Results of treatment of chronic low-back pain at the Portland Pain Center

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We have evaluated 100 consecutive patients with low-back pain admitted to the Portland Pain Center. The average patient had been disabled for about 6 years, and had had an average of two surgical attempts to improve his symptoms. Most of the patients considered had open claims with their Workmen's Compensation carriers. Significant gains were demonstrated in drug reduction, general well behavior, and increased range of motion and exercise tolerance. The Pain Center setting provides a multidisciplinary approach to the treatment of chronic low-back pain. Significant increases in functional capacity are demonstrated.

Key Words □ chronic pain □ low-back pain □ pain clinic □ multidisciplinary therapy

The development of the multidisciplinary clinic is an innovative and an important new approach to the treatment of chronic pain. The Portland Pain Center is a multidisciplinary pain clinic using a non-surgical, eclectic, therapeutic approach consisting of systematic drug withdrawal, operant conditioning, active, as contrasted with passive, physical therapy, body-mechanics classes, biofeedback, relaxation therapy, and educational classes and seminars. Active patient participation is emphasized. The treatment team includes a neurosurgeon, a psychiatrist, two clinical psychologists, physical therapists, and appropriately trained nurses. Twice weekly staffing conferences are used as an integral part of the program. Criteria for admission include physician referral, an expressed willingness by the patient to participate, and the presence of chronic pain. Less than 2% of patients referred are screened out on this basis. Eighty-five percent of the patients admitted complete the program. The occasional patient who would benefit from a surgical approach to his problem is referred to another institution.

Methods

One hundred unselected, consecutively treated patients with chronic low-back pain are the subject of this study, representing about 65% of patients admitted. To maintain objectivity, Pain Center patients are not operated on by members of the staff. Since most patients have been under the care of orthopedists and neurosurgeons, indications for surgery in this group are few. Some of the patients have already had in addition to their lumbar surgery, other procedures for pain relief including sympathectomy, cordotomy, thalamotomy, and dorsal column or peripheral nerve stimulator implantation.

The average duration of inpatient treatment was 21 days (range, 15 to 25 days). Each patient was seen at a follow-up examination approximately 3 months following discharge. No surgical procedures were used in the
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group studied. Most of our patients had sustained injuries while at work and had open claims with their Workmen's Compensation carrier at the time of admission. There was an equal number of men and women. The average patient was 45 years of age, had had two surgical procedures for his pain (range, 2 to 17), and had been disabled for 5.7 years (range, 1 to 25 years). The average patient had a 10th grade education and noted his state of general health as good, with the exception of his chronic pain.

Modalities of Therapy

Operant conditioning has been shown to be of value in helping patients learn to alter behavior patterns which are seen in the chronic-pain patient. The basic principles that are used include:

1. Encouragement and reinforcement of any new behavior that appears to fall in the category of "well behavior" such as increased exercise tolerance, and reduction of analgesic medication and an overall reduction in what is referred to as "pain behavior."

2. Removal of reinforcers for old behavior such as complaining of pain, abnormal gait, and dependency behavior.

3. Reinforcement of behaviors that are incompatible with the old behavior, such as encouraging a patient to walk in the hall, a behavior that is incompatible with lying in bed.

Integration of staff into a multidisciplinary team is felt to be an important part of the behavior modification aspects of the program. Team meetings occur daily. These are complimented by biweekly multidisciplinary staffing conferences where all the treatment modalities are brought together. The patient's progress is monitored and appropriate therapeutic plans are made. This way each member of the team is aware of what a particular patient is doing in each departmental area of the program.

Involvement of the spouse is felt to be an important aspect of the behavior modification program. Regular spouse groups are held during the course of care at the Pain Center. During the last 2 days of care, the spouse is invited to participate fully in the activities. Recommendations are made to the patient and to his family regarding care after leaving the Center. It is pointed out that the spouse should provide the same principles of behavior modification in accenting the positive aspects of the patient's improvement and maintaining the responsibility of the continuation of the program by the suffering person. For example, it is not the responsibility of the spouse to see that the patient exercises, but rather the patient's responsibility. By the same token, the spouse should encourage this type of behavior by overt recognition.

Dealing openly and honestly with the "secondary gains," such as financial compensation, and relief from responsibilities, is felt to be an important part of the program. Problems associated with the Workmen's Compensation claims and disability determination are discussed in detail. In a sense, patients are shown more productive behavioral methods of satisfying their needs as opposed to continued pain behavior.

Exercise Program

Exercises are used as a means of teaching proper body mechanics. The use of flexion exercises in everyday activities is felt to be quite important in reducing the amount of pain the patients report. Applying this on an individual basis to activities that the patient finds difficult to engage in is felt important. No passive physical therapy is offered; all exercising is of an active type.

It is felt that regular exercise is an important part of the rehabilitation of low back pain patients. An analogy exists between the use of appropriate diet as a responsibility of the patient suffering from diabetes mellitus and regular exercise for the chronic-pain patient. Exercises are encouraged at a frequency of three to four times a day. Mobility measurements are taken on a weekly basis with the emphasis on the patient's endurance and exercise tolerance. Healthy competitiveness occurs between patients as they progress.

Biofeedback Therapy

Biofeedback therapy is used three to five times a week. Machines are available on the unit for the patients to use during their free time. The major purpose of biofeedback for the treatment of chronic low-back pain is not so much for back pain relief but rather to teach the patient he can control such important functions as muscular tension in skeletal muscles. Through the use of electromyo-
graphic (EMG) training, patients can learn to voluntarily control splinting of major muscle groups that are often associated with reflex muscle spasm and pain. One major element of biofeedback training is that the patient has the sole "responsibility" for his therapy.

**Relaxation Therapy**

Relaxation therapy, it is felt, can be of value in helping patients to learn to relieve tension and gain control over some of the emotional aspects of pain perception. Jacobson's systematic relaxation techniques are used, as well as other more intense relaxation training for profound muscular relaxation. Learning to relax can be a powerful tool in combating chronic pain. Again, this gives to the patient the responsibility for some aspects of his treatment.

**Education**

Education in the form of didactic lectures occurs daily. Informal discussion groups are helpful in explaining to the patient the continuing mechanisms of chronic pain and why surgical procedures cannot provide the patient with a "new back." In addition, problems dealing with sexuality in the presence of physical disability and helping patients understand how chronic pain does affect a person's personality can help patients deal with some of their problems. Methods of dealing with these problems are also stressed. Counselling about medications of all types is a popular part of the program.

**Results**

**Psychological Components**

A significant psychological component is present in the patient with chronic low-back pain. Diagnosis by psychological interview and appropriate tests, including the MMPI, suggests the presence of hysterical conversion reaction in 70% of the patients, and the presence of emotional or financial secondary gains. Significant depression was demonstrated in 56%, and sociopathic or characterological personality disturbances in 8% (Fig. 1).

**Medications**

Prescription pain medications were being taken by 87% of the patients on admission, 5% at discharge, and 22% at follow-up 3 months after treatment. On admission, 71% were taking narcotic medications, whereas at discharge, four patients were taking narcotics, while only one was still on his non-narcotic analgesic. At follow-up, 8% were on narcotic medication and 8% were taking non-narcotic prescription analgesics. In 20% of the patients, Class A narcotics were used at an average rate of six tablets or injections a day. At follow-up 3 months after discharge, only two patients were taking Class A narcotics at a rate of 2.5 tablets per day.

**Mobility and Exercise Tolerance**

Each of the 100 patients in the study was taught exercises to increase his overall muscle strength and to improve the mobility of the lower extremities and back. Straight-leg raise was taught as an active exercise with no
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assistance by the examiner or therapist. On admission, the active straight-leg raise on the affected side was $57^\circ$, at discharge, $87^\circ$, and at follow-up, $82^\circ$. Sitting with legs straight and raising the knees to the chest is a stressful back exercise and unlike the others discussed here, is not limited by tight hamstrings. On admission, the average patient could elevate the knees to about $72^\circ$, at discharge to $115.5^\circ$, and at follow-up to $120.2^\circ$.

**Need for Further Care**

At follow-up examination, 80% of the patients interviewed indicated that they were no longer seeking medical care for their back problem. Claim closure was recommended in 75% of the patients seen at follow-up, with the patient's agreement. At the time of discharge each patient was out of bed all day and using only an upholstered chair for rest.

**Illustrative Case Reports**

**Case 1**

The patient was a 34-year-old woman with chronic low-back pain. She had had three laminectomies and fusions, L-4 through S-1. Medications on admission included Percodan, 10 to 15 tablets a day, and Valium, 120 mg a day. The patient was at the minimal level of physical activity on admission and was able to do a straight-leg raise to $45^\circ$ on the right, and to $55^\circ$ on the left, after 4 days in the Center. Her knee-to-chest elevation was $100^\circ$ bilaterally in the long-lying position; she was not able to sit up.

At discharge 24 days later, the patient had advanced to the senior level, was able to do a straight-leg raise $80^\circ$ on the right, $95^\circ$ on the left; knee-to-chest elevation was $130^\circ$ bilaterally, and in long sitting to toes she could reach within 6 inches of her toes. On follow-up examination 2 months after discharge, the patient was able to do a straight-leg raise to $95^\circ$ on both sides; she was able with knees extended to reach to within 2 inches of the floor. She had not taken any medication since discharge and her attitude and affect were much improved.

**Case 2**

This patient was a 53-year-old man with a 15-year history of chronic low-back pain and four lumbar fusions, the last being 11 months prior to admission. The patient was taking Empirin Compound No. 3, about 4 to 6 a day. He had spent most of his time lying down, and was active for only about 2 hours a day. The scars of his previous surgery were extremely tender, with marked splitting of the paravertebral muscles. There was severe limitation of forward flexion from a standing position and he crawled up his legs in an effort to straighten into an erect posture.

The patient was systematically withdrawn from his medication during his 25-day course in the Center. He advanced in his ability to perform the straight-leg raise from $25^\circ$ to $60^\circ$ during his course in the Center. After discharge the patient noted progressive improvement with continued exercise. Four months following discharge, the patient was no longer taking medication and there had been further improvement in his endurance. He was "up and around" most of the day spending whatever "down" time he needed in a chair. He returned to work for the first time in over a year. His general outlook and mood were good. At last contact the patient was taking no medication.

**Discussion**

In the patients studied with chronic low-back pain there appears to be a significant psychogenic or functional component present. This is primarily characterized as a hysterical conversion reaction with accompanying depression. Dealing with the emotional and physical components simultaneously is made possible in the Pain Center. The patients demonstrate a reduction in the need for narcotic and non-narcotic analgesics as a function of the treatment. At the time of discharge only 5% of our patients are taking some form of prescription pain medication. There is only a slight increase in the use of these medications on follow-up examination some 3 months later.

There is little control of the patients once they have been discharged from the program. Each is referred back to his attending physician. Even so, the lack of significant recidivism seen over the short follow-up period
supports the fact that patients with chronic low-back pain are capable of showing significant increases in physical mobility, range of motion, and endurance as a function of the treatment.

Further studies are presently in progress to lengthen the follow-up period and to evaluate specific psychological and psychometric changes as a function of the Pain Center experience. The major aspects of the treatment program seem to be important in producing the results demonstrated and can be summarized by the terms, “multidisciplinary and patient responsibility.” Having the patient actively participate in his own behalf by following a program that the therapists and physicians can all observe is the important requirement. The patient in a sense shows his own commitment to his rehabilitation.

On the basis of this sample of 100 patients, a multidisciplinary, non-surgical, team approach to the treatment of chronic low-back pain is effective. This treatment approach is not a panacea; however, the success demonstrated raises important questions regarding the traditional treatment of the chronic low-back pain patient.

References


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