UC disease

Symptom	Crohn's disease (%)	Ulcerative colitis (%)
Abdominal pain	62–95	54 – 76
Diarrhea	52–78	67 – 93
Hematochezia	14–60	52 – 97
Weight loss	43–92	22 – 55
Fever	11–48	4 – 34

Extra intestinal manifestations of IBD

Patients with IBD are increasingly at high risk due to originated symptoms in areas other than the gastrointestinal track. These extra intestinal manifestations may be because of underlying genetics, bacterial products, or the medication adverse effects used for disease treatment, and circulating inflammatory cytokines.[23] However, physicians involved in treatment with IBD patients were reported extra intestinal manifestations (EIMs) diagnosis in 26% of children. EIMs were seen 30% higher in children with CD while 21% in children with UC and prolong joint pain with CD 20%, UC 14%, including arthralgia, arthritis, ankylosing spondylitis, followed by evolving liver diseases, such as drug-related disorder increased liver function, Primary sclerosing cholangitis, autoimmune hepatitis, or cholelithiasis 0.3% with CD, 1.2 % UC.[3] Many other complications related to dermatological issues such as erythema nodosum painful nodules usually perceive on shins of patient and pyoderma gangrenosum, perianal disease,[25] metastatic Crohn's disease, history assessed the medication adverse effects and disorder severity for pediatric patients with IBD, may suffer from a musculoskeletal disorder, and osteopenia, avascular necrosis mostly in treatment with corticosteroid therapy.[24]

Disease distribution and natural history of IBD in children versus adults

The anatomic distribution of IBD is an important clinical feature, which when thoroughly documented and described allows for improved comparisons of response to therapy and natural history among reported studies.

Crohn's disease

In 139 adult patients with CD at the time of diagnosis 27% had small bowel, 28% large bowel, and 43% ileocolic disease. The extent of disease progressed with time and, eventually 75% of patients had ileocolic disease, whereas 88% underwent at least one operation. Pooled data of 14 pediatric studies with a total of 1153 children with CD revealed isolated small bowel disease in 38%, small bowel and large bowel in 38% and large bowel alone in 20% of cases. In children 10 years of age and younger 40% had ileocolonic disease, which over time increased to 60%, and 43% of patients required surgery. In the authors series of children 5 years of age and younger, isolated small bowel disease was seen in 11%, small bowel and large bowel in 59%, and isolated large bowel disease in 30% of cases.[7, 14] Perianal disease was seen in 11% to 18% of children with CD, while in children younger than 5 years of age the documented rate was significantly higher at 34%,

similar to adult rate of 36% to 46%. Upper gastrointestinal CD is seen in 30% to 40% of children, while endoscopic studies have shown even higher rates of up to 80%.[11] The studies of natural course of CD in adults more likely indicate a benign course if patients stay in remission in the year after diagnosis. However, predicting the course is difficult until 2 years into the course of disease. Early age at diagnosis was shown to be associated with more complicated disease in adults, although a more recent study indicated that age had no influence on change of location or behavior of the disease.[6, 7] Studies on the natural course of disease in children with CD are lacking. In one study children with ileal disease had a better prognosis than ones with ileo-colonic disease. In a series of 100 consecutively diagnosed prepubertal patients from Toronto, one third had mild disease never requiring corticosteroid therapy, and one third had at least one exacerbation requiring corticosteroids.[18] An additional 19% of patients had chronically active disease, but achieved sustained remission with the use of immune modulatory or surgical therapy, and 10% of patients had chronically active steroid-dependent, or steroid-refractory disease. In the same series, 36% of patients required surgical therapy, which is significantly less than reported in earlier studies. The proportion of pediatric patients with CD requiring surgery was 28% in a recent study and it was shown to decrease over time, which was mainly attributed to advances in medical therapy.[12] After the year of diagnosis about 50% of patients with CD will be in a remission during any given year, and less than 1% of patients have only a single episode of disease activity.[16] In the series of 639 Swedish children with IBD, 8% of patients were 5 years of age and younger and almost half of these patients carried a diagnosis of indeterminate colitis (IC). The number of children diagnosed with IC is higher than that seen in the adult population. In a large multi-center adult study in Europe, 5% of adult patients were diagnosed with IC and a similar proportion of 6% was seen in a series of 475 patients newly diagnosed with IBD in Netherlands.[13] In the pediatric series of older children, 14% to 23% were diagnosed with IC. In a clinical trial with 82 children diagnosed with IBD at 5 years of age and younger, 23% were diagnosed with IC. Reasons for this difference are unclear, but one possible explanation is a longer duration of disease in adults with a better chance of establishing the specific diagnosis of CD or UC. Also, pediatric gastroenterologists have in the past exhibited a less aggressive approach to colonoscopy.[15] During the period from 1984 to 1995 in the study of pediatric IBD by Lindberg et al, the percentage of diagnoses made by colonoscopy as opposed to recto sigmoid scopy increased significantly from 50% during 1984 to 1986 to 90% in 1995. With recent more extensive colonoscopy and histologic sampling of the terminal ileum, the proportion of children diagnosed with IC is likely to decrease.

Ulcerative colitis

In UC, the distribution of disease is categorized as distal disease (disease involving the rectum, or rectum and sigmoid colon), left-sided disease (disease extending beyond the recto-sigmoid region), and pan colitis (disease involving the whole large intestine). In a large cohort of 1116 adult patients, the disease distribution was 63% with distal and left-sided colitis and 37% with pan colitis. Data compiled from several studies indicated that 14% to 37% of adult patients have pan colitis, 36% to 41% left-sided colitis, and 44 to 49% involve the rectum/sigmoid colon. Barton et al found that the distribution of disease in a group of 37 Scottish children with UC corresponded with seven additional studies in 357 aggregate patients. Proctitis was present in 22% of patients, left-sided colitis in 35%, and extensive disease or pan colitis in 43% of patients. Most recent pediatric epidemiologic study in 60 newly diagnosed patients with UC indicated high proportion of 90% of patients with pancolitis. The course and prognosis of idiopathic ulcerative proctosigmoiditis was studied in 85 young patients whose symptoms had begun before the age of 21 and the results were compared with those in onset of similar disease as adults. The natural history of proctosigmoiditis in young patients was found to be somewhat different from that in adults, being characterized by a greater tendency to proximal extension (38% versus 10%). When the disease remained confined to the rectosigmoid region, the course and prognosis were no different than in adults. Extension of the disease was unpredictable in individual patients, but occurred in 73% of patients within 5 years from the onset of symptoms in contrast to proximal extension that was noted in 27% of adult patients in a separate study. In a study by Langholz et al comparing clinical features and natural history of UC in Swedish children and adults, abdominal pain was more frequently found in children. The distribution of the disease was pancolitis in 29%, and proctitis in 25% of children, compared with 14% and 46% in adults, respectively. The cumulative colectomy rate after 20 years in childhood onset UC was 29%, which was the same as in adults. Extension of the disease was noted in 65% of the pediatric patients, and 70% of patients were in remission during 1 year. In a study at the Cleveland Clinic, pancolitis was seen in 63% of patients, left-sided colitis in 22%, and proctitis in 15%. In the largest reported series of 171 children with UC, 22% had proctosigmoiditis, 36% left sided colitis, and 43% pancolitis. Mild disease was initially seen in 43%, and moderate to severe in

57% of patients. Ninety percent of patients in the mild group had cessation of symptoms within 6 months, compared with 81% in the moderate to severe group. The response was independent of disease distribution and the overall 5-year risk for surgery was 19%. During any subsequent year of follow-up 55% of patients were symptom-free, 38% had chronic intermittent symptoms, and 7% had continuous symptoms.

Nutritional aspects of IBD

Treatment of children and adolescents with IBD is often based on experience first obtained in the adult population. Treatments become available in the adult population before the pediatric population, and many treatments never receive a formal pediatric indication. For many aspects of IBD, this is acceptable. However, there is a particular aspect of IBD for which there is no adult equivalent—the effects on growth and development. It is widely accepted that IBD has significant effects on nutritional status. A combination of decreased intake and increased metabolic demands present an especially large burden for the body afflicted with IBD. The situation is exacerbated by the already increased nutritional demands to maintain normal growth and maturation. When IBD is active during critical periods of growth, it is extremely difficult to compensate for the increased demands with oral intake alone. The effects of poor nutrition during childhood are long lasting, making the recognition and treatment of malnutrition a critical aspect for the care of children with IBD. By the time most children are diagnosed with IBD, they are already malnourished to a degree. Up to 85% of children with CD, and as many as 65% of those with UC, will have growth failure at the time of diagnosis. The earliest sign of growth failure may be decreased linear growth, with almost 90% of children and pre-pubertal adolescents demonstrating reduced height velocity before diagnosis, almost one-half of whom develop alterations in growth before the development of gastrointestinal symptoms. Poor intake may be the most important contributor to malnutrition in IBD.

Nutritional deficits

Development of macronutrients and micronutrients deficit is a major risk factor in children with CD, especially those with small bowel disease. Iron deficiency due to chronic occult blood loss. Mainly, diseased patient with high severity and anatomic position may be a reason for impaired absorptive processes and lead towards the deficiencies of specific micronutrients.[19]

Frequent appraisal of serum vitamin B12 and folate level should monitor for the patients with CD significant small bowel involvement, specifically those with extensive disease or entailing terminal ileum reactions. In such cases, patients have high susceptibility for the development of zinc deficiencyt.[20] Children presenting 10% to 40% with IBD, have been perceived reduction in bone mass. Moreover, patients involved CD compared to those with UC are more conspicuous to these deficiencies.[21] While it may affect the potential risk of bone fracture along the long term skeletal health. Therefore, Children with IBD need special health care to meet and assure adequate intake of vitamin D and Calcium.[22]

CONCLUSION:

Because of a complex nature of issues surrounding the care of a child or adolescent with IBD it is necessary to adopt a multidisciplinary approach, and devise an individual plan for therapy. In addition to parents, siblings, and family members, teachers and school nurse should also be part of the team. They should be informed about important aspects of IBD, especially symptoms. The medical support team ideally should include physician, nurses and nurse practitioners, nutritionist, social worker, and psychologist.The authors believe that a team effort is necessary to ensure comprehensive, state of the art, care which allows IBD patients to achieve appropriate levels of physical, mental, and social sense of well-being.

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