

PSYCHOLOGICAL ASPECTS AND PSYCHOTHERAPY OF INFLAMMATORY BOWEL DISEASES AND IRRITABLE BOWEL SYNDROME IN CHILDREN

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Background. Despite holistic approach to psychosomatic medicine, gastroenterological disorders (GI) tend to be categorized broadly into "functional" and "organic". Major GI illnesses are Inflammatory bowel diseases (IBD) include ulcerative colitis and Crohn's disease. Both are chronic, with remissions and relapses over the years while irritable bowel syndrome (IBS) is a common, often disabling functional gastrointestinal disorder.

Methods. A literature review was performed using the National Library of Medicine PubMed database, including all resources within the period 1991-2008, additional references were found through bibliography reviews of relevant articles.

Results. *Psychological problems:* Higher scores of neuroticism, depression, inhibition, and emotional instability, are typical for many patients with chronic diseases and nonspecific for chronic gastroenterological disorders. Patients with chronic gastrointestinal disorders have impaired health-related quality. *Psychological treatments:* There have been few adequate psychological treatment trials in IBD. These achieved lower demands for health care rather than a reduction of anxiety or depression. Psychotherapy with chronic gastrointestinal disorders could lead to improve the course of the disease, changing psychological factors such as depression and dysfunctional coping and improving the patient's quality of life.

Conclusions. There seem to be "risk patients" in whom psychosocial components have a bigger influence on the course of disease than in other patients; and those would probably benefit from psychotherapeutic treatment. Psychological treatments help patients manage the psychological distress which worsens bowel symptoms and quality of life.

INTRODUCTION

In the 21st century a bio-psycho-social model of disease is being appraised. This implies an appreciation that genetic and early environmental factors may shape an individual's predisposition to disease, on which biological, psychological, and social variables may determine the onset and subsequent course of a clinical disorder¹. Despite the holistic approach to psychosomatic medicine, gastroenterological disorders tend to be categorized broadly into "functional" and "organic". This has some advantages and many disadvantages. The distinction helps facilitate research into the psychological factors that are important in the etiology, presentation, and outcome of the "functional" disorders. The research has been multi-disciplinary and has led to a clear conceptualization of the biopsychosocial model in gastroenterology². This is important because such disorders comprise approximately half of all new patients seen by gastroenterologists. The most prominent disadvantage of the functional and organic division is the apparent reinforcement of dualistic thinking; for example peptic ulcer, previously regarded as a psychosomatic condition, is now regarded as a purely

biological one, and psychosomatic aspects tend to be ignored³. Another problem is some gastroenterologists falsely equate functional with psychiatric, and may give the impression complaints based on a demonstrable abnormality (e.g. by gastroscopy visualization) are "real," whereas other complaints may be dismissed as they turn out to be only functional and are the responsibility of a psychiatrist or of the patients themselves. Since the mid-1990s, a symptom-based classification of the functional gastrointestinal disorders, the "Rome" criteria, has been developed⁴. This is similar in concept to the DSM⁵, and the use of these two schemas has greatly aided research into the psychological aspects of functional gastrointestinal disorders⁶. Such a classification has caused much discussion among gastroenterologists who are accustomed to making diagnoses on the basis of observable pathological abnormalities.

IBD include ulcerative colitis and Crohn's disease. Both diseases are chronic, with remissions and relapses over the years. Symptoms include diarrhea, abdominal cramps, pain, weight loss, and bleeding from intestines. Both biological and psychological factors are independent determinants of impairment in patients IBD. IBS is a

common, frequently disabling functional gastrointestinal disorder whose full range of symptoms (abdominal pain/discomfort with altered bowel habits such as diarrhea and/or constipation) is generally unresponsive to conventional therapy. The few effective medications developed specifically for IBS have either been withdrawn or severely restricted in response to concerns about safety, creating an urgent need to develop behavioral self management treatments that could train patients to adopt effective strategies for relieving symptoms unresponsive to available dietary or pharmacological agents.

A few years after Crohn's disease was firstly described⁷, speculations about psychosomatic etiology/influences arose and these were discussed in the same way as ulcerative colitis⁸. As a result, researchers tried to identify typical personality traits, specific conflict constellations and/or psychiatric abnormalities in the case of IBDs but these failed in consistency and specificity.

STRESS AND INFLAMMATORY BOWEL DISEASES

Psychosomatic research hypothesized some psychosocial factors could help trigger relapses. An increased stress appears to facilitate disease reactivation. IBDs can be affected by stress^{9,10}. Stress modulates colonic motility¹¹ and it influences the endocrine and immune system which are mediators of the inflammatory process. The disease activity in IBDs might be affected by stress-related factors (vasoactive intestinal protein, tumor necrosis factor α)¹². Elevated stress levels or life events increased the relapse risk in patients with ulcerative colitis¹³. IBS and IBDs have significantly greater stress burdens than controls¹⁰ and higher levels of psychiatric distress, alexithymia and somatosensory amplification¹⁴. Unlike short-term stress, the perception of chronic stress appears to increase the risk of exacerbation of ulcerative colitis¹³.

Active IBD is significantly related to impaired psychological functioning across a range of domains, whereas inactive disease is not¹⁵. IBDs in remission had similar psychological well-being to the non-inflammatory bowel disease community sample. In Crohn's disease patients, well-being was comparable regardless of whether remission was surgically or medically induced¹⁶.

In the Canadian Community Health Survey (sample size of 132,947 Canadians) the IBDs (4,441 participants) were more likely to experience fair or poor general health¹⁷. IBS patients reported higher levels of stress and poorer mental health than IBDs. When IBS or IBD coexisted with another chronic condition, active participation at home and at work was significantly more likely to be impaired.

IBS is also associated with several other conditions, notably other bowel disorders, chronic fatigue syndrome, and fibromyalgia^{18,19}. The presence of untreated psychiatric disorder predicts a poor outcome²⁰.

INFLAMMATORY BOWEL DISEASES AND QUALITY OF LIFE

Physical complaints as well as mental problems can adversely affect a patient's quality of life (QOL), as proved in studies of patients with ulcerative colitis and Crohn's disease^{21,22}. The number of patients with chronic functional gastrointestinal disorders is increasing and consequently the prevalence of psychiatric disorders. It is widely recognized that people with IBD have impaired health-related QOL^{20,23}, but recent studies emphasized concurrent anxiety and depressive and panic disorders as major causes of this impairment^{24,25}. In dyspepsia, psychological distress is a better predictor of health-related QOL than the severity of the dyspepsia²⁶. In IBS factors predicting health-related QOL are a combination of psychiatric disorders (depressive, panic, or neurasthenia) or symptoms (easily fatigued and low in energy) and severe bowel symptoms, notably pain²⁴.

Health-related QOL is impaired in IBS and dyspepsia sufferers compared with healthy controls^{25,27}. A recent thorough study found how the degree of somatization mediates the negative effect of anxiety and depression on the physical component score of the Medical Outcomes Scale SF-36 (limitations on daily life imposed by the illness, associated bodily pain, and impaired physical functioning)²⁵. The relation between impaired health-related QOL and subjects with IBS and dyspepsia can be explained by psychological factors. The depression reduction in the patients undergoing psychological treatments was associated with improved health related QOL²⁴.

In clinic studies, especially at tertiary care centers, there has been found an association between sexual and physical abuse and functional gastrointestinal disorders, but findings are not consistent^{28,29}. A high rate of reported childhood abuse is not unique to patients with functional gastrointestinal disorders because similar high rates are also reported by patients with other chronic or recurrent painful functional conditions, such as pelvic pain, headaches, and fibromyalgia^{30,31}. Since a history of abusive experiences is closely related to poor health outcomes (severe abdominal pain, marked impairment of functioning, and frequent visits to the doctor), there might be an association with concurrent psychiatric disorder rather than with history of abuse²³.

IBD RELATED PSYCHOLOGICAL AND PSYCHIATRIC PROBLEMS

There are high levels of psychiatric disorders across diagnostic groups such as IBS, functional dyspepsia, functional abdominal pain, and noncardiac chest pain^{32,33}. Anxiety is more prominent in first-time attenders with IBS, but depression seems to be more prominent in those with chronic symptoms and a long period without remission^{34,35}. The group of patients with gastrointestinal symptoms as a part of their panic disorder, may be an atypical group of functional gastrointestinal disorder

patients³⁶. IBDs have a higher prevalence of anxiety and depressive disorders than the general population, but a lower prevalence of these disorders than patients with functional bowel disorder⁵. The rate (21 – 35%) is similar to the one found in other patients with chronic physical illness³⁷. Depressive disorder appears to be more common in older patients and in those with a previous history of psychiatric disorder³⁸.

In a cross-sectional clinic-based study included patients with recent onset of both peptic ulcer and IBD³⁹ only 16% had defined psychiatric disorders but a further 32% had subthreshold psychiatric disorders. A recent onset of nonspecific symptoms of tension, worry, and irritability together with mild mood disorders was common in these patients with recent onset IBD or peptic ulcer.

Two prospective clinical studies of patients with IBD appear to produce conflicting results. During a 6-month follow-up period, one study found a strong association between change in disease activity and anxiety level and a weaker association with depressive symptoms⁴⁰. Changes in disease activity seemed to lead to changes in anxiety and depression. Beck Depression Inventory scores at baseline predicted number and timing of relapses during an 18-month follow-up period⁴¹.

The presence of additional gastrointestinal symptoms (defecation, bloating, altered bowel habit) is associated with the greatest impairment of health-related QOL of all patients with IBD⁴². Thus, the relationship between psychiatric disorders and IBD is unclear. Some investigators suggested a possible vulnerability of certain patients with IBD to develop a psychiatric disorder due to experiences that are independent of the disease process (e.g., childhood victimization and abuse) (ref. ⁴³).

Many authors report psychiatric disorder only in close relationship with increased disease activity, suggesting that the former may be a consequence of disease activity⁴⁴. A population-based linkage study identified contacts with psychiatric services for 5 years before and 5 years after the initial diagnosis of IBD in a total population of more than 2 million people during 36 year period⁴⁵. Both depression and anxiety were more prevalent during the year before diagnosis of ulcerative colitis compared with the control population. There was no similar excess of anxiety or depression before the diagnosis of Crohn's disease. However, both anxiety and depression were much more common in the year immediately following diagnosis of Crohn's disease and ulcerative colitis. The excess of anxiety or depression during the year subsequent to the diagnosis of IBD might be due to a reaction to the diagnosis of IBD, it could also result from the use of medication (steroids). These are impressive results, especially because this study included psychiatric patients only; though many people with anxiety and depressive disorders would not go to see a psychiatrist.

Important personality factors in ulcerative colitis were neuroticism and locus of control, while in Crohn's disease there was social conformity/desirability together with neuroticism⁴⁶. IBDs often have high level of dependence on others and low levels of hostility and aggression⁴⁷. Unlike patients with a high level of dependence on others, people

with internal locus of control are generally less distressed in stressful situations, which might be associated with better disease-specific QOL⁴⁸. In contrast, hostility and other aggressive personality traits might have a negative impact on the QOL. In adolescents with IBD, hostility is related to higher level of subjective illness, and hostility is generally related to poor health habits and interpersonal conflicts⁴⁹.

PSYCHOTHERAPEUTIC APPROACHES TO PEOPLE WITH IBD

The suspected connection between psychological factors and relapses leads to the question whether psychotherapy would be beneficial to IBDs. There have been a few adequate psychological treatment trials in IBD. Of these, lower demands on health care were achieved rather than a reduction of anxiety or depression. Psychotherapy with IBDs could improve the course of the disease, reduce psychological factors such as depression and dysfunctional coping and better the quality of life. Ten studies were conducted on the effects of psychotherapeutic treatment of patients with IBD⁵⁰. In all studies, patients received conservative therapy and, simultaneously, the psychotherapy was used as a supplementary treatment. The studies presented two main approaches of psychotherapy:

1. Psychodynamic therapy (including psychoanalysis and supportive-expressive therapy)
2. Behavioral therapy (predominantly stress management training). Psychodynamic therapy addresses more underlying problems and conflicts, and the behavioral therapy addresses more specific problematic cognitions and dysfunctional behavior.

STUDIES INVOLVING PSYCHODYNAMIC PSYCHOTHERAPY

The first study regarding the effectiveness of psychotherapy for ulcerative colitis was conducted 50 years ago⁵¹, but unfortunately, it was methodologically poor-quality. The effects of supportive psychotherapy on the course of the disease and coping skills in patients with Crohn's disease were investigated in 1987 (ref.⁵²). The scores for depression and anxiety decreased significantly during the 13 months while the study was being conducted. There were no differences in regard to most of the somatic data.

The effect of psychodynamic psychotherapy on patients with Crohn's disease was investigated in a randomized, multicenter study⁵³. The psychotherapeutic intervention consisted of psychodynamic psychotherapy (26 sessions) and autogenic training (17 sessions). After 2 years, a relapse has not been experienced by 23% of the control group and 30% of the therapy group. 29% of the control group and 17% of the therapy group had to undergo surgery. The therapy group had better somatic data than the control group but not significantly so. After 1 year, the scores for depression, anxiety, quality of life, and psychological symptoms did not differ significantly,

but mostly were within the normal range. In another study, the scores for maladaptive coping decreased significantly over the course of treatment in patients with IBD who underwent 20 weekly sessions of supportive-expressive group psychotherapy covered emotion-evoking issues and discussions about disease related topics (such as self-image, stigma, and conflict with health care professionals) (ref.⁵⁴).

COGNITIVE BEHAVIORAL THERAPY

Cognitive behavioral therapy (CBT) is a time limited, structured, problem focused, and prescriptive therapy based on two central underlying assumptions:

1. Symptoms are acquired (learned) and reflect specific skills deficits in domains of cognitive and behavioral functioning.
2. Teaching and rehearsing skills for modifying maladaptive behaviors and thinking patterns can remediate these deficits which, in turn, relieve symptoms.

Specific technical components of CBT protocols typically include: (a) information on stress and its relationship to IBS; (b) self monitoring of antecedent and consequent events associated with IBS flare ups; (c) problem solving strategies around stressors that aggravate symptoms; (d) muscle relaxation exercises for cultivating lower physiological arousal and increased sense of mastery over symptoms; (e) cognitive restructuring for modifying faulty threat appraisals that underlie physiological and emotional reactivity.

An overarching goal of CTB is to teach skills for patients to take proactive role in controlling symptoms, cope with emotional unpleasantness, and improve quality of life. CBT has been found to be effective in hospital patients with IBS, however recent trials have reported equivocal results^{55,56}. A number of clinical trials support the efficacy of CBT when administered over multiple (weekly) sessions by trained therapists in tertiary care settings^{57,58} – the outcomes include improvement in key gastrointestinal symptoms (pain, bowel dysfunction), quality of life⁵⁹, and psychological distress⁶⁰. CBT has practical limitations (high cost, shortage of adequately trained therapists, long waiting lists, time requirements) that hamper its clinical utility. As the “second generation” of IBS treatments under development, it is increasingly clear that efficacy demonstration is a necessary but not sufficient condition of treatment viability for IBS treatments.

Cognitive based models have been proposed in the etiology and maintenance of IBS: these patients are hypothesized to hold the faulty belief that they have an organic GI abnormality. Based on this schema, hyperalgesia would be a consequence of IBS⁶¹. Patients with IBS more selectively recall words describing GI sensations than neutral words compared to healthy controls⁶². A genetically predetermined visceral hypersensitivity can lead to symptoms of IBS. Patients become hypervigilant to GI sensations and develop cognitive distortions, interpreting the sensations

as threatening. These threats increase anxiety, which in a vicious cycle directly affects the gut, causing further symptoms of IBS⁶³. Both of the above hypotheses support a cognitive behavioral theory of IBS. Psychotherapists attempt to break the feedback loop described above by addressing dysfunctional cognitions such as catastrophic thinking and by decreasing overall anxiety. Due to CTB treatment, less negative thoughts were associated with greater amelioration of symptoms⁶⁴. Unfortunately, studies of psychological treatment trials in patients with IBS are of poor quality with small sample sizes, poor randomization or inadequate blinding¹⁹; or researchers use varying definitions of IBS⁵⁶. Nonetheless, several controlled trials have reported CBT, or CBT-like treatment, to be effective in patients with IBS.

No significant differences were found in a controlled comparison of individual versus group CBT for patients with IBS; at the end of treatment only 10% of the waiting list of control patients had improved bowel symptoms compared to 55% patients receiving individual treatment and 64% of patients receiving group treatment⁶⁵.

Individual CBT-like treatment

Individual CBT-like treatment in IBS patients was found to be superior to a self-help support group or a wait list control; both individual gastrointestinal symptoms and a composite index of overall symptoms were reduced⁶⁶.

The effectiveness of two stress management programs for patients with Crohn's disease was studied⁶⁷. Fewer complaints with fatigue, constipation, abdominal pain and distension were expressed by patients from group “A” (received 6 individual sessions of manualized stress management) and group “B” (received a self-directed stress management program and relaxation training) over control group “C” (conventional medical treatment).

A special summer camp proved to be helpful for children with IBD⁶⁸. The 9–16 year old children had no formal IBD educational classes but many informal conversations among the campers and between campers and counselors about their illness. The campers participated in leisure group activities such as swimming, basketball, arts. The total scores for health related QOL improved, and so did bowel symptoms scores, social functioning scores, and treatment interventions scores.

Patients after a 2 hour patient-orientated self management program had significantly fewer hospitalizations than control group during 1 year follow-up⁶⁹. However, the scores for quality of life, anxiety, and depression were not significantly different.

Patients with ulcerative colitis in remission participated in 60 hour training program of “Mind-Body-Therapy” including stress management training, exercise, Mediterranean diet, behavioral techniques, and self-care strategies⁷⁰. Statistically significant changes were noted only regarding the mental health scale and QOL. In contrast there were no differences concerning somatic data such as disease activity, endocrine, and immune parameters.

Female patients with functional bowel disorders (including IBS, functional abdominal pain, painful con-

stipation, and unspecified functional bowel disorders) showed statistically significant benefits when treated with CBT compared to patients treated with education only⁵⁵. Patients with comorbid depression did not appear to benefit from CBT.

Group CBT-like treatment

Reduction of abdominal complaints was greater in patients with IBS who received group CBT than those in a waiting list⁷¹. Additionally, patients who received group therapy developed a greater number of useful coping strategies and less avoidant behavior. The results persisted at 2 years follow-up.

6 hours of stress management training focused on planning techniques (time management, problem solving), communication skills, and relaxation (autogenic training) improved the disease activity and stress index in IBD⁷².

12 sessions of group CBT consisted of psychoeducation about IBD, factors of stress creation, coping strategies for disease-related and routine stress, and progressive muscle relaxation training⁷³. Even after 9 months of the therapy, patients with IBD had lower scores of depression and illness-related anxiety; in addition, female patients had better ability to cope.

A 12 hour educational program involved general information about anatomy, pathophysiology of IBD, therapy, and discussions⁷⁴. Higher knowledge scores and patient satisfaction remained 8 weeks; no significant effect was found in QOL or medication adherence.

Trials without psychotherapeutic effect

In contrast with the above findings, several trials found no therapeutic effect of such interventions and in one study, all patients with IBS showed significant improvement in self-reported GI symptoms, regardless of treatment type (CBT or relaxation training, or care as usual)⁵⁶.

Outpatient behavioral therapy with IBD had similar somatic symptoms and psychological variables to the waiting list control group⁷⁵. Most patients in the 12 hour therapy group (including information about IBD, progressive muscle relaxation, thermal biofeedback, and cognitive coping strategies), however, found the therapy helpful in giving them better ability to cope with the disease.

IBD patients with high anxiety scores participated in an 8 session group training program dealing with somatic and psychosocial factors of IBD and stress management⁷⁶. The patients were satisfied with the training, but 6 months after the training, none of the psychological instruments indicated a significant change.

Results of psychotherapy studies

The results of the psychotherapy studies can be summarized as follows: only one study showed an (indirect) influence of psychotherapy on the somatic course of the illness as fewer rehospitalizations and operations⁵². Most other studies failed to show such an influence. The results of the largest psychotherapy study were not statistically significant⁵³. Another studies illustrated the impact of a stress management program on disease related symptoms

such as fatigue, diarrhea, constipation, and abdominal pain^{67,72}. Some studies showed that psychotherapy influences psychological factors such as depression, anxiety, coping, and stress index^{52,72,73}, but this could not be repeated in others^{53,74-76}. Patients often believed they had profited from the intervention^{53,67,72,74-76}. The studies used very different psychotherapeutic methods (individual and group therapy, psychodynamic methods, behavioral therapy, relaxation therapy, and stress management training), with more frequent use of stress management training. Given the dearth of studies, it is not possible to decide whether one therapy is superior to another. Psychodynamic therapies and behavior therapy appear to have had similar results.

Conclusion based on review of psychotherapy studies in IBD⁵⁰:

- Psychotherapy does not affect the course of disease itself but influences the outlook of the patients and how they deal with their illness. Psychotherapy appears to have a positive impact on the patients' depression and anxiety and helps them cope with their illness. Somatic effects were found only seldom and inconsistently. In most of the studies, patients considered psychotherapeutic intervention as helpful in coping with the illness.
- Psychotherapy seems to be ineffective in patients already in the subclinical range before the intervention, when no further improvement is possible.
- The demand for psychotherapy varies significantly. A questionnaire distinguish the demand for certain types of psychological care for IBD patients (intensive/professional psychotherapy, disease-oriented counseling, and integrated psychosomatic care with focus on the interaction of bio-psycho-social state of the patient) (ref.⁷⁷).
- There is no proof that one therapy is superior to another. So far, there has not been a systematic comparison between the various therapies.
- Patients with Crohn's disease or ulcerative colitis might respond differently to psychotherapy. Overall, Crohn's disease patients have more psychological complaints⁴² which indicates a different starting position or a mentally and physically more challenging illness. Future studies should take this into consideration.

Overall, the existing results give no general indication that patients with IBD should undergo psychotherapeutic treatment. There appear to be "risk patients" in whom psychosocial components have a bigger influence on the course of disease than in other patients. These would probably benefit from psychotherapeutic treatment. The risk factors are: obvious psychopathology, especially depressive symptoms, (chronic) mental stress, interaction of stress and symptoms, dysfunctional coping techniques. A gastroenterologist considering psychotherapy or psychologist consultation for a IBD patient should ask following questions:

1. Is the patient under a lot of stress that could possibly trigger relapses?
2. How is the patient coping with the disease?
3. Does he or she express signs of depression?
4. Does the patient have a social support system?

Then the physician can decide, together with the patient and possibly a psychotherapist, about the most appropriate type of intervention. These recommendations are in concordance with the European evidence based guideline on the management of Crohn's disease, which indicates that psychotherapy is useful in IBD patients with psychological disorder, such as depression, anxiety, a reduced quality of life with psychological distress, a maladaptive coping with the illness⁷⁸. Currently, it is not known how or why CBT works, when it works, or how to optimize it so that it renders more robust effect sizes; since 23 – 30% patients do not respond adequately to CBT^{55,79}. CBT needs to be extended beyond the small number of academic facilities providing behavioral treatments into routine practice settings where the overwhelming majority of patients with IBS can be found. In short, developing more simplified, powerful, accessible, and cost-effective self management therapies depends on specifying theoretical change mechanisms and testing whether they are responsible for therapeutic improvements⁸⁰. Therapies such as CBT derive their therapeutic value by reducing comorbid psychological distress characteristic of more severe IBS patients⁶³. Psychological treatments help patients manage the psychological distress which worsens bowel symptoms and quality of life⁸¹. This view casts heightened psychological distress as a driving influence of symptom exacerbations and its reduction should be the primary goal of psychological therapies. In other words, CBT presumably improves GI symptoms by reducing comorbid psychological distress.

BARRIERS TO THE TREATMENT AND POSSIBLE EFFECTS OF INTERNET USAGE

A main barrier to CBT treatment is the acceptability of the treatment by "nonpsychiatric" population. Patients are likely to see a doctor's recommendation of CBT as a belief that symptoms are not real, but are instead imaginary⁸². Patients with "psychosomatic illnesses" often reject any implication that psychological processes affect their condition⁸³. Considering the current stigma of mental illness in our society today, this rejection is understandable.

Web-based treatment may play an important role in reducing this gap between demand and supply. In recent years, Web-based approaches have been increasingly used and Internet-delivered treatments showed to be an effective and inexpensive alternative to traditional treatments. Web-based programs cover therapeutic approaches such as behavioral activation, cognitive restructuring, mindfulness/acceptance exercises, and social skills training. Interventions can be delivered programmatically and reli-

ably, greatly extending the numbers and types of people who can be reached with services.

CONCLUSION

This model of irritable bowel syndrome requires both factors to be involved, the biological (prior infection, analgesic consumption, and possible genetic predisposition) and psychosocial (prior or recent severe stress, anxiety, depression, and somatization), which represent the archetypal "psychosomatic" paradigm. Although the full range of factors has yet to be worked out it is unlikely that a wholly biological model will supersede this psychosomatic paradigm.

Although the IBD has predominant physical factors, psychological factors are recognized too, (anxiety and depression after the diagnosis). As research methods develop in the 21st century, the interaction between psychological and biological variables will become clearer and could lead to treatment methods adjustment, being more holistic.

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