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Psychological Profile and Work Status of a Predominantly Hispanic Worker's Compensation Population With Chronic Limb Pain

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Abstract The purposes of this study were to describe the psychosocial profile and to measure function (posttreatment work status) after surgical and non-surgical treatment in a predominantly Hispanic worker's compensation population with chronic limb pain. We conducted an archival review of records from 91 patients treated for neuropathic pain in a specialty clinic over a 10-year period who had extreme difficulty accepting or managing pain. Medical records from individuals with proven nerve dysfunction experiencing pain >3 months and whose record contained a full psychological evaluation were included. All patients received patient-centered care, a prescription to return to work, periodic pain assessment, and clinical evaluation of sensory and motor function plus pharmacologic pain management. Surgery was determined by the degree of sensory-motor abnormalities in the absence of untreated psychological distress regardless of pain level or worker's compensation status. The majority of patients returned to work after treatment of nerve injury. No differences were noted between surgical/non-surgical treatment groups on initial pain level ($p=0.2$), litigation status ($p>0.5$), and posttreatment work status ($p>0.05$). However, individuals expecting surgery also expected total relief of pain with surgical intervention. Psychosocial assessment, support, and adequate pain treatment seem to mediate the ability of an individual with chronic limb pain to return to work regardless of surgical/non-surgical treatment. Patients' expectations of surgery may be unrealistic and are best addressed prior to treatment.

Keywords Neuropathy · Nerve dysfunction · Limb · Chronic pain · Psychosocial symptoms · Function · Work status · Surgical treatment · Non-surgical treatment · Treatment · Research · Retrospective study

Introduction

Despite a long tradition of ignoring psychosocial aspects of disease in surgical education, researchers are beginning to note the impact of these factors on surgical outcomes. The presence of psychosocial co-morbidities (e.g., depression, smoking, headaches, an active compensation case, or self-rated poor health), influence the rate and extent of postsurgical recovery [13] and negatively affect surgical outcomes in terms of pain and functioning [17]. These compelling findings highlight the need for surgeons and other practitioners to consider psychosocial factors in developing treatment plans and assessing outcomes, especially in difficult-to-treat groups such as patients with limb neuropathies associated with persistent pain [8, 10].

The purposes of this study were to describe the psychosocial profile and to measure function (posttreatment work status) after surgical and non-surgical treatment in a predominantly Hispanic worker's compensation population with chronic limb pain.

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Materials and Methods

We used an exploratory, retrospective research design to extract data from the medical records of patients treated for neuropathic pain over a 10-year period in a specialty clinic. The Institutional Review Board at the University of Texas at El Paso approved this research project.

Setting

The clinic is the private practice of an active member of the American Association of Hand Surgery and the American Society for Surgery of the Hand who also holds certification in pain management by the American Board of Pain Medicine. The surgeon and the majority of clinic staff are multicultural and bilingual (English/Spanish).

From 1995–2005, the surgeon treated hundreds of chronic limb pain patients. All patients received a complete physical evaluation including electro-diagnostic studies. When developing a treatment plan, the surgeon used a patient-centered approach consistent with national guidelines for management of chronic pain (see www.ngc.gov). This plan included psychosocial support (active listening and acknowledgment), pharmacologic therapy for pain and neuralgia, treatment of co-morbidities (e.g., endocrinopathies, sleep disorders, depression, and deconditioning), and a prescription with a plan to return to work early in the rehabilitation process. The surgeon referred all patients who seemed to have extreme difficulty accepting or managing pain to a local psychologist for full psychological evaluation. This group of patients seems to be the hardest to manage in a specialty clinic and, therefore, was the focus of this research.

Sample

For this study, we used convenience sampling and extracted data from medical records of consecutive patients seen over a 10-year period that met inclusion criteria. Only data from medical records that contained the following information were included in the study: (a) evidence of nerve dysfunction (diagnosis confirmed by history, physical examination, electrodiagnostic studies, and imaging), (b) pain lasting for a minimum of 3 months, (c) a detailed psychological evaluation from the psychologist, and (d) a documented follow-up visit with the surgeon after the psychological consultation.

We diagnosed nerve dysfunction clinically and confirmed the extent of damage through sensory and motor evaluation. Sensory evaluation included moving two-point discrimination, Semmes–Weinstein monofilament testing, and vibration or pressure sensitive two-point discrimination. Motor evaluation included voluntary muscle testing, pinch grip and strength measurements, and rapid exchange. Each individual received electromyography and nerve conduction velocities to confirm extent of nerve dysfunction. Diagnoses were coded using the International Classification of Diseases, Ninth Revision.

The same psychologist conducted all evaluations. The reports included a battery of pain and disability assessment tests that changed over time, such as the Behavioral Assessment of Pain Screening Instrument, the Medical Disability Report, and the McGill Pain Questionnaire. Because the only consistently reported findings were the Oswestry Pain Questionnaire, Psychosocial Stressors Severity, Patient Problem Report, and the Global Assessment of Function, this study included only those reports and not the others.

All patients received standard medical treatment for underlying conditions and associated co-morbidities, psychological support, and pain management that included a combination of analgesics, adjuvants, and neuroleptic medications. Surgical procedures included nerve decompressions, reconstruction, neurolysis, and the excision of neuromas. Surgery was determined by severity of sensory-motor abnormalities and progression of objective findings. The presence or severity of pain was not a deciding factor in the selection of surgical candidates. Furthermore, at the time of surgery, candidates had no evidence of uncontrolled depression or other psychological distress.

Data-Collection Methods

We trained a research assistant (RA) to identify medical records that fit the inclusion criteria. Data were extracted from medical records and coded using an Excel™ spreadsheet. Billing records were used to confirm the date of last visit and diagnostic and procedural coding, including surgery performed by the first author. To ensure inter-coder reliability, the second author and the RA confirmed extracted and coded data from medical records three times during and once after the data retrieval period. Data retrieval occurred over a 3-month period (October–December 2006).

Demographic Information

Demographic and other information retrieved from the primary medical records and confirmed by the psychologist report included gender, marital status, education, occupation, work and litigation status, medical diagnosis, and past surgery for a pain-related condition. Information extracted from the psychologist report alone included ethnicity, psychological diagnosis, suicidal ideation, substance use or abuse (tobacco, alcohol, and illicit drugs), and general statements of self-reported family history or prior personal history of psychological problems.

Measures

Measures included a one-dimensional pain scale at initial visit with the surgeon and multidimensional assessment of functioning and pain using the Oswestry Pain Questionnaire, the Psychosocial Stressors Severity, Patient Problem Reports, and the Global Assessment of Function as documented by the psychologist. The outcome measure was posttreatment work status as noted in the medical record at the time of the last follow-up visit.

Pain

Pain was assessed by self-report. A thorough history identified the onset, character, and location of pain, which individuals highlighted on a body diagram. Pain was measured at the time of each clinical visit using an equidistant 0–10 numerical rating scale (from no pain to worst pain possible) on a 100-mm line. The psychologist documented usual, worse, and least pain during the past week using the same 0–10 numerical scale. Measurement of pain using a numerical rating scale (NRS) assumes that pain is one-dimensional and can be captured by measuring intensity. The NRS is useful and common in clinical practice; it “has proven validity and sensitivity, and has been used widely in recent neuropathic pain studies” [9, p. 416].

We recorded the numerical rating for pain from the initial surgeon’s visit and the usual, worse, and least pain rating from the psychologist’s report.

Oswestry Pain Questionnaire

The Oswestry Pain Questionnaire is used as an indicator of how pain affects an individual’s ability to manage everyday life. It is used clinically to assess disability or as an outcome measure in research [12]. It is a ten-item survey that allows individuals to rate overall intensity of pain and impact of pain on personal care, lifting, walking, sitting, standing, sleeping, sex life, social life, and travel. A 0–5 Likert rating scale is presented for each item, with 0 indicating no limitation due to pain and 5 noting maximum limitation. The total score ranges from 0 to 50; when doubled, it converts into a disability rating. Reliability is verifiably high for test–retest (interclass=0.94) and internal consistency (Cronbach’s alpha=0.93). Content, concurrent, and criterion-related validity have been reported [12].

We extracted individual item scores from the psychologist’s report and totaled using the mathematical function within the Excel™ spreadsheet.

Psychosocial Stressors Severity and Patient Problem Report

The Psychosocial Stressors Severity (PSS) is a reliable and valid measure of psychosocial and environmental stressor factors that may affect or are affected by the diagnosis, treatment, and prognosis of psychiatric illnesses [15, 16]. The PSS is a one-item, three-point Likert scale that rates the impact of stressors as mild, moderate, and severe. The psychologist determined the PSS by an individual’s difference in the rating of 18 psychosocial and environmental problems (Patient Problem Report or PPR) during the year prior to the onset of chronic pain and since the onset of chronic pain. Each PPR item is rated on a four-point Likert scale from no problem to extreme problem. Items include work, interpersonal relationships, general and social activities, finances, drug and alcohol use, self-esteem, physical and emotional health, suicidal impulses, social support, and health care. The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) discusses psychosocial and environmental stressors in the section on multi-axial assessments [1].

We extracted individual PSS and PPR item scores from the psychologist’s report. We compared PPR individual item and total scores before and after the onset of the painful neuropathic condition.

Global Assessment of Function

The Global Assessment of Function (GAF) scale serves as a useful tool for planning treatment and measuring and predicting outcomes, especially in psychiatric populations [6]. It has been used to measure function in individuals with chronic [2, 11] and acute pain [5]. The GAF is a 100-point measurement rating overall psychological, social, and occupational functioning of people 18 years of age and older. Although it excludes physical and environmental impairment, the GAF is a reliable and valid measure of social functioning [7]. Each ten-point range has two components: one for symptom severity and the other for functioning [1]. When symptoms and functioning are discordant, the rating reflects the worse of the two. Higher ratings reflect higher levels of functioning. The GAF is included in the DSM-IV-TR in the section on multi-axial assessments.

We extracted individual item scores from the psychologist’s report and totaled using the mathematical function within the Excel™ spreadsheet.

Table 1 Demographic data.

	Frequency	Percent
Gender (n=91)		
Female	64	70.33
Male	27	29.67
Ethnicity (n=91)		
Non-Hispanic	17	18.68
Hispanic	74	81.32
Education (n=91)		
Grade school and less	28	30.77
High school	29	31.87
Post high school/college	34	37.36
Marital status (n=91)		
Married	55	60.44
Not married	36	39.56
Litigation status (n=90)		
No	60	66.66
Yes	30	33.33
Surgical treatment (n=91)		
No	34	37.36
Yes	57	62.64

Analysis

Using a priori power analysis for a medium effect size, power of 0.80, and alpha of 0.05, we determined that data from 85 medical records were necessary to meet correlational significance [3]. Post hoc power analysis for a medium effect size, power of 0.80, and alpha of 0.05 indicated that a sample size of 67 and 87 were necessary to reach statistical significance for multiple regression and chi-square measurements, respectively.

Data were imported from the Excel™ spreadsheet into the SAS computerized statistical program. Using SAS version 9.1, a statistician from the university mathematics lab conducted the analysis, which consisted of descriptive statistics, Pearson correlations, multiple regression, and chi-square. In addition, the statistician calculated odds ratio to quantify the relationships between high-interest categorical variables, such as gender, ethnicity, litigation status, and type of treatment (surgical or non-surgical) with work status on follow-up.

Table 3 Suicidal ideation and substance use as documented by psychologist.

	Frequency	Percent
Suicidal thoughts (n=90)		
None	61	67.78
Thoughts of self harm	6	6.67
Suicide ideation	14	15.56
Suicide attempt	9	10.00
Alcohol use (n=91)		
None	64	70.33
Slight	19	20.88
Social drinker	2	2.20
Moderate	6	6.59
Tobacco use (n=90)		
None	66	72.53
Slight	9	9.89
Moderate	10	10.99
Heavy	6	6.59

Results

Demographics and Pain Level

Ninety-one consecutive medical records fit the inclusion criteria. The sample closely reflects the population of the US–Mexico border city where the clinic practice is located. The majority of the sample was Hispanic (74 or 81.3%), female (64 or 70.3%), and married (55 or 60.4%). Educational level was split into three groups: grade school or less (28 or 30.8%), high school (29 or 31.9%), and college or post-high school training (34 or 37.4%). Eighty-seven (93%) patients presented to the clinic for work-related injuries. Thirty patients (33.3%) were litigating for compensation related to work-related or other injury. Fifty-seven (63%) patients had surgery performed by the first author. See Table 1.

At the time of the first visit to the psychologist, the mean age was 42.6 years old (median 42, mode 43; range 17–70). Patients reported experiencing pain an average of 3.5 years and reporting the modal/median average level of pain experienced in the past week as 7, least as 5, and worst as 10 on a numerical rating scale ranging from 0 (none) to 10 (worst pain

Table 2 Age and pain (reported in years).

	N	Mean	Median	Mode	SD	Range
Age	91	42.64	42	43	10.049	17–70
Pain duration at time of visit to psychologist	91	3.457	3	1	3.574	0.08–22
Pain duration last visit with surgeon	91	5.761	5	4	4.197	0.5–23
Length of surgeon follow-up after psych evaluation	90	2.43	2	2	2.029	0–10
Pain level initial visit with surgeon	89	7.483	8	8	2.266	2–10
Pain level usual as reported to psychologist	89	7.044	7	7	1.544	3–10
Pain level least as reported to psychologist	89	5.022	5	5	2.061	0–10
Pain level worst as reported to psychologist	89	9.146	9	10	1.050	5–10

Table 4 Stressors and function.

	Frequency	Percent
Psychosocial stressors severity (n=86)		
Mild	1.16	1
Moderate	15.12	14
Severe	83.72	86
GAF ranking for social, occupation, or school functioning (n=87)		
Serious difficulty (41–50)	24	27.59
Moderate difficulty (51–60)	50	57.47
Some difficulty (61–70)	12	13.79
Good in all areas (71–80)	1	1.15

imaginable). The psychologist documented that all patients who reported planning on surgery for their underlying medical condition expected total relief of pain after surgery. The surgeon followed the patients for an average of 2.43 (median/mode of 2) years after the initial visit with the psychologist. See Table 2.

Psychosocial Characteristics and Stressors

Primary and secondary psychological diagnoses included mood disorders, adjustment disorders, and anxiety primarily related to chronic pain. Ninety of 91 (98.9%) patients received a primary psychiatric diagnosis, and 12 received an additional secondary diagnosis. Over 92% (83 of 90) of patients had mood disorders with 79.1% (72 of 90) diagnosed with major affective depressive disorder and another 13.3% (13) with depressive disorder. Of the remaining seven patients with primary psychiatric diagnoses, all diagnoses were pain-related. One was diagnosed with conversion disorder and six with adjustment disorders. All secondary diagnoses were categorized as anxiety related to pain. These included three incidences of posttraumatic stress disorder and one case of phobia (claustrophobia) secondary to full-body magnetic resonance imaging conducted as part of medical diagnostic procedures for pain.

Just over 32% of patients (29 of 90) reported thoughts of self-harm, suicidal ideation, or suicide attempt secondary to chronic pain. See Table 3. The PPR scores supported these findings. During the year prior to the onset of pain, only two patients reported mild or moderate problems with suicidal impulses. Conversely, at the time of the visit to the psychologist, 18 reported mild to moderate problems with suicidal impulses, and another seven reported extreme problems (25 of 90 or 27.8%). However, we noted no reports of successful suicides in the medical records; and no records were excluded for this reason.

The psychologist documented substance use and abuse. All patients denied illicit drug use, and the majority denied alcohol (64 of 91) and tobacco (66 of 91) use. Three patients acknowledged a prior history of alcohol abuse, while eight (8.8%) patients identified themselves as social or moderate drinkers of alcohol. Likewise 16, (17.6%) reported moderate to heavy smoking. According to the PPR, no one reported problems with drug use the year prior to the onset of pain and 83 (92.2%) reported no problem, three (3.3%) a mild problem, one (1.1%) a moderate problem, and one (1.1%) a severe problem with alcohol. There was no difference in the number of individuals reporting problems with alcohol and drug use after pain incident. See Table 3.

Functioning

The psychologist documented Psychosocial Stressors Severity scores on 86 patients and Global Assessment of Function on 87 patients. Almost 84% reported that stressors severely affected their health. Likewise, the majority of individuals experienced pain and other psychosocial symptoms that led to moderate (57.5%) or serious (27.6%) difficulty in social, occupational, or school functioning. See Table 4. The areas of the PPR that patients reported most problematic were emotions, social relationships and activity, finances, physical health, self-esteem, and support (p>0.001).

Work Status

Work was defined as employment, retirement, or student status. Prior to the onset of the painful neuropathic condition, 6.6% (6 of 91) of individuals reported not working. At the time of the psychologist visit, about 64% (58 of 91) were not working, while the number of students increased from 1 to 5, and the number of retirees remained the same. At the last follow-up visit with the surgeon, the number of unemployed patients 6.6% (6 of 91) was no different from the number of non-workers prior to onset of chronic limb pain. In addition, 7.7% (7 of 91) of individuals were classified as disabled based on Social Security criteria. See Table 5.

Table 5 Work Status at three different time periods (n=91).

	Not working	Working	Retired	Student	Disabled
Prior to pain/injury	6 (6.6%)	81 (89%)	3 (3.3%)	1 (1.1%)	na
Time of psychologist visit	58 (63.7%)	25 (27.5%)	3 (3.3%)	5 (5.5%)	na
Posttreatment (time of last follow-up visit with surgeon)	6 (6.6%)	72 (79.1%)	5 (5.5%)	1 (1.1%)	7 (7.7%)

na not applicable

Table 6 Maximum likelihood estimates for post treatment work status (n=91).

Parameter	*df*	Estimate	Standard error	Wald chi-square	Pr>chi-square
Surgery	1	−0.00249	0.3414	0.0001	0.9942
Gender	1	0.1430	0.3446	0.1723	0.6781
Ethnicity	1	−0.3618	0.4479	0.6527	0.4192
Education: grade school and less	1	0.2063	0.5499	0.1408	0.7075
Education: high school	1	−0.9239	0.6749	1.8744	0.1710
Education: post high school/college	1	0.5599	0.6186	0.8191	0.3654
Marital status	1	0.1819	0.3525	0.2663	0.6058
Litigation status	1	0.1645	0.3452	0.2272	0.6336

Pr probability

Other Outcomes

The psychologist measured psychosocial function, while the surgeon noted type of treatment and posttreatment work status. At the time of the psychologist's evaluation, function using GAF total scores was negatively correlated with total Oswestry scores (−0.3455, p=0.0014), usual pain level (−0.221, p=0.0411), and total PPR (−0.5318, p>0.00001). Gender, ethnicity, age, education, litigation status, or total PPR scores in the year prior to the onset of painful neuropathic condition were not significantly associated with GAF scores or level of pain. There was no statistical difference in posttreatment work status based on gender, ethnicity, marital status, or report of litigation for compensation. See Table 6. Furthermore, no differences were noted between surgical/non-surgical treatment groups on a variety of psychosocial measures including pain level (p=0.35 for usual pain and 0.97 for worst pain), litigation status (p> 0.5), and posttreatment work status (p=0.84). To quantify the relationships between high-interest categorical variables, such as gender, ethnicity, litigation status, and type of treatment (surgical or non-surgical) with work status on follow-up, the statistician calculated odds ratio for each pair. See Table 7.

Table 7 Odds ratio estimates for post treatment return to work (n=91).

Effect	Point estimate	95% Wald confidence limits	
Surgery	0.995	0.261	3.793
Gender	1.331	0.345	5.139
Ethnicity	0.485	0.0084	2.807
Litigation	1.390	0.359	5.378
Marital status	1.439	0.361	5.726
Age	0.939	0.871	1.012
Duration of pain	0.901	0.168	4.839
Length of follow-up	1.014	0.195	5.279

Discussion

Depression frequently co-exists with chronic neuropathic pain, and thoughts of self-harm, suicidal ideation, or suicide attempt secondary to chronic pain is high (almost a third in this population). Serious impairment in occupational and social functioning due to pain was present in our population an average of 3 years after the onset of painful neuropathic condition and, in some cases, persisted for 22 years. Therefore, assessment of and intervention for depression and suicidal ideation along with adequate pain management is critical in chronic limb pain patients.

Of interest, the majority of patients expected total relief of pain with surgical treatment, which points to the need for realistic pre-operative discussions of anticipated outcome. Such discussions may diffuse postoperative patient anger or disappointment if the result does not meet expectation.

Our posttreatment work status rate is higher than that reported in the literature [4]. Likewise, our findings differed from other research [17] in that patients who litigated for compensation were just as likely to return to work as individuals who did not litigate. In this study, the vast majority of patients returned to work and remained at work more than 5 years after onset of nerve injury/condition. As part of the treatment plan, the surgeon worked with the patient to set a return-to-work date based on sensory and motor recovery, not on pain levels. In the presence of adequate pain management, the expectation that the patient will return to work may play a considerable role in posttreatment work status.

Limitations of the Study

Like all retrospective research, lack of control over recorded information limited data collection. First, we have no record of the number of patients referred to the psychologist who did not go or who went but did not return to us for follow-up. Next, despite the vast number of charts reviewed, including numerous charts of long-term patients, we located only a few (about six) follow-up reports from the psychologist. Therefore, we do not know who received evaluation plus treatment from the psychologist. Lastly, over a period of 10 years, the practice of medicine and psychology changed, as did reporting. Therefore, our access was limited to the psychological testing that remained consistent over 10 years. Conversely, the same surgeon and psychologist conducted the assessments over the time, lending some uniformity to evaluation and treatment.

From 1995 to 2005, we routinely measured pain at each clinic visit using the one-dimensional numerical rating scale. The single numerical value reflects only the complex perception of pain in a brief moment in time and not overall success of treatment. For example, patients experiencing breakthrough pain during their clinic visit will rate their pain level high. Thus, the numerical pain score reflects the loss of pain control during a circumscribed time span. Although meaningful to the clinician in assessing and adjusting pain management, the NRS provides little information regarding the overall success in treating the underlying neuropathic condition. If taken out of context, the single measure of pain may be interpreted as treatment failure and, in turn, lead to overtreatment, i.e., an additional surgery and exposure to complications. Therefore, for this study, our outcome measure was limited to posttreatment work status.

We recommend that future studies incorporate multidimensional assessments of pain and function as outcome measures in chronic limb pain patients with neuropathy. This is consistent with recommendations in the literature [14]. A prospectively designed study comparing outcomes of surgical and non-surgical treatment that measures influence of or controls for presence and treatment of psychosocial factors is warranted. In addition, patient expectations influence outcomes in injured workers [4]. Thus, prescribing a return-to work-date early in the rehabilitation process is a promising yet simple intervention. Thus, we recommend further investigation on the impact of a prescription with a plan to return-to-work during the rehabilitation process.

Implications for Practice

Chronic pain patients with neuropathic conditions have historically had poor outcomes, whether treated with or without surgery [8, 10]. In part, this may be attributed to the fact that surgical training does not usually include a good foundation in managing psychosocial problems. Alternatively, when it is necessary to do so, many surgeons shy away from addressing these problems because they do not have the necessary educational background, experience, or comfort in confronting depression and its sequelae or because it is too time consuming. Oftentimes in a busy or specialty practice, it is much easier to attribute problems to patients' wanting secondary gains than to address depression and psychosocial needs of the patient. However, addressing psychosocial problems in patients with chronic neuropathic pain is consistent with the national guidelines for management of chronic pain (see www.ngc.gov); and the beneficial impact on outcomes is becoming evident [13, 17].

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