Functional Somatic Syndromes

Arthur J. Barsky, MD, and Jonathan F. Borus, MD

The term *functional somatic syndrome* has been applied to several related syndromes characterized more by symptoms, suffering, and disability than by consistently demonstrable tissue abnormality. These syndromes include multiple chemical sensitivity, the sick building syndrome, repetition stress injury, the side effects of silicone breast implants, the Gulf War syndrome, chronic whiplash, the chronic fatigue syndrome, the irritable bowel syndrome, and fibromyalgia. Patients with functional somatic syndromes have explicit and highly elaborated self-diagnoses, and their symptoms are often refractory to reassurance, explanation, and standard treatment of symptoms. They share similar phenomenologies, high rates of co-occurrence, similar epidemiologic characteristics, and higher-than-expected prevalences of psychiatric comorbidity. Although discrete pathophysiologic causes may ultimately be found in some patients with functional somatic syndromes, the suffering of these patients is exacerbated by a self-perpetuating, self-validating cycle in which common, endemic, somatic symptoms are incorrectly attributed to serious abnormality, reinforcing the patient's belief that he or she has a serious disease. Four psychosocial factors propel this cycle of symptom amplification: the belief that one has a serious disease; the expectation that one's condition is likely to worsen; the "sick role," including the effects of litigation and compensation; and the alarming portrayal of the condition as catastrophic and disabling. The climate surrounding functional somatic syndromes includes sensationalized media coverage, profound suspicion of medical expertise and physicians, the mobilization of parties with a vested self-interest in the status of functional somatic syndromes, litigation, and a clinical approach that overemphasizes the biomedical and ignores psychosocial factors. All of these influences exacerbate and perpetuate the somatic distress of patients with functional somatic syndromes, heighten their fears and pessimistic expectations, prolong their disability, and reinforce their sick role. A six-step strategy for helping patients with functional somatic syndromes is presented here.

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The term *functional somatic syndrome* refers to several related syndromes that are characterized more by symptoms, suffering, and disability than by disease-specific, demonstrable abnormalities of structure or function. Physicians in many medical specialties are increasingly confronted by patients who have disabling, medically unexplained, somatic symptoms and who have already arrived at a diagnostic label for their illness. The functional somatic syndromes have acquired major sociocultural and political dimensions. Their definitive status in public consciousness and popular discourse contrasts markedly with their still uncertain scientific and biomedical status. Patients with these syndromes often have very explicit disease attributions for their symptoms, and they resist information that contradicts these attributions (1, 2). These patients often have a strong sense of assertiveness and embattled advocacy with respect to their etiologic suppositions, and they may devalue and dismiss medical authority and epidemiologic evidence that conflicts with their beliefs (3).

The functional somatic syndromes include multiple chemical sensitivity, the sick building syndrome, repetition stress injury, chronic whiplash, chronic Lyme disease, the side effects of silicone breast implants, candidiasis hypersensitivity, the Gulf War syndrome, food allergies, mitral valve prolapse, and hypoglycemia. The incidence of several other functional somatic syndromes has apparently declined: chronic carbon monoxide poisoning; chronic mononucleosis; and symptoms resulting from exposure to video display terminals, carbonless copy paper, and weak electromagnetic fields. In three other syndromes—the chronic fatigue syndrome, fibromyalgia, and the irritable bowel syndrome—more uncertainty exists about the presence of demonstrable pathophysiology, but these syndromes are included in this review because they have extensive phenomenologic overlap with other functional somatic syndromes and the psychosocial factors discussed here apply to them.

Methods

English-language articles were identified through a search of the MEDLINE database from 1966 to

the present. The bibliographies of the retrieved articles were then searched for additional publications. Standardized or structured analysis of the identified papers was not possible because of variation in quality, design, and methods and because of the breadth of the articles included. Emphasis was given to empirical studies that used more rigorous diagnostic methods, larger samples, systematic analyses, appropriate comparison groups, and longitudinal follow-up.

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Historical Context

In the past, various conditions associated with the symptoms of functional somatic syndromes (such as headache, musculoskeletal pain, fatigue, gastrointestinal distress, memory difficulties, and insomnia) have arisen, attracted intense medical attention, and then declined in incidence. Neurasthenia, spinal irritation, chronic brucellosis, pinched nerves, railway spine, and soldier's heart were each initially thought to have a medical cause, but when no pathologic basis for these conditions could be established, they subsequently declined in incidence and prevalence. More recently, functional somatic syndromes such as mercury poisoning caused by dental fillings, symptoms resulting from use of video display terminals, and chronic mononucleosis have declined in popularity.

Somatic distress and medically unexplained symptoms have always been endemic to daily life, but the social and cultural characteristics of each era shape the expression, interpretation, and attribution of these symptoms. Thus, similar constellations of benign symptoms acquire different diagnostic labels and are attributed to different causes in different time periods (1, 3). A line of descent can be traced from the DaCosta syndrome through soldier's heart, shell shock, and battle fatigue to the Gulf War syndrome (4). Musculoskeletal pain in the workplace, which previously manifested as writer's cramp and telegraphist's wrist, is now termed *repetition strain injury* (5). There are similarities between railway spine, common in the early 20th century, and the more recent chronic whiplash syndrome (6).

Although the functional somatic syndromes are not new, patients who have these syndromes today differ from their predecessors by being less relieved by negative findings on medical evaluation and less responsive to explanation, reassurance, and palliative treatment (1, 7, 8). Several factors may account for this shift.

First, the authority and prestige of the physician have declined: The reassurance of one's personal physician and the opinions of medical and public health authorities are no longer as calming, reassuring, and palliative as they once were. With this erosion of physician authority and the increasing prevalence of a generalized antiscientific attitude (7), the determination that a functional somatic syndrome has no pathologic basis does not result in a rapid decline in the incidence of that syndrome, as it did in the past (8). This divergence of medical and scientific evidence and public opinion is particularly evident in the recent controversy over silicone breast implants (7).

Second, the current situation is powerfully shaped by the mass media (7–9), which often use hyperbole and uncritical reporting to portray the functional somatic syndromes (3, 7, 10, 11). Preliminary data, tentative findings, and the personal accounts of individual sufferers are reported as conclusive medical evidence (3, 12). The functional somatic syndromes are described as rapidly spreading epidemics, progressive and incapacitating, and some reports insinuate that powerful societal institutions are denying the existence of these syndromes to conceal their own negligence or culpability (3, 11). Such sensationalism and alarmism promote symptoms and distress (5, 13–17).

Finally, the contemporary climate is marked by the prominent political, legal, economic, and regulatory ramifications of the functional somatic syndromes (18–20). Individuals and organizations have strong vested interests in the status of these syndromes, and the actions of these persons and groups may reinforce sufferers' beliefs that their symptoms have a medical basis (21–24). The functional somatic syndromes form the basis for lawsuits and class actions seeking to attribute liability and fault. Medical specialists and clinics develop professional and financial stakes in one syndrome or another. Advocacy groups emerge to mobilize public opinion, influence scientific debate, and shape public policy. The functional somatic syndromes are a source of disputes over health insurance coverage; may propel the creation of environmental, occupational, and workplace regulations; and may qualify sufferers for worker's compensation or disability benefits.

Overlap and Common Characteristics

Each functional somatic syndrome is seen in a heterogeneous group of patients. In some patients, symptoms are attributable to a known disease entity; in others, they result from an unrecognized disorder that may involve physiologic or immunologic hyperreactivity and perceptual hypersensitivity. Other patients have symptoms that are caused by a

psychiatric disorder, and still others have symptoms that are best understood as a response to stressful life circumstances. Our knowledge of the functional somatic syndromes is incomplete, and we do not fully understand the etiologic roles of biological, psychological, and sociocultural factors in these syndromes. Although complex, poorly understood, and heterogeneous, the functional somatic syndromes nonetheless have enough in common to justify our discussing them together as variants of a common biopsychosocial process.

The similarities seen in the functional somatic syndromes have led some to propose that they share a common pathophysiology. Thus, they have been conceptualized as variants of "affective spectrum disorder" because a significant fraction of patients who have these syndromes respond to antidepressant medications of different, unrelated chemical classes (25–27). It has also been suggested that the functional somatic syndromes all involve the same pathophysiologic dysregulation and blunting of the central nervous system's response to stress (28). Further research may shed light on these interesting hypotheses, but they are currently largely speculative.

Phenomenology

Although individual functional somatic syndromes may present with some organ-specific symptoms and may differ with respect to which symptoms are most prominent (for example, neck pain in chronic whiplash and gastrointestinal symptoms in the irritable bowel syndrome), they generally lack characteristic clinical presentations or distinct symptom complexes that are consistent across cases and that distinguish the syndromes from one other (29, 30). The various functional somatic syndromes have remarkably similar symptoms that share two important characteristics: They are diffuse, nonspecific, and ambiguous, and they are very prevalent in healthy, nonpatient populations (31). Symptoms common to the functional somatic syndromes include fatigue; weakness; sleep difficulties; headache; muscle aches and joint pain; problems with memory, attention, and concentration; nausea and other gastrointestinal symptoms; anxiety; depression; irritability; palpitations and "racing heart"; shortness of breath; dizziness or light-headedness; sore throat; and dry mouth.

All of these symptoms have a high incidence in the general population. Surveys of healthy persons who are not patients show that fatigue, headache, joint aches and stiffness, upper respiratory symptoms, and diarrhea are common and generally resolve spontaneously, usually within 1 month (32). Significant fatigue, for example, is reported by more than 20% of adults (33–36), and 30% of persons report current musculoskeletal symptoms (37).

Eighty-six percent to 95% of the general population has at least one somatic symptom in a given 2- to 4-week period (32, 38–41). The typical adult has a symptom every 4 to 6 days (32, 39), and 81% of healthy college students report having at least one somatic symptom in a 3-day period (42).

Overlap and Co-occurrence

The functional somatic syndromes have a high degree of overlap and co-occurrence (28, 43–45). Because the conditions are phenomenologically similar (31), the same person often meets the diagnostic criteria for several functional somatic syndromes simultaneously. Considerable overlap has been reported between multiple chemical sensitivity and repetition stress injury (46); between fibromyalgia and the chronic fatigue syndrome; between fibromyalgia and the irritable bowel syndrome (47–51); among multiple chemical sensitivity, the irritable bowel syndrome, and the Gulf War syndrome (31, 45, 50, 52, 53); and among the chronic fatigue syndrome, multiple chemical sensitivity, and fibromyalgia (31, 52). Over time, the same person may believe that he or she has several different functional somatic syndromes (43), a process referred to as *pathoplasticity* (1), and the diagnostic label given to a particular patient may be as strongly influenced by the context and medical specialty of the diagnostician as by the patient's symptoms (54). Confronted with the same polysymptomatic patient, a rheumatologist may focus on upper-extremity symptoms and diagnose repetition stress injury, an internist may inquire into constitutional symptoms and suspect the chronic fatigue syndrome, an allergist may diagnose the sick building syndrome, and a gastroenterologist may focus on bowel symptoms and identify the irritable bowel syndrome (54).

Epidemiology

The functional somatic syndromes have several epidemiologic similarities. They often begin in limited, sporadic outbreaks among small groups of people who are in close contact with each other (such as residents of small, rural towns; coworkers in the same office; or members of particular military units) and then "spread" to other persons with similar risk profiles after widespread publicity and alarm (1–3, 46, 55–60). The pattern of these epidemic-like outbreaks at first suggests infectious contagion or a common toxic agent. Epidemiologic scrutiny, however, shows that the spread occurs along lines of interpersonal communication, acquaintance, and familiarity as well as with physical proximity or exposure to the suspected "pathogen" (1, 5, 18, 20, 43, 46, 61). Prevalence rates vary widely in similar populations exposed to the same putative etiologic agent (62–64), and similar groups in various geo-

graphic locations do not necessarily develop a given syndrome (for example, keyboard operators outside of the United States, England, and Australia develop repetition stress injury less frequently, and non–English-speaking troops deployed to the Persian Gulf did not develop the Gulf War syndrome as often). No dose–response relation can be firmly established (5, 16, 66–70), and no pathogenic toxin, infectious agent, or physical vector is discovered after extensive evaluation (5, 46, 68, 71).

Comorbid Psychiatric Disorders

Patients with functional somatic syndromes have elevated rates of psychiatric disorders, particularly anxiety, depressive, and somatoform disorders. The cause-and-effect relation between the functional somatic syndromes and psychiatric disorders is widely debated because it is often difficult to determine which condition is antecedent and which is consequent (72). Nonetheless, the prevalence of axis I psychiatric disorders, both current and lifetime, is clearly higher in patients with functional somatic syndromes than in the general population or in similar groups of medically ill patients (18–20, 28, 44, 49, 50, 71–75). For example, the prevalence of psychiatric symptoms and psychiatric diagnoses is significantly higher in patients with fibromyalgia than in patients with rheumatoid arthritis or in healthy persons (25, 26, 76–80). Patients with the irritable bowel syndrome have more psychiatric diagnoses, personality disorders, and psychiatric symptoms than patients with inflammatory bowel disease do (81–84). The prevalence of premorbid and current psychiatric disorders is higher in patients with multiple chemical sensitivity than in numerous comparison groups (18, 19, 29, 71, 85), and elevated rates of anxiety and depressive disorders have been seen in several populations with the chronic fatigue syndrome (44, 73, 86–93).

Patients with functional somatic syndromes, including those with the chronic fatigue syndrome, multiple chemical sensitivity, fibromyalgia, and the irritable bowel syndrome, also have a higher prevalence of somatization, somatoform disorders, and medically unexplained symptoms that are unrelated to the functional somatic syndromes (19, 20, 44, 71, 72, 84, 92, 94–101). In some studies, somatization (the experiencing of somatic symptoms that do not have a demonstrable medical basis, the belief that these symptoms are due to demonstratable disease, and the seeking of medical attention for them) predates the onset of the functional somatic syndromes (4, 74); this suggests a preexisting tendency to experience and report bodily distress. For example, a group of patients with multiple chemical sensitivity had significantly more medically unexplained somatic symptoms and a higher prevalence of soma-

tization disorder before the onset of multiple chemical sensitivity than a comparison group did (71). However, somatization occurs in almost everyone at some time and to some degree and does not itself indicate a psychiatric disorder. Because the functional somatic syndromes are determined by multiple factors and are much shaped by psychological, sociocultural, and circumstantial forces, they resist localization anywhere within our medical or psychiatric taxonomy.

Refractoriness to Treatment of Symptoms

The functional somatic syndromes are often refractory to usual medical treatments and standard palliative measures (2). Epidemiologic comparisons of patients who have self-diagnosed functional somatic syndromes with community residents who report the same symptoms suggest that refractoriness, chronicity, and intractability of symptoms are more characteristic of the former group. In those functional somatic syndromes for which an environmental cause is postulated, improvement does not reliably result from control or elimination of the putative toxic agent (46, 102–104). When a physical activity is thought to be pathogenic, rest and physiotherapy are generally not effective (46, 104–106). When restriction of a patient's activities and functioning fails to relieve a given symptom, this is often regarded not as evidence against the putative cause-and-effect relation but rather as an indication that the restrictions were not stringent enough. Patients are thus caught in a vicious cycle in which the ineffectiveness of a treatment strategy leads to its intensification rather than its abandonment.

Amplification and Maintenance of Somatic Symptoms

An Explanatory Model

No single mechanism accounts for the functional somatic syndromes, but the knowledge we have is enough to suggest an explanatory model for the genesis and maintenance of these conditions (11, 107). Distressing symptoms are omnipresent in daily life. They result from benign dysfunctions and self-limited ailments; chronic medical conditions; psychosocial stress; psychiatric disorders; and, less frequently, previously unknown or unrecognized medical conditions. Under the influence of medical scrutiny, public health concern, and media attention, a process of symptom amplification that alters the perception of these endemic symptoms can be set in motion. Learning about a disease of which we were previously unaware (through personal contact with a sufferer, word of mouth, or the media) may lead us

to tentatively reattribute previously ill-defined or treatment-resistant chronic symptoms to the "new" disease (74, 108). (For example, nasal stuffiness and headaches may be ascribed to the sick building syndrome.) This reattribution then amplifies the symptoms themselves, making them seem more intense, noxious, and troublesome (107, 109, 110). The assumption that one is seriously ill also heightens self-scrutiny and prompts a confirmatory search for other symptoms to corroborate one's suspicions. Ambiguous sensations that were previously ignored, dismissed as innocuous, or never consciously noticed are now interpreted as further evidence of the presence of the suspected disease (107, 109, 110). A self-validating and self-perpetuating cycle of symptom amplification and disease conviction ensues: The suspicion of disease heightens bodily awareness, symptom perception, and distress, and these, in turn, reinforce the belief that the sufferer is sick.

This process of confirmatory bias and symptom amplification operates in each individual sufferer. It may also serve as a mechanism for "transmitting" the syndrome from one person to another. A new syndrome may first appear when a few persons with an unusual or previously unknown or ill-defined medical condition are recognized. Under the influence of growing medical and public attention, these persons serve as a nidus around which aggregate other persons who have similar symptoms but do not actually have the same underlying condition. Media publicity, sympathetic physicians, special clinics devoted to the condition, hotlines, litigation, disability compensation, and patient advocacy groups serve as vectors and propel this amplification of symptoms and reattribution of preexisting somatic distress. This process is mediated by four mechanisms: the belief that one has a disease, negative expectations about the future course of the disease, the sick role, and stressful events.

The few persons originally affected may serve as a template for others with similar, preexisting symptoms who reattribute their symptoms to the functional somatic syndrome about which they have recently learned. Sociocultural forces then reinforce the reattribution and, ultimately, the symptoms themselves. Some persons (for example, those with a history of trauma, those with psychiatric disorders, those undergoing major life stress, and those whose families or caregivers reinforce their symptoms and illness behavior [2, 111, 112]) are more vulnerable to this process of amplification. The following discussion focuses on the four specific mechanisms involved in symptom amplification. These amplifiers were selected because they are particularly salient in perpetuating and in maintaining patient distress and because we have empirical evidence about their roles.

Psychosocial Factors That Amplify Symptoms

The Belief That One Is Sick

Bodily perception is an active, not passive, process. Myriad somatic and visceral stimuli are constantly filtered in the brain, and only a small fraction reach conscious attention (109, 113–115). Our suspicions about the causes of our sensations guide this filtering and appraisal process: Sensations thought to have pathologic significance are selected for conscious attention and are amplified. The influence of cognitive beliefs on somatic perception is evident in studies showing that disease labeling results in decreased psychological health and increased absenteeism (116). For example, patients who did not know that they were hypertensive show a threefold increase in days of work missed after diagnosis; this effect is independent of the antihypertensive regimen (117). In a prospective study of herpes zoster (118), the persistence of pain at follow-up was predicted by the extent of the patient's conviction about the disease at inception. Among patients with chest pain but not serious coronary artery disease, the persistence of pain was predicted by the patient's earlier belief that he or she was prone to serious heart disease (119). Similarly, the persistence of fatigue after viral infection has been associated with the patient's belief in his or her vulnerability to viruses and with the tendency to ascribe ambiguous bodily symptoms to disease (120). In two prospective studies of the chronic fatigue syndrome (22, 23), the strength of the sufferers' belief that their fatigue had a medical basis predicted poor subsequent symptomatic outcome. Finally, patients' convictions that they had severe lactose intolerance led them to misattribute various benign abdominal symptoms to this disorder (67).

Beliefs about disease also bias recall of past symptoms (121). In a comparison with uninjured controls, patients with whiplash were found to underestimate their preinjury history of neck symptoms (62, 122). Compared with women who had less negative views of menstrual distress, women who believed that menstruation is a negative experience recalled past menstrual periods as more symptomatic than they had reported them to be when they were experiencing them. The two groups of women did not differ, however, in their recall of intermenstrual symptoms (123). Similarly, informing healthy volunteers in an experiment that they had just tested positive for a disease caused them to recall symptoms that were said to characterize that disease and to recall more behaviors that were described as risk factors for the disease (124).

Thus, the more convinced patients with functional somatic syndromes are that their symptoms are serious and pathologic, the more intense, pro-

longed, and disabling the symptoms become. Such symptom amplification is fostered by physicians who prematurely focus exclusively on medical explanations for the symptoms, by alarming anecdotes in the popular press and on the Internet, and by organized campaigns to designate a particular syndrome as a serious disease (24, 125, 126).

Future Expectations and the Role of Suggestion

Suggestion amplifies and maintains symptoms because humans tend to perceive what they expect to perceive. The cognitive processing of current bodily sensation is guided by our expectations of what we will experience next. This was shown in a multicenter study of aspirin treatment for unstable angina (127). Patients whose informed consent forms explicitly mentioned possible gastrointestinal side effects had a significantly higher incidence of gastrointestinal symptoms (but not confirmed gastrointestinal disease) than did patients whose forms did not specifically mention these effects. Six times as many patients in the former group withdrew from the study because of gastrointestinal distress (127). In patients with the chronic fatigue syndrome, extremely negative expectations about the future consequences of exercise are associated with higher levels of fatigue and disability (128). Similarly, patients who are more concerned about the seriousness of whiplash at the time of injury have longer lasting symptoms (129), and the expectations of patients with mild head injury with regard to future symptoms explain as much of the variance in symptoms as the injuries themselves (62). The power of suggestion has also been shown to influence healthy persons: Instructing persons to attend to evidence of "nasal obstruction" as they breathed induced more symptoms than instructing them to attend to the "free passage of air" (109). Similarly, headache was induced in volunteers who were told that a mild electric current that produces headache would be passed through their heads, when in fact no electricity was administered (130).

Studies of communities exposed to toxic waste pollution are also relevant. Compared with residents of unexposed communities, exposed residents report a broader range of somatic symptoms than can be attributed to the pollutant, and symptoms are most prominent in persons who believe that toxic waste and environmental pollution are more threatening and dangerous (131–133). Media coverage, community and legal action, and allegations of cover-ups alter the perception of normally occurring benign symptoms in those who expect to become sick, causing them to misattribute symptoms to the pollutant (131, 132). One explanation for the increased incidence of somatic symptoms in Gulf War veterans may be the suggestions made by the media, some

medical professionals, and advocacy groups about the negative health consequences of suspected toxic exposures (126). Similarly, persons investigating repetition stress injury have concluded that exaggerated media reports of this condition's seriousness and suggestions that the condition is progressive and incapacitating perpetuate the symptoms and disability associated with it (5, 16).

The Sick Role

Symptoms are also amplified by the act of becoming a patient. The assumption of the sick role can initiate far-reaching and pervasive changes—such as unemployment, altered social relationships and family dynamics, and medical help seeking—that in themselves amplify symptoms. Thus, the responses of family members, employers, and physicians to a patient's illness behavior can exacerbate or alleviate chronic pain and the symptoms of somatoform disorders (134–137), and the chronicity of medically unexplained symptoms has been empirically associated with such "secondary gains" (138). In general terms, social labeling theory posits that the connotations and implications of the label we apply to a condition or state influence the outcome of that condition or state. Once a person is labeled as ill, for example, he or she is regarded and treated in ways that make recovery more difficult: Continued illness is expected of the person, and symptoms therefore persist (139).

Health-contingent litigation, monetary compensation, and disability payments all have negative effects on symptoms (140). This was shown by a recent study of whiplash in a country that has little physician or public awareness of the syndrome, no litigation or compensation for it, and no involvement of insurance companies. Victims of rear-end motor vehicle accidents in this country did not have a higher incidence of postaccident headache and neck pain than did randomly chosen, uninjured, age- and sex-matched persons (63). A large body of literature indicates that injury compensation and worker disability payments are associated with a poorer symptomatic outcome after medical treatment and with a prolonged rehabilitative course (141–143). For example, recovery from surgery for the carpal tunnel syndrome is more prolonged and more symptomatic in persons who receive workers' compensation than in those who do not (144). Forcing someone to repeatedly prove that he or she is sick confounds the illness experience, impedes recovery from symptoms, and fosters invalidism (142, 145). When the continuation of benefits is contingent on the continuation of symptoms, the patient is trapped in the sick role. Thus, the incidence of repetitive stress injury is closely correlated with the availability and generosity of disability and workers'

compensation payments, and it declines after administrative and judicial decrees that it is not compensable (16, 104, 146).

When persons with functional somatic syndromes become patients and are given a diagnosis, they are admitted to the sick role. They may curtail or stop work, limit recreational or social activities, pursue legal action or receive disability compensation; read about their condition in magazines and on the Internet, meet and talk with fellow sufferers, and join an advocacy group. Although these steps may be adaptive and appropriate for some, they may also have unintended, long-term, negative consequences by strengthening expectations of future distress, reinforcing symptoms, and making recovery more difficult. Recovery is more difficult and requires greater face saving when sick role behaviors have become more extensive and ingrained: Clinical improvement may seem to call into question the patient's veracity or the legitimacy of his or her symptoms.

Stress and Distress

Stress exacerbates and perpetuates physical symptoms, lowers the threshold for medical help seeking, and makes us quicker to conclude that an ambiguous bodily sensation is due to disease (111, 147–152). Two types of stress are relevant: 1) daily life problems and recurring minor irritants and 2) major life changes and events requiring adaptation. Repetition stress injury, for example, is closely associated with daily stresses and hassles in the workplace and tends to occur when workers must adapt to a new technology that is demanding, threatens job security, and raises expectations for productivity. Clerical workers who report upper-extremity pain also report greater work demands, less control over their work, more job insecurity, and less camaraderie with their coworkers than do workers without such pain (153, 154). A similar relation exists between job stress and back pain (155–158), and perceived work intensity, mental strain, and stressful home lives are more common among workers who acutely develop the sick building syndrome (159). Recurrent, daily stresses have been shown to amplify pain in patients with rheumatoid arthritis (160, 161). Similarly, chronic whiplash symptoms 6 months after a motor vehicle accident were prospectively predicted by daily life stresses in the months before the injury, whereas neurologic signs did not predict subsequent distress (66, 162).

Stressful major life events have also been shown to amplify bodily symptoms. Natural disasters, such as floods (163–165); warfare; criminal victimization; and exposure to environmental pollutants (17, 166–168) result in medically unexplained symptoms. Emotionally laden stressors have been found to exacerbate or precipitate many functional somatic syndromes (28, 169–171). Military combat has resulted in a consistent syndrome of medically unexplained symptoms in U.S. soldiers since the U.S. Civil War (4, 17, 172). Medically unexplained somatic symptoms increase substantially in populations stressed by exposure to environmental toxins and in populations that are only rumored to have had such exposure (13–15).

Stress amplifies symptoms in two ways. First, because stress is widely known to be pathogenic, persons under stress are quicker to ascribe ambiguous bodily symptoms to disease rather than to attribute them to normal physiology, as they might otherwise do. Second, external stressors induce anxiety and depression, which have their own somatic and autonomic concomitants. Anxiety decreases the pain threshold and pain tolerance (173). It also causes apprehensive self-scrutiny and a sense of physical threat and jeopardy, which make symptoms more noxious, ominous, and worrisome (174–176). Depression, in addition to producing its own autonomic symptoms, amplifies and perpetuates other somatic symptoms (174–176). For example, patients who had more persistent and prolonged symptoms after an influenza outbreak were shown to have had higher levels of depression before becoming sick (177).

The more the functional somatic syndromes are thought of as ominous, incapacitating, and severe, and the more alarm and peril are associated with them (in short, the more stressful the experience of illness), the more intense and disabling symptoms become (5, 13–17).

Helping the Patient

The hyperbole, litigation, compensation, and self-interested advocacy surrounding the functional somatic syndromes can exacerbate and perpetuate symptoms, heighten fears and concerns, prolong disability, and reinforce the sick role. Excessive medical testing and treatment expose patients to iatrogenic harm and amplify symptoms. Exclusive emphasis on a search for structural abnormalities can distract physicians from eliciting the patient's beliefs, expectations, and personal circumstances. Patients with functional somatic syndromes can become so engrossed in establishing the legitimacy of their condition, so invested in discovering the cause of their symptoms, and so preoccupied with assigning fault and culpability that palliative treatment is made more difficult or is forgone.

Given these caveats, how should clinicians proceed? Medical management rests on six steps: 1) ruling out the presence of diagnosable medical disease, 2) searching for psychiatric disorders, 3) build-

ing a collaborative alliance with the patient, 4) making restoration of function the goal of treatment, 5) providing limited reassurance, and 6) prescribing cognitive–behavioral therapy for patients who have not responded to the aforementioned five steps.

First, clinicians must uphold their medical mandate with an appropriate search for a previously unrecognized medical disorder. In deciding how extensive this medical work-up should be, physicians must remember the adverse effects of overly aggressive investigation, of fostering the sick role, and of leading patients to expect a definitive medical explanation for all somatic distress. Caution is advised in ordering tests and obtaining specialty consultations solely to reassure the patient—negative findings provide little reassurance to most patients with chronic, medically unexplained symptoms and often ultimately heighten rather than assuage worry and anxiety (178–180). Furthermore, extensive medical testing carries the risk for iatrogenesis and solidifies the patient's conviction that his or her distress has a biomedical cause (24, 181). It is therefore helpful to have evidence-based guidelines for the appropriate extent of medical evaluation and the frequency with which such evaluation should be repeated. Currently, expert consensus has been promulgated for only a few functional somatic syndromes.

Second, the physician should search for diagnosable psychiatric disorders, particularly major depression and panic disorder (which are highly prevalent and treatable). Self-report screening questionnaires and brief, structural diagnostic interviews can assist the physician in this search. It is important to remember that the likelihood of a psychiatric diagnosis increases linearly with the number of somatic symptoms that the patient reports (97, 182–184). For example, compared with patients who have no pain, those who have medically unexplained pain at two sites have a fivefold higher prevalence of major depression, and those with three or more pains have eight times the risk for major depression (185). The stigma associated with a psychiatric diagnosis often makes patients feel that the legitimacy of their illness is being discounted and may make them cling more assiduously to a biomedical explanation of their symptoms (134). Patients must be assured that the presence of a psychiatric disorder in no way means that their somatic symptoms are imaginary or feigned. They should be told that psychiatric disorders are regarded less as causes of somatic symptoms than as amplifiers that exacerbate and perpetuate symptoms and impede recovery.

Third, a collaborative therapeutic alliance between physician and patient is crucial. The physician must take special care to acknowledge and legitimize the patient's suffering because a definitive biomedical explanation for the patient's symptoms has proven elusive. At the same time, the physician should discourage the patient from assuming the sick role, should undercut alarming expectations about the clinical course, and should avoid making distressing symptom attributions. Closely related to the establishment of a collaborative alliance is the process of making symptom palliation, coping, and rehabilitation the focus of the clinical enterprise. The goal of treatment becomes the identification and alleviation of factors that amplify and perpetuate the patient's symptoms and cause functional impairment. The focus is on coping rather than on curing, on improving functional status rather than eradicating symptoms. If this is to be accomplished, patients with functional somatic syndromes must be actively involved in the treatment process and must be dissuaded from assuming a passive role and waiting to be cured by medical procedures or interventions. Realistic, incremental goals should be set and should be specified in terms of observable behaviors. (For example, a gently graduated exercise program should be prescribed.) Patients should be encouraged to resume their activities as much as possible and to remain at work if they are at all able.

Limited, cautious reassurance is appropriate. Patients can be reassured that grave medical diagnoses have been ruled out and can be told clearly that they do not have a lethal or progressive disease. However, because these patients feel ill and symptomatic, it is not enough to tell them what they do not have without telling them what they do have. It is often helpful to describe the process of amplification, whereby sociocultural and psychological processes exacerbate distress and hinder recovery. Although it does not provide a definitive etiologic explanation for a patient's distress, such a discussion gives patients an explanatory model that focuses on processes and functioning rather than on structural abnormalities.

Finally, if these strategies are insufficient, cognitive–behavioral therapies can be effective in treating the persistent distress and disability resulting from functional somatic syndromes. Such therapies have been developed for the somatoform disorders and for some medically unexplained symptoms, including those of the irritable bowel syndrome, fibromyalgia, the chronic fatigue syndrome, headache, and atypical chest pain (186–198). Controlled intervention trials with long-term follow-up have shown the effectiveness of cognitive–behavioral treatment in reducing somatic symptoms, generalized distress, and disability (186–197, 199–204). These interventions help patients cope with symptoms by helping them reexamine their health beliefs and expectations and explore the effects of the sick role and of stress and distress on their symptoms. They help patients find

alternative explanations for symptoms, restructure faulty disease beliefs, alter expectations, and learn techniques of focused attention and distraction. Behavioral strategies, such as response prevention, systematic desensitization, graduated exercise regimens, and progressive muscle relaxation, help those with functional somatic syndromes resume normal activities, minimize role impairment, and curtail sick role behaviors. The cognitive–behavioral approach stimulates patients to assume a more active role in coping and rehabilitation, and it counters the assumption that cure results only from the application of technological interventions to passive patients.

The role of traditional psychotherapy is generally restricted to cases in which the patient with a functional somatic syndrome identifies a psychological problem or a source of emotional distress for which he or she wants treatment. Psychotropic medications are indicated when a pharmacologically responsive psychiatric disorder (such as major depression or panic disorder) is present. In addition, antidepressants sometimes alleviate somatic symptoms (particularly pain and insomnia) and may improve the functional status of patients who have functional somatic syndromes and subthreshold psychiatric disorders. The empirical evidence for the efficacy of antidepressants is strongest for the chronic fatigue syndrome, fibromyalgia, and the irritable bowel syndrome (27). Little is known about the use of alternative therapies in functional somatic syndromes. They may help some patients by providing an enhanced sense of self-efficacy and control over symptoms, but empirical data on this topic are not available.

Conclusions

The functional somatic syndromes cause great suffering, distress, and disability and have substantial societal costs. The public, therefore, needs 1) to be cautioned about prematurely concluding that symptoms indicate serious disease, 2) to become more cognizant of the ubiquity of benign symptoms and self-limited conditions, and 3) to appreciate the influence of psychosocial factors on the experience of illness. Research into the functional somatic syndromes must continue, but the search for biological and physical causes of symptoms should be accompanied by study of psychological and sociocultural factors. Finally, the media must offer the public a less sensational, more accurate, and more sophisticated model of the functional somatic syndromes— one that encompasses both biomedical and psychosocial factors. Such a comprehensive, biopsychosocial approach to functional somatic syndromes by the medical profession, the public, and the media should permit us to better understand and more effectively treat these conditions.

Requests for Reprints: Arthur J. Barsky, MD, Division of Psychiatry, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115.

Current Author Addresses: Drs. Barsky and Borus: Division of Psychiatry, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115.

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