Cano et al ( [1] ) recently published the findings of a study looking at marital functioning, chronic pain and psychological distress.

They found that physical disability and marital satisfaction were uniquely related to depressive symptoms whereas physical disability, pain severity, and negative spouse responses to pain were uniquely related to anxiety symptoms. Only physical disability was uniquely related to major depression.

Raphael et al. ( [2] ) conducted a study to determine whether affective inhibition and somatosensory amplification are elevated in patients with a history of myofascial face pain (MFP), which the authors suggested

"may underlie a tendency to express distress in somatic rather than affective terms, leading to somatized or masked depression."

They found that MFP cases and controls differed significantly on measures of affective inhibition and somatosensory amplification.

These differences were not accounted for by history of depression or current psychological distress.

Elevated levels of somatosensory amplification were only seen in women with active MFP symptoms.

The authors remarked that although both somatosensory amplification and affective inhibition showed a tendency to run in families, familial transmission did not account for case/control

differences.

They concluded,

"Affective inhibition and somatosensory amplification are likely to be elevated in patients with MFP. Although not accounted for by psychiatric symptomatology, the possibility that these response styles are reactive to coping with chronic face pain cannot be ruled out."

**WHICH CAME FIRST?**

Fishbain's review in 1997 suggested that depression is more likely to be a consequence than an antecedent of pain. ( [3] )

Gallagher and Verma ( [4] ) noted that there is evidence that patients with depression occurring after the onset of chronic pain have family members with the same rates of affective disorders as in the general population, and significantly lower rates than in families with major depression alone.

The authors remarked,

"This suggests that it is the stress of living with chronic pain, not personal or family predisposition, that causes depression in these patients."

In 1999 ( [5] ) Fishbain reviewed 18 studies looking at suicide in chronic pain patients. He noted,

"These studies indicated that suicide ideation, suicide attempts, and suicide completions are commonly found in CPP populations."

He further commented that chronic pain "may be a suicide risk factor."

Lawrence et al ( [6] ) conducted a primary care study which showed results that correlated with those of the Medical Outcomes Study ( [7] ) which measured health-related quality of life in patients with the chronic medical conditions of diabetes, hypertension, angina, myocardial infarction, congestive heart failure, chronic lung problems, gastrointestinal problems, back problems, and arthritis.

Five main hypotheses have been proposed (Blackburn-Munro, 2001):

- the ?antecedent hypothesis' which suggests the depression precedes the pain,
- the ?consequence hypothesis' where depression is a consequence of the pain,
- the ?scar hypothesis' where episodes of depression prior to the pain predispose the patient to depression when chronic pain occurs,
- the ?cognitive mediation hypothesis' in which psychological factors are considered to mediate interaction of pain and depression,
- the ?independent hypothesis', where pain and depression remain as distinct disease states without the same cause.

Those patients who also had depressive symptoms or a diagnosis of depressive disorder reported more often three characteristics: low perceived health, increased pain, and more disability in terms of days in bed, which were more closely associated with anxiety and depression symptoms than medical diagnoses or severity of illness as reported by health care providers.

Lawrence's study showed that certain medical diagnoses (headache, osteoarthritis, abdominal pain, and diabetes mellitus) were associated with anxiety and depression. However, they were not statistically significant indicators of anxiety and depression.

Three of the four individual diagnoses that predicted anxiety and depression symptoms (headache, abdominal pain, and osteoarthritis) in the study are painful conditions that are frequently diagnosed by primary care clinicians.

In October, 2003, at the American Neurological Association Annual Meeting, it was reported that neurology patients who report both depression and pain are likely to suffer from persistence of both conditions.

Prior research had shown that depression and pain were both common among outpatient neurology patients, with approximately two thirds of newly referred patients reporting significant pain, one third reporting depression, and one quarter reporting both.

Robinson et al. looked at 483 new referrals to neurology outpatient clinics. At baseline, 33% reported depression and 66% reported pain.

Patients were more likely to report depression at follow-up if they were depressed at baseline, had a higher baseline pain intensity, and had less change from baseline pain intensity than those without follow-up depression and they were more likely to report pain at follow-up if they had a higher baseline pain intensity, a higher rate of depression, and less change in baseline depression score from patients who had had an improvement in pain. ( [8] )

However, also in October, 2003, another study reported that depression and pain are not linked, finding no association between depression, extreme sensitivity to pain stimulus, and how pain is processed in the brain in people with fibromyalgia with and without clinical depression.

The study was presented at the annual scientific meeting of the American College of Rheumatology. It found no significant association between depression and intensity of activity in areas of the brain involved in pain processing although a link between the severity of depressive symptoms and brain activity in two brain areas not believed to be involved in pain processing was reported.

Giesecke et al. suggested that their study challenges the notion that psychiatric symptoms such as depression cause or influence the pain seen in fibromyalgia and other chronic pain conditions and instead suggests that depression is a separate and somewhat independent process.

Larson et al. ( [9] ) recently published the results of a 13 year follow up of the Baltimore Epidemiologic Catchment Area Study which is a prospective study of a household-residing cohort, selected probabilistically from East Baltimore in 1981.

The study examined the relationship between lifetime occurrence of depressive disorder and incident back pain reported over a 13-year period. In cross-sectional analyses, lifetime occurrence of depressive disorder was a significant correlate of lifetime prevalence of back pain.

Looking at the 13 year follow up, there was an increase in the risk for incident back pain when depressive disorder was present at baseline.

However, during the short term follow up of 1 year, depressive disorder at baseline was unrelated to first-ever reports of back pain. Lifetime depressive disorder at baseline and 1 year was associated with a more than three times greater risk for a first-ever report of back pain during the 12 to 13 year follow-up period, in comparison to those who did not have depressive disorder initially.

The authors concluded,

"Depressive disorder appears to be a risk factor for incident back pain independent of other characteristics often associated with back pain. Back pain is not a short-term consequence of depressive disorder but emerges over periods longer than 1 year. Moreover, in this study the alternative pathway of back pain as a risk factor for depressive disorder could not be supported."

Carroll et al. ( [10] ) examined the association between spinal pain, headache, health, demographic and socio-economic characteristics, and development of depressive symptomatology.

They found that spinal pain severity, younger age, marital status (separated/divorced/widowed), self-perceived poor health status, and comorbid neurologic and gastro-intestinal disease were

associated with onset of a new episode of depression.

In a more recent paper( [11] ), the same authors investigated whether depression is an independent risk factor for onset of an episode of troublesome neck and low back pain.

They found

"an independent and robust relationship between depressive symptoms and onset of an episode of pain."

In comparison the least depressed, those in the highest quartile of depression scores had a four-fold increased risk of troublesome neck and low back pain.

The authors concluded:

"Depression is a strong and independent predictor for the onset of an episode of intense and/or disabling neck and low back pain."

A Hungarian group ( [12] ) have recently published a paper on comorbidity of pain and depression in young women. They reported significantly higher co-prevalence rates of depression in interviewees with musculoskeletal pain problems (10.3%), frequent headaches (11.2%) compared with 6.6% and 4.6% in subgroups who denied pain.

Kroenke et al. ( [13] ) have suggested that the presence of depression or anxiety is predictive of the number and severity of physical symptoms. Conversely, Kroenke ( [14] ) also found that the presence of a physical symptom increased the likelihood of a diagnosis of a mood or anxiety disorder by as much as 3-fold.

Notably, 34% of patients with joint or limb pain, 38% of patients with back pain, 40% of patients with headache, 46% of patients with chest pain, and 43% of patients with abdominal pain also had a mood disorder.

Ericsson et al. ( [15] ) found that the presence of depression was a much better predictor of disability than the expected correlates such as personality disorder.

It seems that whilst the experience of chronic pain causes obvious suffering and distress, it is the additional factor of comorbid depression that tends to development of significant levels of disability.

It would appear logical to suggest that greater perceived levels of pain are associated with greater overall levels of distress, but a large population study of nearly 2000 patients ( [16] ) found that the effect of chronic pain on future levels of distress was explained more closely by comorbid variables such as anxiety, fatigue and abnormal illness behaviour than by the pain itself.

In their review of the epidemiology of pain and depression in primary care, Von Korff and Simon ( [17] ) made 4 broad generalizations:

- Pain is as strongly associated with anxiety as with depressive disorders;
- The number of pain sites (diffuseness of pain) and the extent to which pain interferes in daily life are the characteristics that most strongly predict depression;
- Certain psychological symptoms of depression, including low energy, sleep disturbances, and worry, are common among pain patients whereas other symptoms of depression such as guilt and loneliness are not;
- Psychological distress and disability often surface and resolve early during the course of a pain disorder that evolves into a chronic condition.

They hypothesised that pain and psychological illness have reciprocal psychological and behavioural effects, proposing two theories about the mechanisms underlying pain-depression comorbidity:

1. some individuals are genetically susceptible to both physical and psychological symptoms

and thus a state in which psychological distress amplifies unpleasant physical sensations;
2. physical and psychological stress caused by pain may induce or aggravate psychological distress.

Studies of patients with chronic myofascial face pain suggest that major depression that has its onset before or soon after the onset of the pain tends to be familial and primary.( [18] ) On the other hand, major depression that surfaces after chronic pain tends to be nonfamilial and secondary.(
[19]
)

Worz ( [20] ) contends that patients with chronic pain experience a different set of depressive symptoms to those with other severe depressive states: notably with an emphasis on irritability, dysphoria, narrowing of interests and reduced capacity for experience, which he has termed,

"algogenic psychosyndrome".

The early morning wakening, guilt and existential despair are generally absent, and psychotic features unlikely.

He further suggests that presentation of the algogenic picture suggests that pain is the precipitator of the depressive illness rather than the converse.

Gureje et al. ( [21] ) analysed data from the World Health Organization, looking at persistent pain in more than 3000 primary care patients from around the world. 49% of patients who experienced persistent pain at baseline continued to have persistent pain 12 months later.

The best independent predictor of persistent pain was the number of pain sites. Psychiatric disorder, poor self-rated overall health, and occupational related disability were also found to be independently associated with chronic pain.

Notably, persistent pain at baseline predicted the onset of a psychological disorder and vice versa, a baseline psychological disorder predicted the onset of persistent pain.

There is no doubt that a large number of medical papers have tackled this subject from the point of view of depression being the precipitating factor for pain/depression comorbidity. Many of these are persuasive.

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