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CHAPTER 12

Hypervigilance effects in fibromyalgia: pain experience and pain perception

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By all measures, fibromyalgia appears to be a disorder which patients report to be extremely painful, and fibromyalgia patients are under considerable psychological stress. This chapter will examine data from studies of clinical pain assessment, psychophysical studies of pain responsiveness conducted in the laboratory, and investigations of personality and response style characteristics. It will suggest that fibromyalgia involves a generalized pattern of hyper-responsiveness to internal and external discomfort, and that pain reports are the primary but not exclusive manifestation of this perceptual style.

Clinical pain assessment

Numerical scales and visual analogue scales

Conceptually, the simplest approach to the assessment of fibromyalgia pain is through the use of numerical or visual analogue scales. The patient is asked a question such as, "On a scale of 0 to 100, how intense is your current pain?" or "On this 10 cm line extending from 'No pain at all' to 'Pain as intense as I can imagine it', place a mark at the point representing your current level of pain". Patients may interpret such instructions differently or use numbers or lines in idiosyncratic ways (Ohnhaus and Adler, 1975; Carlsson, 1983; Murphy et al., 1987), but there is considerable evidence that such scales can assess one or more dimensions of the pain experience (Price et al., 1983; Duncan et al., 1989).

Leavitt et al. (1986) had fibromyalgia and rheumatoid arthritis (RA) patients describe their average pain on a scale of 0 to 100. The scores were both high and similar: 60.8 for the first group and 58.7 for the second.

Nolli et al. (1988) used a visual analogue scale to assess the pain levels of 33 fibromyalgia patients, 24 suffering from RA, and 50 patients affected by osteoarthritis (OA). Here, also, the fibromyalgia and RA groups registered similar pain scores (6.97 and 6.7 out of 10, respectively) and both scores were significantly higher than those of the OA patients (4.98).

Perry et al. (1988) also compared fibromyalgia and arthritis patients, but their subjects described their pain as being more moderate. Using a 10 cm visual analogue scale for present pain, they found that fibromyalgia patients rated their pain as 4.5, compared to 3.1 for arthritis sufferers. Gaston-Johansson et al. (1985) tested similar populations; their fibromyalgia patients rated their usual pain at 5.4, a value significantly higher than the 3.2 described by a similarly aged RA group. Scudds et

al. (1987) found a mean visual analogue scale value for present pain level to be about 3.0 out of 10 for 20 fibromyalgia patients.

Perry et al. (1988) also used another pain measure, the Present Pain Intensity (PPI) scale of the McGill Pain Questionnaire (Melzack, 1975), where 1 is 'mild' pain, 2 is 'discomforting', 3 is 'distressing', 4 is 'horrible', and 5 is 'excruciating'. Fibromyalgia patients had a score of 2.1 on this scale, while the arthritics' score was 1.8. Curiously, while the VAS and PPI had a correlation of 0.76 for the 19 arthritis patients, it was low and non-significant (0.21) for the 17 patients in the fibromyalgia group. Perry et al. suggest that patients who lack an 'explicable organic basis' and 'demonstrable pathology' may be inconsistent in their use of these pain scales.

The substantial variability in pain levels for the fibromyalgia groups is noteworthy. Age does not account for it, since the patients studied by all of the above groups were, on average, between 43 and 50 years old and had suffered from their disorder for about 4 to 7 years.

It may well be that different centres attract somewhat different populations of fibromyalgia patients. Others may differ in allowing patients to take their usual analgesics during the period just prior to participation in the study. The diverse values may also represent sampling variability: a more recent sample of 20 fibromyalgia patients drawn from the same clinic studied by Scudds et al. found mean VAS scores of 4.3 compared to 3.0 in the former study. The range of scores, which extended from 0.8 to 10.0, was particularly striking (McDermid and Rollman, unpublished data).

More care needs to be given to the instructions presented to patients. If some describe their 'present pain', others their 'usual pain', and yet others their 'worst pain', potentially misleading results will emerge. Emphasis on 'typical' or 'usual' pain should reduce variability. This matter is particularly important when comparing pain levels for different disease entities which may differ considerably in the amount of day to day fluctuation.

McGill Pain Questionnaire

Another approach to pain assessment has been the use of verbal descriptors, particularly the McGill Pain Questionnaire (MPQ) (Melzack, 1975). The McGill Pain Questionnaire consists of 78 adjectives placed in 20 categories (e.g., dull, sore, hurting, aching, heavy). Patients are asked to select which adjective in each group, if any, best describes their current pain. If they pick the lowest ranked word they receive one point on the Pain Rating Index (PRI); if they pick the next highest ranked one they receive two points, etc. The maximum score on the full MPQ is 78.

Scudds et al. (1989a) used this instrument in a double-blind crossover study of amitriptyline and placebo in a group of 36 patients who met the criteria for fibrositis proposed by Smythe and Moldofsky (1977). Four of the subscales, which fall into the 'mixed' category, were omitted, so that a maximum score of 61 was possible. Patients gave a PRI of about 14. This declined to about 9 after amitriptyline treatment.

Perry et al. (1988), using the full MPQ, obtained a considerably higher value. Their fibromyalgia patients reported an overall PRI of 25.5. These values are close to those which Melzack (1984) presented for disorders such as phantom limb, cancer, and back pain .

The MPQ makes it possible to obtain scores on three classes of subscales: sensory, affective, and evaluative. Words such as 'burning' contribute to the first category, 'fearful' to the second, and 'miserable' to the third.

Comparisons among the three subscales are difficult because of the unequal number of words (and thus the maximum possible score) in each. Nonetheless, it is noteworthy that Perry et al. found that the PRI was considerably higher for their 17 primary fibromyalgia patients (25.5) than for the 19 mixed arthritis patients (19.2) and, particularly, that the significant difference occurred in the sensory terms.

Again, somewhat different conclusions about the

level of pain have come from the Italian study conducted by Nolli et al. (1988), which utilized a translated version of the MPQ. Their PRI total was 37.4 for the fibromyalgia group, 34.6 for RAs, and 20.8 for OA patients. The sensory, affective, and evaluative scores were essentially equal for the fibromyalgia and RA patients and, in all cases, greater than for the osteoarthritis group.

It is difficult to know how to interpret the extremely high PRI score reported by the fibromyalgia group in this study. Clearly, these patients found their discomfort to be severe. On the evaluative scale, they reported the pain to be 'intense' or 'unbearable', while those in Perry et al.'s (1988) study described it as only somewhat greater than 'troublesome'.

The sensory component of fibromyalgia was, again, particularly high in the Nolli et al. study, partially because they included three of the MPQ's 'mixed' subscales in with the sensory measure. More than a third of the patients used such sensory terms as 'tender', 'aching', 'tingling', 'cold', 'hot', 'stinging', 'gnawing', and 'jumping'. Likewise, the affective terms commonly employed were 'exhausting', 'sickening', 'punishing', 'wretched', 'tiring', 'agonizing', and 'fearful'. Fibromyalgia patients, these data suggest, are not a happy lot.

The MPQ data obtained by Leavitt et al. (1986) and by Gaston-Johansson et al. (1985) provided corroboration for these findings. They also compared fibromyalgia and RA patients, they also found that fibromyalgia patients had high PRI scores, they also found that there were significant differences between the two groups in the usage of pain terms. Leavitt et al. permitted patients to select all the words which applied to their situation rather than restricting them to one per category. Some fibromyalgia patients picked as many as 43 words. The mean was 18.9, compared to 14.4 for rheumatoid arthritis sufferers. More than 40% of the fibromyalgia group used sensory terms such as 'throbbing', 'sore', 'hurting', 'shooting', and 'aching'.

Curiously, with the exception of 'aching', the lists derived by Leavitt et al. and Nolli et al. are quite different in specifics, although they agree that fibromyalgia patients pick many terms. They correspond more closely on affective and evaluative terms such as 'exhausting', 'nagging', and 'unbearable'.

Two main points emerge from this analysis of verbal descriptor reports. First, fibromyalgia is reported to be a moderately to severely painful disorder, with strong sensory and affective components. Secondly, individuals suffering from fibromyalgia are inclined to use a large number of terms, which differ substantially in quality and severity, to describe their discomfort.

Body maps

Leavitt et al. (1986) presented patients with a pain location sheet and asked them to check all areas of the body in which they were currently feeling pain. Not surprisingly, the most common sites selected by RA patients were related to the joints: fingers, hand, wrist, shoulder, knee, ankle, foot, and toes. Fibromyalgia patients listed a similar number of sites (12.9 versus 11.9 for RA patients), but they were predominantly non-articular ones: lower back, shoulder – upper back, left leg, right leg, neck, and hips. There were 25 sites on the list. At 21 of these, 40% or more of the fibromyalgia patients reported pain. Only the abdomen, chest, genitals, and face were spared.

Nolli et al. (1988) asked their patients to draw a body map of their painful areas and to score each on a 0 ('none') to 4 ('tremendous') scale. Fibromyalgia patients reported 11.5 painful sites, compared to 11.3 for rheumatoid patients and 4.8 for those with osteoarthritis. The average pain score at each site was close to 3 for the first two groups and 2 for the osteoarthritis patients.

Perry et al. (1988) also examined the number of body sites described as painful for fibromyalgia and RA groups. Their data showed a marked difference between these two populations, with 14.5 sites selected by the patients with fibromyalgia and 9.3 by the arthritis sufferers.

Body maps should receive greater use in the as-

sessment of fibromyalgia pain. Lautenschläger et al. (1991) asked patients to look at front and rear depictions of a body, with 13 common fibromyalgia regions identified specifically on the former and 8 on the latter. Patients were asked to score each area on a scale extending from 0 ('no pain') to 5 ('intolerable pain'). Visual analogue scales for 'overall pain' correlated only moderately with the sum of the body map pain scores, suggesting that patients have difficulty in integrating across body regions, that some areas are more salient in arriving at pain ratings, or that pains other than those on the body map, for example, headaches or gastrointestinal pain, were also present.

If patients providing body maps are asked to note whether there are other painful regions, concomitant pain problems can also be assessed. Such information can separate pain due to fibromyalgia from other pains, a distinction which is not made when only a global pain measure is obtained. Finally, such body maps permit an examination of asymmetry in pain complaints which may have considerable diagnostic utility.

Personality and response style considerations

Hypochondriasis and fibromyalgia

The data presented above reinforce the concept of fibromyalgia as a widespread pain disturbance. It is experienced over much of the body, it involves many qualities of sensation and emotion, and it is intense and dramatic.

It has been proposed that such patterns of response are associated, possibly in a causal manner, with a psychological disturbance. Numerous investigators (e.g., Payne et al., 1982; Ahles et al., 1984; Wolfe et al., 1984) have found that a substantial proportion of fibromyalgia patients display elevations in several scales of the Minnesota Multiphasic Personality Inventory (MMPI).

The MMPI, however, was developed for the assessment of psychopathology in the general population. Recent critiques (Smythe, 1984; Merskey et al., 1985) have noted that individuals suffering from a painful disorder will almost inevitably score high on such scales as hypochondriasis, depression, and hysteria, because of the nature of the questions rather than because of underlying psychopathology. Leavitt and Katz (1989), however, noted that differences in personality test performance between fibromyalgia and RA patients cannot be explained on the basis of pain intensity.

Scudds et al. (1987) studied personality variables in fibromyalgia and RA patients using the Basic Personality Inventory (BPI), an instrument with considerably better psychometric properties than the MMPI. Even after removal of items which might be included among the symptomatic features for fibromyalgia (e.g., presence of aches and pains, bodily discomfort), fibromyalgia patients showed elevations on a number of scales, in particular the scale for hypochondriasis.

The data are interesting, but they can also be misleading. They should not be taken as a demonstration that fibromyalgia is either due to, or the cause of, a personality disturbance. As Scudds et al. (1987) noted, the elevations on the hypochondriasis scale may merely indicate the presence of a disease process. Elevations on the anxiety and depression scales could also reflect simply the experience of and concern about physical symptoms. Yunus et al. (1991) did not find any meaningful correlations between the main features of typical fibromyalgia pain and MMPI scales. The hypochondriasis scale was not a useful predictor of pain severity or the number of pain sites and tender points.

Hypochondriasis is both an elusive and a fascinating topic. Labelling a patient as hypochondriacal is generally pejorative, and has often been done in the case of fibromyalgia. A typical definition states that it reflects "a morbid concern about one's health, especially when accompanied by delusions of physical disease". A label of 'fibromyalgia' or 'fibrositis' is often no less pejorative. Achterberg-Lawlis (1988) describes it as "an insidious, pervasive disorder that may be more responsible than any other for the complaining, chronic image of women in the health system".

Even clearly organic pain could, wrongly, be labelled as 'hypochondriacal' if personality test profiles alone are used. Schnurr et al. (1990) administered the BPI to 206 patients with temporomandibular joint pain and dysfunction (TMJPD), 79 patients with acute organic pain seen in a physiotherapy clinic, and 71 normal controls. Those suffering from myogenic facial pain had a hypochondriasis score of 8.0, while the fibromyalgia group which Scudds et al. (1987) studied, scored 10.3. Healthy controls scored 3.2. The pain control group, afflicted with knee and shoulder injuries, back pain, sprains, and the like, had hypochondriasis scores of 7.3. To be sure, this value is lower than that found in the fibromyalgia patients, but not markedly so. Athletic injuries are not due to hypochondriasis, nor are they necessarily a cause of it. Equally, the personality inventory data cannot be taken as evidence that fibromyalgia is due to or causes psychopathology.

Those studies which have looked at the prevalence of psychiatric diagnoses in fibromyalgia patients have generally agreed that depression and somatization disorder are the most likely diagnoses (Kirmayer et al., 1988; Ahles et al., 1991). Even here, however, only a minority of patients would receive such classifications. Hypochondriasis, as a diagnosis, is rarely applied to fibromyalgia.

There are two traditional perspectives on the use of terms such as hypochondriasis: as a personality trait and as a diagnostic category. Neither of these appears to be useful in the case of fibromyalgia. Barsky and Klerman (1983) provided an analysis of hypochondriasis which indicates that the construct may be seen in widely different ways, one of which is as a perceptual amplification of bodily sensations, with possible cognitive misinterpretation. This perspective seems most probable in the case of fibromyalgia and, given the multiple meanings of the term, it is desirable to use a word other than 'hypochondriasis' to describe such a perceptual-cognitive pattern of response. 'Hypervigilance' will be proposed later as a more appropriate descriptor.

According to Barsky and Klerman, patients labelled as hypochondriacs may be augmentors and amplifiers who magnify normal bodily sensations. Their heightened attention to body and physical processes and to emotional states may cause them to experience internal events as being more noxious and intense than normal subjects.

Pain patients are already more likely to closely monitor their bodily functions, particularly those which are pain-relevant. Consequently, what appears to be hypochondriasis is more properly an example of augmentation, amplification, and the labelling of sensations such as tightness or pressure as pain.

Robbins and Kirmayer (1990) considered that fibromyalgia patients have an "amplifying somatic style involving heightened body awareness" and that they "may experience musculoskeletal sensations as more noxious, intense and disabling because of an unusually heightened awareness of bodily functioning".

Hypervigilance and fibromyalgia

Rollman (1979) presented laboratory data which indicated that pain judgments are relative rather than absolute. The perceived intensity of noxious stimuli depended on the other stimuli presented in the same session. Such contextual effects were reminiscent of perceptual studies performed with other forms of stimulation under the general heading of 'adaptation-level' effects (Helson, 1964). Rollman suggested that an adaptation-level effect exists in pain perception, that pain patients may utilize internal levels of discomfort as reference points or anchors in judging new pains, and that pain patients may have higher pain thresholds and tolerance thresholds than control subjects because otherwise noxious stimuli may seem moderate in comparison to endogenous pain (Rollman, 1983, 1989, 1991, 1992).

Chapman (1978) expressed an alternative viewpoint. He noted that numerous pain disorders are accompanied by a heightened degree of responsiveness to both clinical and experimentally-induced pain which he described as 'hypervigilance'. Such patients should show lower pain threshold and toler-

ance levels than control subjects.

While the two perspectives are contradictory, they may each be applicable to different populations (Rollman, 1983; Naliboff and Cohen, 1989). Rollman (1983) noted that adaptation-level effects (elevated pain thresholds and tolerance values) are often seen in some disorders, such as peripheral neuropathy (Nyquist and Eriksson, 1981) and low back pain (Naliboff et al., 1981). Hypervigilance effects are sometimes seen in patients whose pain complaints are of unknown etiology, such as temporomandibular joint dysfunction (Malow et al., 1980; Malow and Olson, 1981), or in those where close monitoring of internal pain states is adaptive, for example, angina pectoris (Procacci et al., 1976). The findings of Merskey and Evans (1975) suggest a distinction between clearly organically-related pains, which are more likely to cause adaptation-level effects, and pains of psychological origin, which seem to be associated with hypervigilance.

Given that the hypervigilance model covers patients who have an enhanced focus on painful sensations, the material presented above suggests that it may well apply to fibromyalgia. Several recent studies have tested the experimental pain sensitivity of fibromyalgia patients and these will be reviewed below.

Hyper-responsiveness to experimental pain

It is worth noting first that fibromyalgia (and myofascial pain) holds special status in the pantheon of pain disorders. In pain research, a distinction is often made between clinical and laboratory studies. The former deal with endogenous pain, present within the individual. The latter deal with induced pain, produced by mechanical, thermal, electrical, or chemical stimulation. In the case of fibromyalgia, although severe spontaneous pain exists, as the visual analogue scale, McGill Pain Questionnaire, and body map studies have demonstrated, the formal diagnosis requires that pain can be induced by the application of mechanical pressure at a requisite number of sites (tender points).

In most instances, palpation of constant pressure is applied with a 'calibrated thumb' and verbal reports or facial expressions signify whether various spots are tender. In other cases, more precise information is obtained by the use of a variable pressure dolorimeter, so that pain thresholds can be established at each site. Fibromyalgia pain assessment provides an elegant example of the use of experimentally-induced pain within a clinical setting (Rollman, 1989).

Scudds et al. (1987) assessed pain thresholds and tolerances for three forms of noxious stimulation: a variable pressure dolorimeter which applied pressure to the forearm at a spot which was not a fibromyalgia tender point, a different device which applied constant pressure, increasing in subjective intensity over time, to a point on the wrist, and constant current electrical stimulation to the hand. The subjects were 20 out-patient fibromyalgia sufferers, age- and sex-matched RA patients, and non-pain controls.

For both constant pressure and electrical stimulation, the fibromyalgia group had the lowest thresholds and tolerance, but the differences were not significant due to large within group variances. For the variable pressure dolorimeter, the pain threshold and tolerance values of the fibromyalgia patients were significantly less than those for the normal subjects. The RA patients data lay intermediate between the other two groups.

Tunks et al. (1988) found comparable results in a study comparing pressure pain thresholds for fibromyalgia patients and controls at five pairs of tender points and five pairs of non-tender points. Not surprisingly, both groups had lower thresholds at the tender points. More relevantly, fibromyalgia patients had dramatically lower thresholds than controls at both sets of sites.

Lautenschläger et al. (1988), who investigated 45 patients and 34 pain-free controls, also found consistently lower pain thresholds, both at tender ($n = 28$) and control points ($n = 4$). Their finding of substantial group differences at control points was similar to the data Tunks and his colleagues obtained, even though Lautenschläger et al. used different control sites.

Campbell et al. (1983) found no differences for

pressure pain threshold at non-tender points when they compared patients with fibromyalgia with a comparison group. The latter, however, was drawn from a medical centre and many had moderate to severe musculoskeletal complaints and fatigue.

The 1990 criteria for fibromyalgia proposed by the American College of Rheumatology (ACR) (Wolfe et al., 1990) followed a multicentre study of 293 fibromyalgia patients and 265 control patients with a variety of chronic pain syndromes. Pressure dolorimetry was performed at 6 'active' sites and 3 'control' sites; fibromyalgia patients were significantly more responsive at both sets of points.

Tunks et al. (1991) also obtained similar results. Fibromyalgia patients had significantly lower dolorimetry thresholds than normal controls at traditional fibromyalgia tender points, myofascial trigger points, and control points. Interestingly, the myofascial pain patients also exhibited hyperresponsiveness, although not nearly to the extent demonstrated in the fibromyalgia group. Scudds et al. (1989b) replicated this finding of generally increased pain sensitivity in fibromyalgia patients compared to other chronic pain groups. They found lower pressure pain thresholds at 8 tender points as well as at 4 control points in 'fibrositis' patients than in patients with a myofascial pain syndrome.

Berntzen et al. (1990) presented a comparison of pain tolerance in fibromyalgia patients and patients with major depression, using an adapted form of the submaximum effort tourniquet technique. The pain patients had the lower thresholds. As patients with depression are often less sensitive to experimental pain than healthy persons, this finding requires replication with normal controls.

It remains to be established why certain points on the body are more tender than others. Certainly, it is not the case that tender points are unique to fibromyalgia. Several investigators (Lautenschläger et al., 1988; Tunks et al., 1988; Mau and Raspe, 1990) have found that these sites are particularly tender even in pain-free individuals. In the ACR criteria study (Wolfe et al., 1990), for the control patients the pressure pain threshold was nearly 1 kg lower at the 'active' loci than at the 'control' ones. To be sure, the difference was even larger (1.7 kg) for the fibromyalgia group.

Fibromyalgia patients are consistent in their pattern of response at tender and control points, as are other pain patients and pain-free persons. Quimby et al. (1988) obtained reasonably high correlations between the pain thresholds assessed at the two sets of points, a finding recently replicated in a study by Smythe et al. (1992). Hence, there appears to be a strong relationship between general pain responsiveness and the tenderness of specific sites.

It seems likely that the low pain thresholds seen in fibromyalgia patents are not limited to pain-induction techniques which apply pressure to the muscles. As noted above, Scudds et al. (1987) found similar results with trains of electrical pulses, but the differences were not quite significant because of large variability. Replication with electrical stimulation and extension with thermal stimulation are needed.

Low pain thresholds are not an inevitable correlate of rheumatic disorders. Gerecz-Simon et al. (1989) found that patients with ankylosing spondylitis, tested with a pressure algometer at six sites on each side of the body which were not fibromyalgia tender points, had pain thresholds which were significantly higher than those of osteoarthritis patients. The latter, in turn, had values significantly higher than those of normal controls. As in other studies cited above, RA patients had pain thresholds which were significantly lower than those of the controls. Thus, depending upon the disease, effects of both hypo- and hyper-responsiveness were obtained.

Generalized hypervigilance model

The constellation of increased clinical pain responses, heightened reactivity to experimental pain, and elevations on certain personality test scales assessing hypochondriasis suggest that fibromyalgia patients may have a hypervigilance reaction which is not specific to muscle pains at tender points. Smythe (1986) referred to this pattern of 'exquisite hypersensitivity' as the 'irritable everything syndrome'.

Recently, McDermid and Rollman (unpublished data) extended quantitative testing of these patients to another sensory domain, audition. Earlier studies (Gerster and Hadj-Djilani, 1984; Hadj-Djilani and Gerster, 1984) had suggested that fibromyalgia sufferers experienced alterations in auditory mechanisms. McDermid and Rollman found that patients had a noise tolerance threshold nearly 35 dB lower than that of control subjects.

What seems critical in understanding fibromyalgia is why events which have transient effects in most individuals lead to a chronic disability in others. The generalized hypervigilance hypothesis suggests that fibromyalgia patients are more aware of all perceptual experiences with an aversive tone, and pain just happens to be the primary one to which attention is directed. Hypervigilance reflects a perceptual style in which aversive events are amplified or in which the usual cognitive filtering mechanisms, which dampen the response to aversive events, are not fully engaged. In contrast to the conceptualization of a 'hypochondriacal reaction' (Kellner, 1992), which is viewed as an erroneous and exaggerated appraisal of bodily experiences, hypervigilance is thought to be a perceptual habit.

Fibromyalgia is often perceived to arise following a major physical or psychological disturbance (Gaston-Johansson et al., 1985). It seems likely that hypervigilance is a predisposing rather than a precipitating factor which is manifested after highly stressful events and gives rise to subjective pain reports, intensified pain behaviours, and increased reactivity to external stimulation.

The role of genetic factors and early experiences in generating these response patterns remains to be established. Relatively moderate pains arising from muscular hypertonia or hyperactivity (Graber, 1991) may become amplified, leading to the constellation of fibromyalgia symptoms. Anxiety about the puzzling and troublesome disorder (Pennebaker, 1982) may lead, secondarily, to increased physical preoccupation, increased body awareness, and increased muscle tension. The disorder then becomes self-perpetuating.

According to these assumptions about hypervigilance, management approaches which repeatedly confront the patient with aversive stimuli after the acquisition of appropriate coping skills appear especially promising because they directly aim at a change of the hypervigilant response style. Potentially useful techniques have already been developed under the heading of 'stress' or 'pain inoculation' (Turner and Romano, 1990). It is worth noting that Philips and Jahanshahi (1985) found that the noise discomfort threshold for migraine sufferers was appreciably greater among those who had been exposed to such noise, particularly under relaxation conditions, than for those who had not had such exposure. Their findings suggest that exposure of fibromyalgia patients to aversive stimuli, in a manner which heightens their self-efficacy and perceived control (Dolce, 1987; Litt, 1988), may lead to an adjustment of their response criterion, resulting in an elevation in threshold or tolerance. Of particular interest is whether such laboratory induced changes can generalize to the day-to-day situation, leading to a decrease in the perceived level of clinical pain.

The conceptualization of fibromyalgia as a hypervigilant response style is not the only possible one. An alternative view could be that fibromyalgia is a physiological disturbance. Such a position is not incompatible with the notion of a perceptual disturbance. Yunus (1992b) has suggested that fibromyalgia, along with a host of other painful syndromes which often accompany it, reflects an "aberration of normal central mechanisms of pain". He suggests that the abnormality could arise from a deficiency of the inhibitory system, an accentuation of the facilitatory system, or both, but stresses that the locus of the mechanism that "amplifies the pain perception" (Yunus, 1992a) must be central. The primary causes are proposed to be dysfunctions of neurotransmitters, such as serotonin, norepinephrine, and substance P.

Our considerations suggest that fibromyalgia is not a psychiatric disturbance. Rather, fibromyalgia reflects an altered perceptual style. It seems likely that there is a reduction in response criterion when perceiving aversive events (Rollman, 1977). Of course, these assumptions will not apply to all pa-

tients diagnosed as having fibromyalgia. Fibromyalgia will be better understood through the combined use of clinical and experimental pain assessment, coupled with evaluation of perceptual and cognitive processes. Perceptual and cognitive factors, rather than personality traits, define the symptoms of the disorder and will likely help define the treatments.

Summary

Visual analogue scales, verbal descriptors, and body maps indicate that fibromylagia is characterized by intense endogenous pain spread over numerous body sites. Fibromyalgia patients are also reported to have significant elevations on numerous personality dimensions, such as hypochondriasis. It is better to view such behaviors as reflecting perceptual, rather than personality, factors. The heightened response to experimentally-induced pain seen in individuals with fibromyalgia indicates that they have an altered response style, 'hypervigilance', which involves a perceptual amplification of both internal and external aversive events.

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