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Inflammatory bowel disease in adolescents: What problems does it pose?

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Abstract

Adolescents with inflammatory bowel disease face daily and long-term challenges that may be difficult for teenagers to manage. The developmental and psychosocial changes unique to this age group include becoming more autonomous and being more vulnerable to peer influence. These changes may lead to problems in medical management such as poor medication adherence and risky behavior. Being aware of these issues will help the medical team provide anticipatory guidance to address these concerns.

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INTRODUCTION

Inflammatory bowel disease (IBD) is one of the more common chronic illnesses afflicting adolescents, with an estimated prevalence in those younger than 20 years old of 71 per 100 000^[1]. Both Crohn's disease (CD) and ulcerative colitis (UC) present day-to-day as well as long-term challenges that can be particularly difficult for the adolescent patient. The developmental and psychosocial changes unique to adolescence, including establishing autonomy, risk-taking behavior, and undue susceptibility to peer influence make managing IBD in this age group more difficult.

MEDICATION ADHERENCE

Adhering to a prescribed medication regimen is difficult for teenagers. Adolescents need to remember to take medications amidst a busy lifestyle with school and extracurricular activities, and to accurately recall the types and number of medications to be taken at various times of the day. They can be particularly resistant to taking medications that cause cosmetic changes, choosing a better appearance over persistent IBD symptoms. The concept of maintenance therapy can also be challenging for teens who, once acute symptoms subside, often decide to stop taking medications "because I don't need them anymore".

A study by Hommel *et al*^[2] examined the problem of medication nonadherence in 42 adolescents with IBD. In addition to recording an objective measure of adherence

using pill count, they further evaluated the problem by determining the adolescents' subjective assessments of their adherence through standardized interviews. Subjects reported that they missed 6% of their 6-mercaptopurine/azathioprine (6-MP/AZA) doses and only 3% of the 5-aminosalicylate (5-ASA) medications. However, pill counts revealed that 38% of 6-MP/AZA and 49% of 5-ASA doses had been missed. Only 14% of patients had therapeutic levels of thiopurine metabolites, further confirming their poor adherence to the prescribed 6-MP/AZA regimen. The subjects who were nonadherent to 6-MP/AZA were also likely to miss 5-ASA doses. The frequent dosing and large quantity of pills per dose were factors associated with poor adherence to 5-ASA treatment.

A survey study by Greenley *et al.*³¹ of 64 adolescents and their parents found that 48% of teenage patients took one IBD medication or supplement, 36% took two, and 11% took three. Only 65% of adolescents reported perfect adherence. Common barriers to medication adherence included lack of time, medication side effects, feeling well, or belief that the medication was ineffective. Patients on polytherapy had more barriers to successful medication-taking than those on monotherapy. A similar study by Ingerski *et al.*⁴¹ found that the most common barriers to medication nonadherence included forgetting, being away from home, and interference with an activity.

Based upon these studies, physicians may help increase medication adherence by minimizing the frequency of doses and number of pills. When prescribing a new treatment, physicians need to carefully explain to adolescents why they need to take their medications as prescribed, especially when patients have low expectations that the therapeutic regimen will be effective, or are likely to experience side effects³¹. Physicians must also clearly communicate the concept of maintenance therapy, both when medications are first prescribed, and more importantly, during routine follow-up visits so that teenagers understand why they need to continue to take medications even when they are feeling well. Suggestions to help teens remember to take their medications include using a pill box, carrying an extra supply of pills, and setting an alarm as a reminder on a watch, cell phone, or portable electronic device.

GROWTH AND DEVELOPMENT

IBD may lead to growth failure and delayed puberty during adolescence. Pfefferkorn *et al.*⁵¹ examined growth outcomes in children with CD at diagnosis, 1 year, and 2 years using data from the Pediatric IBD Registry, a prospective, multicenter observational database established in 2002. The study found that the mean height z-scores were approximately -0.50 standard deviations (SD) at each of the three time points despite improvement in disease activity over the course of the observation period. Although the mean height velocity z-score increased between the first and second years, the proportion of

patients with a height velocity z-score less than -1 SD was similar and substantial (45% at 1 year and 38% at 2 years). Furthermore, all subjects in the study were Tanner I to III at diagnosis and at 1 year. At 2 years, 84% (92/110) of patients did not progress to Tanner IV. These data are disturbingly similar to those derived from patients diagnosed in the 1970s and 1980s, in whom periods of significant growth failure were demonstrated in 37% of young adults whose CD had been diagnosed before their adolescent growth spurt⁶¹. Despite advances in nutritional and anti-inflammatory therapy, promoting normal growth continues to be a significant challenge for the physician caring for adolescents with IBD.

Not only is height adversely affected in children with IBD, but bone mineral density (BMD) is as well. Sylvester *et al.*⁷¹ prospectively followed Caucasian children with IBD over a 2-year period from diagnosis. The mean total body BMD z-score at diagnosis was significantly lower for CD patients compared to healthy controls of similar age (-0.78 for CD, -0.46 for UC, and -0.17 for controls). CD patients with a BMD z-score lower than -1 tended to have a lower body mass index (BMI) and higher serum interleukin-6. Despite clinical improvement in the CD and UC patients over the follow-up period, the mean BMD z-score was unchanged for CD. Similarly, the mean BMD z-score for UC patients was unchanged from diagnosis to 1 year, but increased from the first to second year.

Sylvester's study⁷¹ also found that both CD and UC patients had decreased serum concentrations of biochemical markers of bone formation at diagnosis compared to controls. In addition, CD patients had a lower concentration of N-telopeptide of collagen, a marker of bone resorption, compared to controls. Over the course of the study, improvement in clinical status and nutrition was associated with increased concentrations of markers of bone formation but not of bone resorption. However, mineralization rates did not significantly improve, particularly in CD patients.

Dubner *et al.*⁸¹ evaluated the bone and muscle of the left tibia using peripheral quantitative computed tomography (pQCT) in pediatric CD patients. pQCT provides a 3-dimensional assessment of trabecular and cortical volumetric BMD (vBMD) and geometry, and a cross-sectional area of muscle and fat. Patients with CD had musculoskeletal deficits (in trabecular vBMD, cortical bone geometry, and muscle mass) at diagnosis compared to healthy controls of similar age. Six months after diagnosis, there was improvement in trabecular vBMD and muscle mass, but worsening of cortical bone geometry. One year after diagnosis, all 3 were still low compared to controls.

In addition to physical appearance, growth failure and delayed puberty may also affect psychosocial aspects of adolescent life. Looking different from peers may render teens to feel self-conscious or "abnormal". Teens may have difficulty "fitting in" with peers or dating because they appear less mature. Having short stature may also affect their ability to participate in or excel at sports, or at least give adolescents this perception. All these

factors may lead teens to become repeatedly frustrated, have low self-esteem, or seclude themselves.

Poor nutrition may contribute to poor growth. Patients may not meet their nutritional requirements because of inadequate caloric intake, malabsorption, or increased metabolic needs from chronic inflammation. Patients with CD are more likely to be malnourished than patients with UC. It is important to monitor nutritional status by anthropometrics, and checking blood for albumin and micronutrient levels (e.g. iron, folate, and B12). Patients who are undernourished or have micronutrient deficiencies should receive supplementation with oral or nasogastric tube feeds, or with specific vitamins or minerals. In addition, it may be beneficial for patients to take a daily multivitamin. Patients receiving sulfasalazine and/or methotrexate should be given folic acid supplements^[9]. Patients may also be referred to a nutritionist for evaluation of dietary intake and guidance on how to eat a healthy and appropriate diet.

PEER INFLUENCE

Peer influence is strong during adolescent years. This period is filled with the desire to be accepted, identity formation, intense introspection, and internal conflict. Teenagers may feel embarrassed or self-conscious about their body as a result of IBD, its complications, or side effects from medications. Patients may feel uncomfortable about their short stature, delayed puberty, body habitus (thin from malnutrition or weight gain from corticosteroids), surgical scars, or ostomy. Patients missing school or limiting extracurricular activities due to IBD flares or medical appointments may feel isolated from peers. Teenagers may not want to appear different from friends or raise suspicion about having a medical condition, especially one that involves potentially embarrassing topics such as diarrhea.

When adolescents are ready to share their medical condition with friends or someone they are dating, they must decide when is the appropriate time, and how to do so. Patients may want to let peers realize that disclosing this information demonstrates that patients trust their peers and that their relationship has reached a certain level. Patients may also explain that the disease does not define them as a person. In addition, adolescents should understand that they have the option of sharing only information which they are comfortable disclosing.

RISKY BEHAVIOR

Adolescents may participate in risky behaviors such as practicing unprotected sex, and abuse of alcohol and illicit drugs^[10,11]. It is common to hear adolescents explain their risky behavior because they think that bad consequences “won’t happen to me.” Adolescents with IBD are no exception, but their risky behavior can also take the form of discontinuing their medications without consulting their physician. Therefore, it is important for

the physician caring for adolescents with IBD to address risky behavior and provide anticipatory guidance. For example, adolescent IBD patients should be counseled about the importance of using protection if they decide to have sexual intercourse. If the female adolescent patient decides to use oral contraceptive pills, she should be aware of the possible increased risk of thrombosis^[12]. It is also important to explain that, although sulfasalazine can lower sperm counts, it should not be considered a method of contraception^[13].

If the teenage patient is pregnant, she may want to seek family planning to decide whether to continue the pregnancy. If the decision is to continue the pregnancy, it may be beneficial to transfer her to an adult gastroenterologist because internists have more experience with pregnancy and high-risk obstetrics than pediatricians. Patients should be encouraged to tell their physicians that they are pregnant because some IBD medications such as methotrexate are known teratogens and others may need to be monitored carefully during pregnancy. Conversely, some medications are safe during pregnancy but there may be a popular misconception that they are not (such as infliximab until 28 wk gestation)^[14].

Toxic ingestion (including alcohol consumption) and illicit drug use are other risky behaviors that are important to address. Teens may abuse alcohol and illicit drugs for various reasons, such as peer pressure, recreational use, emotional escape, pain control, or appetite stimulation. Regardless of their reason, alcohol and illicit drug use may have multiple adverse health effects including damage to the liver, an organ vital in metabolizing some medications used to treat IBD. In addition, intravenous drug use, unprotected sex, and having tattoos or body piercing are risk factors for contracting hepatitis B and C^[15-18]. Adolescents should also be informed that metronidazole must not be taken with alcohol, as it can cause a disulfiram-like reaction^[19].

TRANSITION TO AN ADULT GASTROENTEROLOGIST

Transition to an adult gastroenterologist provides older teenagers and young adults with a hospital or clinic environment that is appropriate for their age. In addition, adult gastroenterologists are more experienced than their pediatric counterparts regarding issues frequently encountered in adults such as pregnancy, fertility, and cancer surveillance. In addition, the process of transition promotes independence and better adherence with therapy because patients must learn to take care of themselves, be proactive in their medical care, form decisions, communicate with the medical team, and be a self-advocate^[20,21].

The transition may be stressful for everyone involved in the process: patients, parents, as well as pediatric and adult gastroenterologists. Patients and families must relinquish the familiarity of the pediatric medical team and institution to face a new one that may have a different practicing style and expect patients to be independent. The

adult gastroenterologist may subsequently be perceived as less concerned about the needs of the patients and their families. Pediatric gastroenterologists may be reluctant to transfer patients to an adult provider whose medical management may be different or who may be less familiar with the issues of adolescent patients. Adult gastroenterologists may see young adult patients as less mature or self-reliant, and their families as overly involved^[20].

Hait *et al.*^[21] proposed a timeline consisting of competencies patients should achieve and tasks the medical team should implement based on patients' age, to help promote a successful transition. Pre-adolescents (ages 11-13 years) should learn to identify their disease and medications (names, dosages, and major side effects). The medical team should present the idea of independent visits in the future and discuss the effects of exercise, sexual intercourse, and substance abuse on IBD. Young adolescents (ages 14-16 years) should learn to identify their medical team and be knowledgeable about their medical history (including prior procedures and tests), relevant family history, and the risk of medication nonadherence. The medical team should start to help patients to become more independent by addressing patients first and having the family step out of the room for part of the visit. However, it is important to explain that the medical team has a legal obligation to share certain aspects with parents. Patients should be taught how to contact the medical team, schedule appointments, and fill prescriptions. In addition, physicians should inquire about their patients' plans after high school and introduce the idea of transition. Older adolescents (ages 17-19 years) should be able to manage their medical needs, which include scheduling appointments and having a plan to attend them, asking and answering questions during their private conversation with the gastroenterologist, filling prescriptions and picking them up at the pharmacy, and being knowledgeable about their insurance. Physicians should discuss possible difficulties encountered in the transition process and provide names of prospective adult gastroenterologists.

When patients are ready to transfer care, transition is easier when there is stability in their disease and life. Transition is more successful when patients in college are transferred to an adult gastroenterologist after graduation and have acquired a job or started graduate school. Patients who do not plan to attend college may be transferred after securing housing and a job. A medical summary should be provided at the time of transfer^[21].

A survey by Hait *et al.*^[22] illustrated adult gastroenterologists' perspectives of the transition process. The survey of 363 adult gastroenterologists revealed that factors they believed were most important for a smooth transition were often lacking amongst their young adult patients. These factors included patients' knowledge about their medications (name, dose, and major side effects), medical history, and health effects of smoking, drugs, and alcohol. Adult gastroenterologists also considered it helpful that pediatric gastroenterologists should provide a medical summary of their patients. The vast majority of adult gastroenterologists thought it was important

that adult providers be familiar with adolescent medical and developmental issues, but a significantly low proportion felt proficient in this area.

CONCLUSION

In summary, adolescents have unique issues such as poor medication adherence, growth failure, peer influence, and risky behavior, which make managing teenage IBD patients more challenging. It is important for physicians to recognize these issues so that they are prepared to address patients and parents early to help improve adherence to medications, nutritional status, complications of IBD, social well-being, and the transition process.

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