A Prospective Evaluation

Reliability of Psychological Evaluation in Chronic Pain in an Interventional Pain Management Setting

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Background: Psychological disorders may be associated with poor pain related treatment outcomes. However, there may be limitations with studies evaluating the relationship between pain and psychopathology.

Objective: To assess the reliability of psychological evaluations in interventional pain management by MCMI-III® and P-3®.

Study Design: Prospective evaluation of consecutive patients in an interventional pain management center.

Methods: Patients were evaluated using a DSM-IV-TR® questionnaire with a physician interview as an integral part of their comprehensive evaluation. In addition, all the patients participating in this study also underwent psychological evaluation with MCMI-III and P-3. A positive diagnosis of major depression or generalized anxiety disorder based on DSM-IV-TR criteria was considered as the criterion standard.

All of the patients presented for treatment of chronic pain.

The data based on the criterion standard were compared with results of the diagnostic impression from the MCMI-III and the P-3 evaluation utilizing criteria for average, and above average, patient pain scores.

Results: Major depression was diagnosed in a total of 59 of 100 patients using DSM-IV-TR criteria, in 32 patients based on MCMI-III criteria, and in 55 patients based on P-3 evaluations utilizing average pain patient criteria.

Generalized anxiety disorder was diagnosed in 55 patients by means of DSM-IV-TR, 45 patients by MCMI-III, and 55 patients by P-3 Profile utilizing average pain patient scores.

The specificity of MCMI-III was 100% with a sensitivity of 54% for diagnosis of depression; whereas it was 78% specificity and sensitivity for P-3, with average pain patient scores. For generalized anxiety disorder, specificity of MCMI-III was 89% with a sensitivity of 73% compared to specificity of 80% and sensitivity of 84% for average pain patient scores for P-3.

Conclusion: MCMI-III and P-3 are highly specific in diagnosing depression and generalized anxiety disorder, with variable sensitivity. A DSM-IV-TR questionnaire evaluation incorporated into the pain management questionnaire, along with a short clinical interview, is a reliable means of assessing depression and anxiety in patients suffering with chronic pain.

Keywords: Psychiatric disorders, mental disorders, chronic pain, depression, generalized anxiety disorder, DSM-IV-TR, MCMI-III and P-3.

Albert Schweitzer, the humanitarian, physician, and 1931 Nobel Laureate, elegantly described the nature of pain: "Pain is a more terrible lord of mankind than even death itself" (1). The Roman emperor and philosopher Marcus Aurelius wrote, "when unbearable pain destroys us… Recollect this, too, that many of our everyday discomforts are really pain in disguise such as drowsiness or want of appetite" (2). Further, the mutual inter-action between physical pain and one's world view has been observed by philosophers and religious figures (3). Consequently, chronic pain is recognized as a complex phenomenon involving sensory, cognitive, affective, and behavioral components. Over the years, it has become increasingly evident that chronic pain is associated with high rates of recognized and unrecognized psychopathology (4).

Multiple reasons have been described to identify psychopathology in chronic pain patients. It has been shown that unrecognized and untreated psychopathology can significantly interfere with the successful management of chronic pain and patient rehabilitation (5-7), predictive of poor surgical outcomes (6, 8), and may increase pain intensity and disability, thus serving to propitiate pain-related dysfunction (8). A diagnosis of depression correlates with increased pain and less successful treatment outcomes (5, 6,8). Anxiety has been found to decrease a patient's pain threshold and tolerance (9); also, anxiety and depression have been associated with a magnification of medical symptoms (10). In addition, emotional distress has been linked to physical symptoms through autonomic arousal, and vigilance (11), or somatic amplification (12). Consequently, prior to embarking on an appropriate treatment program – surgical, interventional, or behavioral – an accurate assessment of a patient's condition is essential. Thus, an appropriate evaluation in interventional pain management should not only include an appropriate history and physical examination, and a functional assessment, but also a psychological assessment as well.

There is extensive evidence associating chronic pain and mental disorders (4-25). Multiple studies have shown that depression and anxiety are highly prevalent among persons with chronic pain.

In samples evaluating chronic pain patients, rates of current major depression and anxiety can range from 15% to 54%, significantly higher than the rate of 5% to 10% (without pain) found in the general population. Consequently, a considerable amount of research, using numerous psychological instruments, has been devoted to profiling the psychological and behavioral characteristics of chronic pain patients (22). Apart from developing a better understanding of the psychological mechanisms enhancing the chronic pain experience, ideally psychological profiles should be useful for classifying individual patients, determining treatment strategies, and predicting treatment response. Psychological screening seems to be most useful for those patients with lesser degrees of disc pathological findings, longer disability, and confounding economic issues (26).

Assessment of psychological status is achieved using interviews and self-report instruments. Ideally, psychological evaluation is performed by a trained psychologist or psychiatrist with interview and utilization of self-report instruments. This requires identification of patients requiring the services of a psychologist or a psychiatrist, plus an assessment of the availability and pain management interests of these specialists within the community. In addition, referring patients to a psychologist or psychiatrist outside the pain management setting may result in delays in the evaluation of psychological status from the initial pain management evaluation.

Finally, the feasibility of psychological services also depends highly upon financial resources. Consequently, the comprehensive psychological interview and evaluation not only are extensive and expensive, but are not covered by many insurers, resulting in multiple practical problems for interventional pain physicians, including delays in the treatment process.

Waddell and Turk (27) asserted that psychological diseases can not be assessed reliably by general physicians or surgeons by clinic impression alone. However, they referred to only the general clinical interview rather than to a psychological questionnaire that evaluated major depression based on criteria in the *Diagnostic and Statistical Manual* (DSM) of the American Psychiatric Association. Clinical trials have established the efficacy of anti-depressant medications and specific psychotherapies for depressive psychiatric and primary care patients when care is provided by trained personnel or under standardized protocols (28-33). But, there are no such studies available that address either the effectiveness of psychological status evaluation by interventional pain physicians or the effectiveness of anti-depressant and anti-anxiety therapy.

This evaluation was undertaken to evaluate the prevalence of depression and anxiety in chronic pain patients by a physician interview and application of *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision™ (DSM-IV-TR) criteria (36), and to compare the results with Millon Clinical Multiaxial Inventory™-III (MCMI-III) (34) and Pain Patient Profile Manual® (P-3) (35).

Methods

A total of 100 consecutive patients were evaluated, all of whom presented with chronic pain to an interventional pain management practice. All patients were evaluated with history, physical examination, psychological evaluation, review of records, and the administration of a DSM-IV-TR questionnaire with a physician interview as an integral part of their comprehensive evaluation such as is provided to the majority of the patients presenting to this organization. In addition, all the patients participating in the study also underwent psychological evaluation with MCMI-III and P-3.

Informed Consent

All patients were provided an explanation of the purpose of the study and an opportunity for discussion. They were also advised that the psychological evaluation might result in a referral to psychological services and/or the administration of anti-depressant and anti-anxiety therapy. Informed consent was then obtained. Appropriate precautions were taken to protect the privacy and anonymity of all patients included in the study.

Inclusion and Exclusion Criteria

Inclusion criteria for patients in the study consisted of chronic pain of at least two year's duration, over 18 years of age, ability to comprehend and read in order to respond to MCMI-III and P-3 psychological evaluations, ability to understand written informed consent, and willingness to participate in the study.

Exclusion criteria included inability to understand or participate in psychological testing, inability to understand informed consent, and unwillingness to participate in the evaluation.

Evaluation

The study focused on two issues related to mental disorders: depression and anxiety. The psychological status of each patient was evaluated by obtaining a psychological history using a DSM-IV-TR criteria-based questionnaire for depression and anxiety; this was followed by a physician interview. Patients were also administered MCMI-III and P-3 evaluations.

The comprehensive evaluation includes multiple questions to determine depression and anxiety. Positive responses as determined by a DSM-IV-TR questionnaire and by personal interview were considered the diagnosis of major depression and generalized anxiety disorder. These criteria are listed in Tables 1 and 2.

MCMI is a commonly used test delineating psychological involvement in various medical syndromes. The MCMI-III is the latest version and it evaluates personality disorders and various clinical syndromes, including generalized anxiety disorder, depression, and somatoform disorder (34). The MCMI consists of 175 questions and does not require the presence of a psychologist for administration; it can be administered in outpatient settings in interventional pain practices.

The P-3 is an instrument for briefly assessing psychological characteristics known to affect pain perception and treatment response of patients in pain (35). The P-3 consists of 34 items that evaluate depression, anxiety, and somatization. A computerized profile is produced with an interpretation comparing the pain patient to a national sampling of patients in pain.

Criterion Standard

A patient was considered to have major depression or generalized anxiety disorder based on DSM-IV-TR criteria by questionnaire and personal interview (33). These data were compared with the results of MCMI-III and P-3. Diagnostic impression was utilized to compare results with MCMI-III. For the P-3, a diagnostic impression score

Table 1. *Diagnostic criteria of major depressive episodes*

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.
  Note: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

  (1) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). **Note:** In children and adolescents, can be irritable mood.
  (2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
  (3) significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. **Note:** In children, consider failure to make expected weight gains.
  (4) insomnia or hypersomnia nearly every day
  (5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
  (6) fatigue or loss of energy nearly every day
  (7) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
  (8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
  (9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

B. The symptoms do not meet criteria for a Mixed Episode

C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).

E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

Adapted from the *Diagnostic and Statistical Manual for Mental Disorders*. Fourth Edition, Text Revision™ (DSM-IV-TR). American Psychiatric Association. Washington: 2000.

Table 2. *Diagnostic criteria for Generalized Anxiety Disorder*

A. Excessive anxiety and worry (apprehensive expectation), occurring more days than not for at least 6 months, about a number of events or activities (such as work or school performance).

B. The person finds it difficult to control the worry.

C. The anxiety and worry are associated with three (or more) of the following six symptoms (with at least some symptoms present for more days than not for the past 6 months). **Note:** Only one item is required in children.

  (1) restlessness or feeling keyed up or on edge
  (2) being easily fatigued
  (3) difficulty concentrating or mind going blank
  (4) irritability
  (5) muscle tension
  (6) sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep)

D. The focus of the anxiety and worry is not confined to features of an Axis 1 disorder, e.g., the anxiety or worry is not about having a Panic Attack (as in Panic Disorder), being embarrassed in public (as in Social Phobia), being contaminated (as in Obsessive-Compulsive Disorder), being away from home or close relatives (as in Separation Anxiety Disorder), gaining weight (as in Anorexia Nervosa), having multiple physical complaints (as in Somatization Disorder), or having a serious illness (as in Hypochondriasis), and the anxiety and worry do not occur exclusively during Posttraumatic Stress Disorder.

E. The anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

F. The disturbance is not due to the direct physiological effects of substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hyperthyroidism) and does not occur exclusively during a Mood Disorder, a Psychotic Disorder, or a Pervasive Developmental Disorder.

Adapted from the *Diagnostic and Statistical Manual for Mental Disorders*. Fourth Edition, Text Revision™ (DSM-IV-TR). American Psychiatric Association. Washington, 2000.

of (>54), and a threshold score of >45 was used for average chronic pain patients.

Statistical Methods

Data were recorded on a database using Microsoft® Access® Statistical Package for the Social Sciences (SPSS) software, version 9.0, was used to generate the frequency tables. The chi-squared statistic was used to test significant differences between genders. Results were considered statistically significant if the *P* value was less than 0.05.

RESULTS

From October 2003 to April 2004, a total of 136 new patients with chronic pain were evaluated. Of these, 116 patients were eligible to participate in the study, and met the inclusion criteria. Sixteen patients refused to participate.

Demographic Characteristics

As illustrated in Table 3, patients were predominantly female with an average age of 45 years, an average weight of 193.2 pounds, and an average height of 67.5 inches. Their average duration of pain was 9.4 years, and the majority provided with a history of traumatic event leading to their pain problems.

Psychological Status

Psychological status was evaluated by DSM-IV-TR questionnaire and personal interview as illustrated in Tables 4 and 5. Analyses were carried out with diagnostic impression with MCMI-III and P-3 results.

For P-3, a diagnostic impression required scores above those of average chronic pain patients (>55 for anxiety and >54 for depression). In contrast, for MCMI-III, positive diagnostic impression was variable based on multiple factors;

thus, only the diagnostic impression was utilized, rather than cut-off scores.

As expected, there were significant differences among two categories in P-3, namely average chronic pain patient scores and above average chronic pain patient scores (Table 4), leading to the diagnosis of anxiety in 21% vs 55% ($p < 0.001$) and depression, 22% vs 55% ($p < 0.001$).

Major Depression

Using DSM-IV-TR criteria, major depression was identified in 59 of the 100 patients in the study; 29 of the 59 patients were among the 38 patients in the study already on anti-depressant therapy, while 30 of those found to have major depression were from the 62 patients not on anti-depressant therapy (Table 5).

Under the MCMI-III evaluation, a total of 32 of the 100 patients in the study were identified with depression; of these, 18 were among the 38 patients already on anti-depressant therapy, and 14 were among the 62 patients not on anti-depressant therapy. There was a significant correlation (coefficient 0.572) between the DSM-IV-TR diagnosis and the MCMI-III diagnosis (Table 7).

On P-3 evaluation, only nine of the 38 patients already on anti-depressant therapy, and 13 of 62 patients not on anti-depressant therapy were diagnosed with major depression, for a total of 22 out of the 100 patients in the study. Consequently, the P-3 missed 37 patients identified with major depression using DSM-IV-TR criteria, and had a poor correlation when diagnostic impression was utilized. However, with P-3 scores of average chronic pain patients (>45), depression was present in 24 of 38 patients already on anti-depressant therapy, and in 31 of 55 patients not on anti-depressant therapy, with a total positive rate of 55%. The correlation coefficient between MCMI-III and P-3 was 0.433.

The data also showed that only 29% of the patients in the study identified positive for major depression under all three tests. When utilizing the average chronic pain criteria, the P-3 had a false-positive rate of 22%. There were no false-positives with the MCMI-III evaluation or with the P-3 when utilizing above average chronic pain criteria (score of >54). In contrast, a false-negative rate of diagnosis was present in 46% based on MCMI-III testing, 22% when using the P-3 based on average pain patient criteria, and 63% by the P-3 based on above average pain patient criteria.

Table 3. *Demographic characteristics*

		Number of patients in study (100)
Gender	Men	40% (40)
	Women	60% (60)
Age (yrs)	Range	21-79
	Mean ± SD	45.0 ± 13.3
Weight (lbs.)	Range	90-347
	Mean ± SD	193.2 ± 54.2
Height (inches)	Range	59-76
	Mean ± SD	67.5 ± 4.2
Mode of onset	Non-traumatic	44% (44)
	Traumatic	56% (56)
Duration of pain (yrs)	Mean ± SD	9.4 ± 8.7
Average pain score (0-10)	Mean ± SD	7.6 + 1.42

Table 4. *Results of psychological evaluation of depression by DSM-IV-TR, MCMI-III, and P-3*

		Depression	Generalized Anxiety Disorder
DSM-IV-TR		59/100	55/100
MCMI-III		32/100	45/100
P-3 profile	Average pain patient scores (>45)	55/100	55/100
	Above average pain patient scores (>54 or >55)	22/100	21/100

Table 5. *Results of evaluation of depression by DSM-IV-TR, MCMI-III, and P-3*

Depression	DSM-IV-TR	MCMI-III		P-3			
				Average pain patient scores (> 45)		Above average pain patient scores (> 54)	
Anti-depressant therapy (38)	76% (29)	47% (18)		63% (24)		24% (9)	
No anti-depressant therapy (62)	48% (30)	23% (14)		50% (31)		21% (13)	
Total (100)	59% (59)	32% (32)		55% (55)		22% (22)	
Anti-depressant therapy		Positive	Negative	Positive	Negative	Positive	Negative
	Positive (29)	18	11	22	7	9	20
	Negative (9)	0	9	2	7	0	9
	False-positive rate	0%		22%		0%	
	False-negative rate	38%		24%		69%	
	Specificity	100%		78%		100%	
	Sensitivity	62%		76%		31%	
No anti-depressant therapy		Positive	Negative	Positive	Negative	Positive	Negative
	Positive (30)	14	16	24	6	13	17
	Negative (32)	0	32	7	25	0	32
	False-positive rate	0%		22%		0%	
	False-negative rate	53%		20%		57%	
	Specificity	100%		78%		100%	
	Sensitivity	47%		80%		43#	
Total		Positive	Negative	Positive	Negative	Positive	Negative
	Positive (59)	32	27	46	13	22	37
	Negative (41)	0	41	9	32	0	41
	False-positive rate	0%		22%		0%	
	False-negative rate	46%		22%		63%	
	Specificity	100%		78%		100%	
	Sensitivity	54%		78%		37%	

( ) = Number of patients

The diagnosis of depression by MCMI-III specificity was 100%, whereas sensitivity was 54%. In contrast, the specificity and sensitivity was 78% with P-3 utilizing average pain patient scores. However, the specificity was 100% with an extremely low sensitivity of 37% with P-3 when above average pain patient scores were utilized.

Generalized Anxiety Disorder

Using DSM-IV-TR criteria, generalized anxiety disorder was diagnosed in 18 of 22 patients on anti-anxiety therapy, and 37 of 78 patients not on anti-anxiety therapy for a total of 55 of 100 patients in the study.

MCMI-III evaluations provided a diagnosis of anxiety for 14 of 22 patients already on anti-anxiety therapy, and for 31 of 78 patients not on anti-anxiety therapy for a total of 45% of the patients in the study being diagnosed with generalized anxiety disorder (Table 6). The correlation was significant with a correlation coefficient of 0.616 (Table 8).

P-3 evaluations using the above average (score of >55) criteria established diagnoses of anxiety for six of 22 patients already on anti-anxiety therapy, and for 15 of 78 patients not on anti-anxiety therapy, for a total of 21 of the 100 patients in the study. However, utilizing the P-3 scores of average chronic pain patients (score of >45) established that anxiety was present in 15 of 22 patients on anti-anxiety therapy, and present also in 40 of 78 patients not on anti-anxiety therapy, for a total of 55 of the 100 patients in the study evaluating positive for anxiety (Table 6). The correlation coefficient with DSM-IV-TR was 0.616, and with MCMI-III it was 0.466 (Table 8).

The data showed that only 36% of the patients were evaluated as positive for anxiety by all three tests, in contrast to 45% to 55% positive rates with the individual tests. In addition, false-positive rates of 11% and 20% were observed with the MCMI-III and the P-3 when applying average pain patient scores; false-negative rates of 27% and 16% were observed with

Table 6. *Results of evaluation of generalized anxiety disorder by DSM-IV-TR, MCMI-III, and P-3*

Generalized anxiety disorder	DSM-IV-TR	MCMI-III		P-3			
				average pain patient scores (> 45)		Above average pain patient scores (> 55)	
Anti-anxiety therapy (22)	82% (18)	64% (14)		68% (15)		27% (6)	
No anti-anxiety therapy (78)	47% (37)	40% (31)		51% (40)		19% (15)	
Total (100)	55% (55)	45% (45)		55% (55)		21% (21)	
		Positive	Negative	Positive	Negative	Positive	Negative
	Positive (18)	13	5	15	3	6	12
	Negative (4)	1	3	0	4	0	4
Anti-anxiety therapy (22)	False-positive rate	25%		0%		0%	
	False-negative rate	28%		17%		67%	
	Specificity	75%		100%		100%	
	Sensitivity	72%		83%		33%	
		Positive	Negative	Positive	Negative	Positive	Negative
	Positive (37)	27	10	31	6	15	22
	Negative (41)	4	37	9	32	0	41
No anti-anxiety therapy (78)	False-positive rate	10%		22%		0%	
	False-negative rate	27%		16%		59%	
	Specificity	90%		78%		100%	
	Sensitivity	73%		84%		41%	
		Positive	Negative	Positive	Negative	Positive	Negative
	Positive (55)	40	15	46	9	21	34
	Negative (45)	5	40	9	36	0	45
Total	False-positive rate	11%		20%		0%	
	False-negative rate	27%		16%		62%	
	Specificity	89%		80%		100%	
	Sensitivity	73%		84%		38%	

( ) = Number of patients

Table 7. *Correlation of depression assessment*

	DSM-IV-TR	MCMI-III	P-3 Average pain
DSM-IV-TR	1.0000	0.616*	0.636*
MCMI-III		1.000	0.495*
P-3 (Average Pain)			1.000

Table 8. *Correlation of Generalized Anxiety Disorder assessment*

	DSM-IV-TR	MCMI-III	P-3 Average pain
DSM-IV-TR	1.0000	0.554*	0.572*
MCMI-III		1.000	0.491*
P-3 (Average Pain)			1.000

* p < 0.001

the MCMI-III and the P-3 when utilizing average pain patient scores.

The data also showed that specificity and sensitivity of MCMI-III in diagnosing generalized anxiety disorder was 89% and 73%, compared to 80% and 84% with P-3 utilizing average pain patient scores. In contrast, utilizing above average pain patient scores for P-3 specificity was 100%, however, with a low sensitivity of 38%.

Combined Depression and Anxiety

The evaluation also showed that 45 of 100 patients suffered with combined major depression and generalized anxiety disorder under DSM-IV-TR criteria (Table 9).

Table 9. *Combination of Depression and Generalized Anxiety Disorder by DSM-IV-TR criteria*

		Anxiety		Total
		Negative	Positive	
Depression	Negative	35	6	41
	Positive	10	49	59
	Total	45	55	100

DISCUSSION

Among the 100 patients in the study, based on DSM-IV-TR criteria, this prospective evaluation established a diagnosis of major depression in 59% of the patients, generalized anxiety disorder in 55%, and combined diagnoses in 49%. The results of DSM-IV-TR evaluations correlated well with MCMI-III evaluations when considering diagnoses of major depression and generalized anxiety disorder having correlation coefficients of 0.616 and 0.572. Both with major depression and generalized anxiety disorder, the correlation was poor when utilizing the P-3 evaluation applying above average criteria. However, the correlation improved significantly with the application of average scores of pain patients yielding correlation coefficients with DSM-IV-TR of 0.636 with depression and 0.572 with anxiety. Further, the P-3 average pain scores correlated well with the MCMI-III with correlation coefficients of 0.495 for depression and 0.491 for anxiety.

The results demonstrated that major depression and generalized anxiety disorder are commonly seen in patients suffering with chronic pain, even among those on anti-depressant and/or anti-anxiety therapy. Fourteen patients in the study were receiving a combination of anti-depressant therapy and anti-anxiety therapy; 38 patients were receiving anti-depressant therapy; and 21 patients were receiving anti-anxiety therapy. This study establishes the reliability of evaluations for depression and generalized anxiety disorder based on DSM-IV-TR criteria utilizing a questionnaire and simple interview, MCMI-III evaluations, or P-3 evaluations. Further, DSM-IV-TR criteria identified depression and generalized anxiety disorder in most of those patients already on anti-depressant therapy and anti-anxiety therapy. Despite good correlations between the MCMI-III and the P-3, and the ability of both tests to identify depression and anxiety, significant rates of false-positives and false-negatives were observed for anxiety, whereas for depression, mainly false-negative rates were observed.

The accuracy of any diagnostic test is essential, but variable, just as diagnostic tests vary in sensitivity, specificity, and quality. False-positive rates (how often patients without a condition will have positive results) and false-negative rates (how often patients with disease will have a negative result) are crucial. Placebo-responses to psychological evaluations are probably least applicable since no experimental drug is provided, but even so, placebo-response may not be completely ruled out. A degree of uncertainty exists in clinical medicine, and in all diagnostic testing applied to individual patients.

In this study, false-positive rates of depression were 22% with the P-3 when using average chronic pain patient scores. However, there were no false-positives observed with the MCMI or the P-3 when utilizing above average chronic pain patient scores. In contrast false-negative rates were 46% with the MCMI, 22% with the P-3 when using average pain patient scores, and 63% when using above average pain patient scores. The results of this study show that the MCMI-III is highly specific (100%) with a sensitivity of 46%. Similarly, the P-3 when utilizing above average pain patient scores is 100% specific but with a sensitivity of 37%. When utilizing average pain patient scores, the P-3 demonstrated 78% sensitivity and 78% specificity. In contrast, for anxiety the MCMI-III showed a sensitivity of 73% and a specificity of 89%. The P-3 evaluation when using average pain patient scores showed 80% specificity and 74% sensitivity. However, while using above average pain patient scores, the P-3 specificity was 100% with a sensitivity of 38%.

The accuracy of diagnostic testing is best determined by its sensitivity (positive when condition is present), specificity (negative when condition is absent), and by comparing it to a criterion standard. DSM-IV-TR criteria is considered to be the criterion standard for this study, as diagnosis is made based on these criteria, and all psychological tests are constructed based on these criteria.

The psychological status of chronic pain patients was evaluated in multiple studies. Manchikanti et al (21,23,24) showed the prevalence of major depression to be 22% to 53% among patients, and generalized anxiety disorder to be present in 20% to 49% of patients. Polatin et al (21) showed the prevalence of depressive disorders in 49% of patients and anxiety disorders in 15% of patients.

McWilliams et al (13) evaluated depression and anxiety disorders associated with three pain conditions – arthritis, migraine, and back pain – from a nationally representative sample. Logistic regression analyses revealed significant positive associations between each pain condition and the psychiatric disorders with odds ratios ranging from 1.48 to 3.86. However, the prevalence of depression in that study ranged from 18.2% in arthritis, to 21.0% in back pain and 28.5% in migraine. Similarly generalized anxiety disorder was also seen in 5.6% of the patients with arthritis, 6.2% of the patients with back pain, and 9.1% of the patients with migraine.

The present study shows results similar to previous studies. This study shows the value of psychological evaluation utilizing DSM-IV-TR criteria with a simple questionnaire and physician interview as having significant value. In addition, the results of this study show that the MCMI-II and P-3 may not be superior, and/or may not even equal this type of evaluation. This study also demonstrated the appropriateness of diagnostic assessment in interventional pain management. It also dispels the myth that physicians are incapable of accurately evaluating patient psychological status as described by Waddell and Turk (27).

The MCMI-III is an evolving assessment tool, distinguished from other inventories with its relative brevity, theoretical anchoring, structural characteristics, and the use of a three-stage validation framework. While its comput-

er-based reports register high levels of satisfaction with users as to their overall quality and their correspondence to independently-derived clinical observations and judgments, nevertheless, clinicians who use the interpretative report should not be lulled into uncritical acceptance (34). Consequently, all the reports should routinely compare the statements generated against independent clinical evidence.

The P-3 is an instrument for briefly assessing psychological characteristics known to affect pain perception and treatment response for patients in pain. With its simplicity of format and content, the P-3 is considered to offer several advantages to pain professionals: the administration of the P-3 takes approximately 15 minutes of an initial clinical evaluation; it has clinical scales for depression, anxiety, and somatization; and of specific advantage, the intent of the P-3 is to compare the symptoms of an individual pain patient to the symptoms of an average pain patient (35).

Even with simplicity and relative inexpensiveness of the above tests and numerous other tests available in today's market, interventional pain physicians continue to be faced with multiple issues related to reliability, cost, and time. However, all of the tests have been developed based on the Diagnostic and Statistical Manual for Mental Disorders (DSM) criteria for depression, anxiety, somatization, and various other psychological disorders (36). Depression and anxiety are the two major issues in interventional pain management that can be managed with medical therapy or psychotherapy. DSM criteria may also be applied in the form of a questionnaire or personal interview during a patient's initial evaluation. The relative superiority of either MCMI or P-3 have not been proven but they may hold potential benefits such as ease of administration, time savings, cost savings, and simultaneous administration of psychological evaluations, as well as the elimination of a distant and separate evaluation.

Our study may be criticized by traditionalists because it did not utilize a psychiatrist or psychologist for evaluation and screening purposes, and also possibly because it did not include a physician interview in conjunction with administration of the MCMI-III and P-3 evaluations. Since the purpose of this evaluation was to compare the DSM-IV-TR questionnaire combined with a clinical interview by an evaluating physician to the MCMI-III and P-3, we feel that it is appropriate. In clinical practice, this approach is essential and cost effective in terms of maintaining appropriate access and managing issues of psychological importance, along with managing pain issues.

Secondly, we may be criticized for not using the MMPI evaluation as part of this study. We did not include it because the MMPI consists of 566 questions, is very expensive, and can only be administered by psychological professionals.

Thirdly, criticism of this study may focus on its small sample as opposed to large community samples and diagnostic interviews that might more adequately investigate the associations between pain conditions and psychiatric disorders (13,19). However, these requirements are financially and logistically demanding (37). Multiple authors have taken advantage of data derived from large mental health surveys that included general health and disability questions (13,19,37). McWilliams et al (13,19) showed significant associations between arthritis, back pain, and migraine with each of the mood and anxiety disorders considered. Given the lack of attention to anxiety disorders in the pain literature it was particularly noteworthy that associations between multiple pain conditions and several anxiety disorders were stronger than were the associations between various painful conditions and depression (38,39). Various limitations have been presented concerning the reliability and validity of large samples that employ diagnostic interviews to assess the presence of a wide range of psychiatric disorders and their correlation to pain (13,19,25,37-39). The prevalence of these disorders in the national population are low; consequently, these samples are not representative of patients presenting to tertiary referral centers such as interventional pain management centers (40).

Conclusion

This study showed the prevalence of depression in chronic pain patients utilizing DSM-IV-TR criteria was 59%, when using the MCMI-III it was 32%, and when using the P-3 (average pain patient scores of >45) it was 55%. Generalized anxiety disorder was seen in 55% of the patients when utilizing the DSM-IV-TR criteria, 45% when utilizing the MCMI-III, and 55% when utilizing the P-3 (average pain patient scores of >45). The MCMI-III and P-3 (average pain patient scores) were reliable in evaluating both major depression and generalized anxiety disorder.

We conclude that a DSM-IV-TR questionnaire evaluation incorporated into the pain management questionnaire, along with a short clinical interview, is a reliable means of assessing depression and anxiety in patients suffering with chronic pain.

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