

## VARIATIONS IN THE PAIN REACTIONS OF HOSPITAL PATIENTS

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*The tenability of an exclusively "medical model" explanation of pain is called into question. The pain experience is a "mediated" one; the brain regulates the pain experience through its electrochemical activities and attentiveness to pain stimuli. The latter is largely the result of conditioning processes, many of which are related to ethno-cultural attitudes. Zborowski found differential pain responses among American patients of Yankee, Italian and Jewish ancestry. Sternbach and Tursky discovered differing reactions to electric shock among American housewives of Yankee, Irish, Italian and Jewish ancestry. Chapman and Jones studied the pain responses of American negroes, and Caucasian Americans of Northern European, Italian, and Russian Jewish ancestry and concluded that differences in pain sensitivity and reaction exist which are related to ethno-cultural origins. These ethno-cultural differences are discussed and some speculative explanations are offered. The implications of these observations for hospital staff, particularly nurses, are examined and some specific remedies for related problems are presented.*

*"The rain of pain falls mainly in the brain"*  
Seattle newspaper headline

It is believed that some of the failures of traditional treatment approaches to the amelioration of pain are the result of a reliance on a much too limited conceptual model of pain; that is, the "medical model" (Fowler *et al.*, 1969; Fordyce *et al.*, 1973; Cousins, 1979). This disease model sees pain as a symptom reflecting some internal, antecedent pathogenic element. Emotional factors, included under such rubrics as "conversion reaction" or "psychogenic pain", assume etiological significance by default; they are considered only if and after a thorough diagnosis fails to reveal a somatic, pathologic cause involving either the tissue or the psyche. A new technique, "thermography", may obviate some of the prevailing diagnostic imprecision (Barnard, 1981).

Disagreeing with the medical-disease model of pain, Sternback (1968:5) states.

In order to describe pain, it is necessary to conceive of it as a set of responses . . . a person must do something . . . in order for us to determine that he is experiencing pain.

Stated another way, a person must exhibit pain behaviors before we infer pain. Lasagna (1960) has observed that any pain investigator is dependent, of necessity, upon the willingness of the patient to communicate his/her

experience from the display of recognizable pain behaviors. However, this approach is flawed as Beecher (1960:91-2) points out:

Many investigators seem grimly determined to establish . . . that for a given stimulus there must be a given response; that is, for so much stimulation of nerve endings, so much pain will be experienced, and so on. This fundamental error has led to enormous waste . . . there is no simple relationship between stimulus and subjective response . . . the reason for this is the interposition . . . of the processing component, conditioning of the psychic reaction.

Conn (1981), reporting on his interview with Dr Steven Brena, Director of Emory University's Pain Rehabilitation clinic in Atlanta, Georgia, notes:

The sensation of pain is a product of the painful stimulation and modifications made by the central nervous system . . . the modulation system seems to be a function of what we've learned . . . a computer that ordinarily regulates itself and is programmed by past experience, training and upbringing . . . the computer is regulated by the release of certain substances, natural narcotics . . . trouble occurs if those substances begin to run out. If you let the emotions run wild producing stress, you can use up their (the natural opiates') ability to modulate and get a reaction to pain out of proportion to the stimulus.

As both Beecher and Conn assert, the pain response is a "mediated" one; it is not merely a given response to a given stimulus but a psycho-physiological event. Pert (1981) reported on a series of experiments conducted at the United States National Institute of Mental Health which identified the circumstances in which the brain, responding to painful stimuli, produced a natural analgesic state by activating brain endorphins, natural opiates. In one of the reported studies, two groups of white rats were placed in chambers with electrified grid floors. One group received electric shocks through the grid at 7-second intervals for a 10-minute time span. The other group received no shocks. Then both groups were tested as to their sensitivity to pain. It was found that the "shocked" group had a greater tolerance for pain. Immediate examination of the brain and spinal tissues revealed lower than usual endorphin levels in those areas of the shocked rats' brains in which pain is registered (for example, the hypothalamus, the thalamus, and the periaqueductal gray matter). It was concluded that the "mediating" brain releases and "burns" endorphins in response to pain and, as a consequence, there is a lower post-pain level of endorphins in those areas which have been "burning" them to dull pain sensitivity.

Other brain chemicals also influence one's response to pain. For example, serotonin is a brain neurotransmitter which, if present at higher levels, moderates the sensitivity to pain. While most neurotransmitter levels are apparently not influenced by food nutrients, serotonin levels appear to be increased by eating the amino acid tryptophan. Tryptophan is most readily found in protein foods but, ironically, eating protein foods is not the best way to increase brain serotonin levels. Protein foods contain not only high levels of tryptophan but also of other amino acids which outrace tryptophan to the entry points in the brain's capillaries and block them, thereby precluding tryptophan's absorption and subsequent conversion into serotonin. However, a high-carbohydrate, low protein meal stimulates the release of insulin which removes the competing amino acids from the blood before they can get to the brain and permits tryptophan to reach the brain for conversion to serotonin. Therefore, the meal just described, by increasing brain serotonin levels, enables the "mediating" brain to moderate the pain experience (Wurtman, 1978).

Pain sensitivity may come under the influence of events in the social, as well as biological, environment. Social learning also has an impact on the brain's mediating process. In this regard, Fordyce and his colleagues (1973:400) found that:

The behaviors making up most of the manifestations of pain . . . may be elicited by antecedent stimuli; for example, by noxious stimuli or

pathogenic changes in tissue. However, those very same operants making up pain behavior may come under the control of consequences. They may come to occur only because they are followed systematically by positive consequences.

The Fordyce group developed a treatment approach for chronic pain patients which in no way modified the body tissues or emotional pathology assuming that, if the patient's pain response or behavior could be altered by the treatment program, the validity of the medical-disease model of pain as its sole explanation would be untenable. Their program resulted in a significant decrease in the need for daily medication and a significant increase in the display of "well behaviors". The program involved 36 patients. Fowler and his colleagues (1969) successfully applied a similar approach in treating three chronically ill patients. While one needs to be cautious about extrapolating too broadly from these two studies because of the limited size of the research groups treated, they do give reason to question an exclusively medical model of pain.

Those people who exhibit little or no visible reaction, vocal or otherwise, when they are obviously hurt are said to have "a high threshold for pain"; those who do not even try to suppress their reactions are seen as having "a low threshold". Since there exists no physiological evidence of differences in pain sensors in reasonably healthy people, the differential reactions are apparently due to emotional factors. Certain cosmological views would seem to accommodate and/or reduce the experience of pain. These differing pain reactions appear to be tied to ethno-cultural attitudes. In discussing the investigations of the pain groups of the Department of Medicine at the New York University Medical Center, Wolff and Langley (1968:3.14) note that:

An impressive fact, emerging from investigations involving a large number of healthy individuals and patients with arthritis has been the difference in pain response due to ethnocultural factors.

Zborowski (1952) found dramatic differences in response to pain according to whether the subject was of "Old American" ("Yankee"), Jewish or Italian ethnicity. From an original group of 103 American subjects - 87 hospitalized patients and 16 healthy friends or relatives - Zborowski compared the differential pain reactions of 81 - 26 "old Americans", 31 Jews, and 24 Italians. He found that the present-oriented Italians tended to call for immediate relief from pain by drugs or other means and were happy when the pain was alleviated. The Jewish patients, whom he found to be future-oriented, also sought relief from pain, but remained suspicious of its future implications and therefore tended to continue complaining even after the pain had been reduced or eliminated. The "Old Americans", who were found to be future-oriented like the Jews, tended to be optimistic about the future and sought solitude when in pain. Both the Jewish and Italian patients sought the company of others when in pain.

Opler (1961) speculating on the meaning of Zborowski's findings, opined that the low threshold for pain in Italian patients might be due, at least partially, to that group's general preoccupation with bodily function and body image, while the relative stoicism of an Irish patient group might have stemmed from its tendency to pride itself on its display of disconcert for the physical self.

Sternbach and Tursky (1965) studied the pain responses to electric shock of 60 housewives - 15 "Yankees" (Protestants of British descent whose parents and grandparents were born in the United States), 15 Irish (Roman Catholics whose parents had immigrated to the United States), 15 Italians (Roman Catholics whose parents had come to the United States from either Sicily or the southern Italian mainland), and 15 Jews (either Orthodox or Conservative religiously whose "roots" were primarily in Eastern Europe). They found differences among the groups in both pain threshold and tolerance, yet these differences reached statistical significance only in terms of pain tolerance: the "Yankee" group had the highest

mean "tolerance score"; the Jews, the next; then the Irish, with the Italian group having the lowest mean "tolerance score". In interpreting their results, Sternbach and Tursky concluded that the differences in both threshold and tolerance were attributable to attitudinal differences. The "Yankees" had a stoical attitude and like the Irish were undemonstrative regarding pain; the Italians' present-time orientation caused them to focus on the immediacy of the pain; while the future orientation of the Jews resulted in their focusing on the implications of the pain.

Chapman (1944) and Chapman and Jones (1944) compared the pain responses of 36 individuals - 18 negroes from the southern United States and 18 Caucasian Americans of northern European ancestry - and found that the negro group had a lower threshold for pain perception. Chapman and Jones (1944) also reported a study of the pain perceptions of 30 other Americans. While the report did not indicate in what proportion, the ancestry of the individuals studied was either Russian Jewish or Italian. It was found that the study group had pain thresholds similar to those reported for American negroes and much lower than those for the American group of northern European ancestry. Yet, while their pain thresholds were similar, the Italians complained loudly when their thresholds were reached, while the negroes quietly endured at the same point. Chapman and Jones concluded that ethnic differences in pain sensitivity and reaction exist.

Admittedly, the reported studies do not definitively establish that there are basic differences in pain tolerance and response based exclusively on ethnic group membership. They do, however, strongly suggest that attitudinal factors, often ethnically inculcated, influence pain thresholds and tolerance. While individual differences and those due to sex, income, race and religion must be taken into account in explaining differential pain perceptions and reactions, it is a mistake not to give proper emphasis to the role of ethnically inculcated attitudes.

Wolff and Langley (1968:314) note that:

The research investigator is more concerned with the physical nature and somatic bases of pain than with the psychosocial and cultural components. The practising physician, on the other hand, tends to be aware of the human pain response: his clinical observations have made him realize that there are ethnic and cultural differences in pain knowledge of the cultural, and psychosocial differences in the human pain response is based on empirical rather than experimental evidence.

Wolff and Langley (1968:314) assert that:

It appears quite clear from the studies . . . that cultural factors in terms of attitudinal variables, whether explicit or implicit, do indeed exert significant influences on pain perception.

Joe (1971) suggested that crucial differences in socialization result in men acting

so as to control emotion-inducing stimuli rather than passively experiencing them. Might not the same be said of different ethnocultural traditions? Some traditions condition their members to become pain-augmenters, while others condition pain-reducers, -controllers, or -deniers. Since the perception of pain is always psychological (in the sense that the experience is mediated by the brain), it is largely a "learned" response. Family child-rearing practices are particularly important. Mechanic (1970) suggested that parents who frequently complain about their health and readily keep their children home from school may focus the child's attention on internal states and teach patterns of internal monitoring that encourage a long-lasting tendency to react to every minor symptom. Additionally, a child who is rewarded with parental attention whenever he/she exhibits pain behaviors will tend to become an adult who still, albeit subconsciously, displays pain behaviors as an attention-seeking strategy. However, because he/she now views the former dynamic as "childish", he/she will subjectively create a pain experience to justify and "legitimize" the pain behaviors. In other words, some people have subconsciously learned to manipulate others and the environment in general

through pain behavior; they get attention, emotional support and often the continuation of pain-assuaging medication.

Physiologically the area of the brain most involved in the experience of pain is the reticular activating system which regulates the flow of information to the brain; it controls "selective attention". Different people are conditioned to be attentive to different stimuli and what they consciously experience is a function of prior learning. Therefore, pain may be experienced differently and those taught to be attentive to pain stimuli and/or behaviors actually create a greater pain experience for themselves. Conversely, pain reducers, because of their diminished attentiveness to those stimuli and related pain behaviors, experience less pain. The nerve cells of the reticular activating system, responding to physiological and psychological factors, can release a special type of endorphin to control pain sensations. Therefore, for the person with the appropriate mental set, actual pain, not just the subjectively created, may be diminished.

What are the implications of these observations regarding pain behavior for the hospital staff, particularly nurses? Zborowski (1952) indicated that in America the hospital staff as a group tended to endorse the "Old American" ("Yankee") posture regarding pain; that is, while pain should be "acknowledged" only minimal emotional reactions should be expressed. Consequently, Zborowski found that in America the hospital staff tended to feel that the Italian and Jewish patients complained excessively and emotionally over-reacted to pain. The staff, therefore, needs to acknowledge and re-examine its position vis-à-vis sanctioned reactions and concede that other, equally "legitimate", ones are possible. What *is*, must be acknowledged and understood, and, if not undesirable, accepted. If a problem is recognized, an institutional program addressing it needs to be inaugurated. If the acceptance of varied response patterns is desirable, a program with informational and affective dimensions should be instituted. If it is deemed that the institutional integrity of the hospital is the primary concern, then the staff should be acquainted with proven techniques which will reinforce the desired response patterns it encounters.

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