Psychosomatic syndromes in fibromyalgia

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ABSTRACT

Objective. *The aim of this study was to compare the prevalence of psychosomatic symptoms in patients with fibromyalgia (FM) or rheumatoid arthritis (RA).*

Methods. *Seventy-six consecutive women with FM and 80 with RA without concomitant FM were assessed using the Diagnostic Criteria for Psychosomatic Research (DCPR) interview to evaluate the presence of psychosomatic syndromes. Beck Depression Inventory – II (BDI- II) and Form Y of the State-Trait Anxiety Inventory (STAI-Y) were administered in order to assess the symptoms of anxiety and depression.*

Results. *Significantly higher levels of anxiety and depression were found in the FM patients ($p<0.001$), and each FM patient (as against 79% of the RA patients) presented at least one DCPR syndrome. Comparisons of psychological distress between the FM patients with and without each of the psychosomatic syndromes revealed high levels of anxiety and depression in the patients with the psychosomatic condition.*

Conclusion. *The findings of this study highlight the greater presence of psychological distress and psychosomatic syndromes in patients with FM than in RA patients. The FM patients with psychosomatic symptoms also showed high levels of psychological distress. A better understanding of the psychosomatic manifestations of FM syndrome could allow clinicians to structure tailored interventions that take more account of the emotional distress associated with the physical complaints.*

Introduction

Fibromyalgia (FM) is a complex syndrome defined as chronic musculoskeletal pain for at least three months and tender point hypersensitivity in the absence of any inflammatory or organic disease that could sufficiently explain its heterogeneous symptoms (1, 2), which include sleep disturbances, fatigue, cognitive dysfunction, distress, hyperalgesia and allodynia (3-5).

It has recently been suggested that the pain of FM does not arise from the muscle itself, but from a deficit in the descending inhibitory pathway within the central nervous system (CNS) (6-7). The process of plastic change in the CNS establishing perpetual pain hypersensitivity is known as *central sensitisation* (8, 9). However, the aetiology and the evolution of FM are still unclear, and its development and maintenance may be due to a complex of factors ranging from genetic to psychological components (10-12).

A number of studies have found an association between FM syndrome and the presence of a psychiatric disorder (13-15), and some authors suggest considering FM as "depression with somatisation", a state in which the different somatic manifestations blur the emotional and cognitive symptoms (16). Various studies have highlighted the presence of alexithymia, a personality trait that makes individuals incapable of adequately recognising their own emotions and at a higher risk of neuroticism (16-19). More specifically, the difficulty that FM patients have in identifying their feelings reflects their tendency to amplify their normal bodily sensations and misinterpret the somatic symptoms of emotional arousal (20), which may arise as a result of the incorrect cognitive integration of experiences and an impaired ability to differentiate relevant from irrelevant information (19). This failure to recognise psychological distress (specifically, anxiety and depressive symptoms) appropriately may lead to the manifestation of somatisation symptoms (21), and one possible outcome is the development of abnormal illness behaviour with the patients focusing more on their physical complaints than psychological issues.

Although FM is often considered a condition with a major psychosomatic component, only a few studies have investigated the presence of somatisation (22, 23). In an attempt to shed light on this controversial subject, the aim of this study was to compare the prevalence of psychosomatic symptoms in patients with FM with that in a sample of patients with rheumatoid arthritis (RA), another disease characterised by chronic pain, but without any sign or symptom suspected for a concomitant FM diagnosis. To this end, we used the Diagnostic Criteria for Psychosomatic Research (DCPR), a structured clinical interview that was introduced in 1995 by an international group of researchers in order to provide an operational means of assessing psychosocial variables with prognostic and therapeutic implications in clinical settings. Some studies have used the interview in patients with different medical illnesses, such as anorexia nervosa, but it has never been used to assess a sample of FM patients (24, 25). We also assessed psychological distress (anxiety and depressive symptoms) and compared the FM patients with and without psychosomatic syndromes.

Materials and methods

Patient recruitment

The FM patients were consecutively recruited at the Fibromyalgia Integrated Outpatient Unit (FIOU) of the *Città della Salute e della Scienza – Presidio Molinette* Hospital of Turin, which was created as result of collaboration between the hospitals' Rheumatology Unit and the Clinical and Oncological Psychology Unit. The final sample consisted of 76 patients: 12 patients did not satisfy the inclusion criteria (see below), 15 did not give their consent to the study, and four were excluded from the analysis because of a high number of missing items.

The RA patients were recruited during routine follow-up visits to the Rheumatology Unit of the same hospital. Eighty patients satisfied the inclusion criteria and gave their written informed consent to the study.

The inclusion criteria for both samples were: 1) women with a diagnosis of FM or RA without any concomitant sign or symptom suspected for FM; 2) an age of 18–69 years; 3) at least five years' education; and 4) a good knowledge of the Italian language. The exclusion criteria were: 1) the presence of a neurological disease; and 2) the presence of a severe psychiatric disorder or a current primary psychiatric diagnosis (based on an examination by an expert psychiatrist).

Institutional Review Board approval was obtained from the *A.O.U. Città della Salute e della Scienza* Hospital of Turin, and the study was conducted in accordance with the Declaration of Helsinki.

Clinical assessment

All of the patients completed the Italian version of the revised Fibromyalgia Impact Questionnaire (FIQ-R), with the word "fibromyalgia" being replaced by "rheumatoid arthritis" for the RA sample. The FIQ-R is one of the most widely used questionnaires designed to assess the complex symptomatology related to FM syndrome (26). The questionnaire consists of 21 items scored using an 11-point Likert-type scale ranging from 0 to 10. All of the questions refer to the previous seven days. The maximum total score (the sum of the three domains of physical functioning, overall impact and symptoms) is 100, with higher scores indicating a greater disease impact (27).

The patients were asked to estimate their average pain intensity over the previous week using a visual analogue scale (VAS) consisting of a 10 cm line anchored by two verbal descriptors: "no pain" (0) on the left and "worst imaginable pain" (10) on the right side (28).

Psychological assessment

The presence of depressive symptoms was assessed using the Beck Depression Inventory – II (BDI-II), one of the most widely used self-rating scales for assessing the severity of depression (29, 30). Each item represents a "symptom-attitude type" and is answered using a four-point scale ranging from 0 (no symptom) to 3 (most severe). The total score is the sum of all the items, and ranges from 0 (minimal depression) to 63 (severe depression).

Anxiety was assessed using Form Y of the State-Trait Anxiety Inventory (STAI-Y) (31, 32), which is divided into two sections that can be used independently, each consisting of 20 items that are scored using a 4-point Likert-type scale: STAI-Y1 assesses current feelings of apprehension, tension, nervousness and worry (state anxiety), and STAI-Y2 evaluates persistent anxiety traits (trait anxiety). Each section has a total score ranging from 20 to 80, with higher scores indicating greater anxiety.

Psychosomatic assessment

The Diagnostic Criteria for Psychosomatic Research (DCPR) is a structured face-to-face interview consisting of 58 items with a dichotomous format (yes/no). It was developed to evaluate the presence of one or more of 12 'psychosomatic syndromes' covering the four main manifestations of abnormal illness behaviour (disease phobia, thanatopobia, health anxiety, and illness denial), four somatisation syndromes (persistent somatisation, functional somatic symptoms secondary to a psychiatric disorder, conversion symptoms, and anniversary reactions), two manifestations of irritability (irritable mood and type A behaviour), alexithymia and demoralisation (33, 34). The interview has excellent inter-rater reliability, construct validity, and predictive validity for psychosocial functioning and treatment outcomes (35).

Statistical analysis

The data were analysed using the v. 23 of the Statistical Package for the Social Sciences (SPSS-23; IBM SPSS Statistics for Macintosh, IBM Corp.,Armonk, NY, USA). On the basis of absolute skewness and kurtosis values of respectively <3.0 and <8.0 (36), all of the variables were normally distributed. Student *t*-tests for two independent samples and χ^2 tests were used to determine whether there were any differences in the clinical, demographic and psychological variables between the FM and RA patients, and Cohen's d was used to assess effect sizes. The Mann-Whitney U-test for independent samples was used to compare anxiety and depressive symptoms between the FM patients

with and without the 12 psychosomatic syndromes. *p*-values <0.05 were considered statistically significant.

Results

Socio-demographic variables

The socio-demographic characteristics of the two groups are shown in Table I. The groups were balanced in terms of age, years of education, and illness duration. The majority of the patients in both groups were married (55% in the FM group and 71% in the RA group) and currently employed (60% in the FM group and 50% in the RA group).

Clinical and pain variables

Table II shows the clinical and pain intensity data. As can be seen, the disease had a greater impact on the quality of life of the FM patients (FIQ-R), who indicated significantly higher total and subscale (physical functioning, overall impact and symptoms) scores ($p<0.001$).

The FM patients also indicated significantly higher mean pain intensity VAS scores (7.6±1.9 *vs* 4.2±2.6; $p<0.001$).

Psychological variables

The BDI and STAI-Y questionnaires (Table II) showed that the FM patients were more depressed and anxious than the RA patients ($p<0.001$). The FM patients had a mean BDI score of 20.1±9.5, indicating the presence of moderate depression, whereas the RA patients had a mean score of 11.3±8.6, indicating the absence of depression. The between-group difference in both of the STAI scales was statistically significant, with the FM patients indicating the higher mean scores than the RA patients ($p<0.001$).

Psychosomatic assessment

Table III shows the DCPR percentages and frequencies, and the results of the chi-squared tests used to look for possible statistically significant differences between the two groups in terms of the presence of the twelve psychosomatic syndromes. About one-fifth of the RA patients (21%) did not meet the criteria for any of the syndromes, whereas every FM patient presented at least one. More than half (57.9%) of the FM patients showed somatisation and demoralisation, a significantly higher percentage than that of the RA patients ($p<0.001$); the FM patients also had a significantly higher prevalence of disease phobia ($p=0.024$), illness denial ($p=0.001$), conversion symptoms ($p<0.001$), anniversary reaction ($p=0.002$), type A behaviour ($p=0.039$) and irritable mood ($p=0.006$). There was no statistically significant between-group difference in terms of alexithymia, health anxiety and thanatophobia (p-values always >0.05). The difference in the average mean

Table I. Socio-demographic variables. Mean values (±SD) or absolute numbers (percentages)*.

Variable		FM (n=76)	RA (n=80)	t test (df)	*p*
Age, years		50.3 (10.1)	53.3 (9.8)	1.889 (154)	0.061
Years of education		11.5 (3.3)	11.1 (3.5)	-0.628 (153)	0.531
Illness duration, months		118.0 (101.8)	144.5 (97.4)	1.593 (143)	0.113
Marital status					
	Single	10.8% (8)	12.5% (10)		
	Cohabiting	6.8% (5)	5% (4)		
	Married	55.4% (41)	71.3% (57)		
	Divorced	20.3% (15)	8.8% (7)		
Working status					
	Student	1.3% (1)	2.5% (2)		
	Employed	60% (45)	50% (40)		
	Housewife	16% (12)	17.5% (14)		
	Unemployed	20% (16)	10% (8)		
	Retired	9.3% (7)	13.3% (10)		

FM: fibromyalgia group; RA: rheumatoid arthritis group.

Table II. Clinical and psychological variables in the FM and RA groups. Mean values (± SD). Higher scores indicate a greater disease impact.

	FM (n=75)	RA (n=79)	T-test (df)	*p*	d
Total FIQ-R score	63.9 (18.2)	32.4 (20.3)	-10.12 (152)	**<0.001**	1.634
Physical Functioning	17.4 (6.9)	8.6 (7.1)	-7.80 (152)	**<0.001**	1.618
Overall Impact	12.2 (5.8)	6.1 (5.4)	-6.70 (152)	**<0.001**	1.080
Symptoms	34.3 (7.6)	17.7 (9.9)	-11.67 (145,08)	**<0.001**	1.866
Pain intensity (VAS)	7.6 (1.9)	4.2 (2.6)	-9.40 (143,83)	**<0.001**	1.510
Beck Depression Inventory	20.1 (9.5)	11.3 (8.6)	-6.02 (153)	**<0.001**	0.971
STAI-Y1	43.5 (12.6)	35.5 (10.0)	-8.02 (140.72)	**<0.001**	0.703
STAI-Y2	52.3 (11.7)	42.4 (9.5)	-9.88 (154)	**<0.001**	0.929

FM: fibromyalgia group; RA: rheumatoid arthritis group; FIQ-R: Revised Fibromyalgia Impact Questionnaire; VAS: visual analogue scale; STAI-Y: State-Trait Anxiety Inventory, Form Y.

Table III. Diagnostic Criteria for Psychosomatic Research (DCPR): percentages, (frequencies).

		FM (n=76)	AR (n=80)	χ^2	*p*
Abnormal illness behaviour	Health anxiety	10.5% (8)	13.8% (11)	0.38	0.538
	Disease phobia	9.2% (7)	1.3% (1)	5.08	**0.024**
	Thanatophobia	9.2% (7)	5.0% (4)	1.05	0.305
	Illness denial	42.1% (32)	17.5% (14)	11.35	**0.001**
Somatisation syndromes	Functional symptoms	5.3% (4)	0.0% (0)	4.32	**0.038**
	Persistent somatisation	57.9% (44)	10.0% (8)	40.23	**<0.001**
	Conversion symptoms	39.5% (30)	5.0% (4)	27.18	**<0.001**
	Anniversary reaction	38.2% (29)	16.3% (13)	9.51	**0.002**
Irritability	Type A behaviour	47.4% (36)	31.3% (25)	4.25	**0.039**
	Irritable mood	36.8% (28)	17.5% (14)	7.41	**0.006**
Demoralisation	Demoralisation	57.9% (44)	18.8% (15)	25.39	**<0.001**
Alexithymia	Alexithymia	38.2% (29)	31.3% (25)	0.82	0.365

FM: fibromyalgia group; RA: rheumatoid arthritis group. χ^2: frequencies.

Table IV. Mean ranks for anxiety and depressive symptoms between FM patients with and without each psychosomatic syndromes.

DCPR syndromes	STAI-Y2 (Mean rank) With	STAI-Y2 (Mean rank) Without	*p*	BDI-II (Mean rank) With	BDI-II (Mean rank) Without	*p*
Health anxiety	44.06	37.85	0.451	42.25	37.49	0.559
Disease phobia	49.07	37.43	0.183	55.50	36.20	**0.026**
Thanatophobia	65.07	35.80	**0.001**	56.57	36.09	**0.018**
Illness denial	42.20	35.81	0.212	41.42	35.59	0.254
Functional symptoms	56.25	37.51	0.103	61.13	36.70	**0.025**
Persistent somatisation	36.80	40.84	0.430	37.81	38.27	0.927
Conversion symptoms	44.18	33.79	0.070	44.32	33.79	0.054
Anniversary reaction	42.60	35.87	0.203	43.91	34.27	0.062
Type A behaviour	48.57	29.44	**<0.001**	44.00	32.46	**0.022**
Irritable mood	46.70	33.72	**0.013**	46.02	33.22	**0.014**
Demoralisation	47.89	25.59	**<0.001**	47.70	24.97	**<0.001**
Alexithymia	45.88	33.95	**0.022**	44.91	33.64	**0.029**

STAI-Y2: State-Trait Anxiety Inventory, Form Y; BDI-II: Beck Depression Inventory II; DCPR: Diagnostic Criteria for Psychosomatic Research.
Patients with and without psychosomatic symptoms were compared using Mann-Whitney U-tests for independent samples.

score of the FM and RA patients calculated by adding the number of psychosomatic syndromes (range 0–12) was statistically significant: 3.92±1.93 *vs* 1.68±1.64; $t(154) = -2.246$; $p<0.001$.

Anxiety and depressive symptoms in the FM patients with and without each psychosomatic syndrome

This comparison was only made in relation to the FM patients because these were the main focus of the study and there was a low prevalence of psychosomatic syndromes in the RA sample.

As shown in Table IV, anxiety scores were significantly higher among the FM patients with thanatofobia ($U=55$, $z=-3.343$, $p=0.001$), type A behaviour ($U=375$, $z=-3.774$, $p<0.001$), irritable mood ($U=442$, $z=-2.473$, $p=0.013$), demoralisation ($U=291$, $z=-4.348$, $p<0.001$) and alexithymia ($U=467$, $z=-2.290$, $p=0.022$) than among those without the psychosomatic syndrome.

The FM patients with disease phobia ($U=115$, $z=-2.233$, $p=0.026$), thanatofobia ($U=108$, $z=-2.370$, $p=0.018$), functional symptoms ($U=49$, $z=-2.183$, $p=0.025$), type A behaviour ($U=486$, $z=-2.292$, $p<0.022$), irritable mood ($U=433$, $z=-2.461$, $p=0.014$), demoralisation ($U=271$, $z=-4.470$, $p<0.001$) and alexithymia ($U=466$, $z=-2.183$, $p=0.029$) had significantly higher depressive symptom scores than those without the psychosomatic syndrome.

Discussion

The aim of this study was to compare the prevalence of psychosomatic syndromes, and anxiety and depressive symptoms, between FM patients and RA patients. A few studies have investigated somatisation in FM (22, 23) but, to the best of our knowledge, none has previously used the DCPR interview to investigate psychosomatic syndromes.

The findings revealed significant between group differences in pain intensity levels and all of the subscales of the FIQ-R: the FM patients reported higher levels of pain and the disease had a greater impact on their quality of life (higher scores for physical functioning, overall impact and symptomatology). This is in line with the findings of previous studies showing that FM causes more severe disabilities in every aspect of daily experience, including working productivity (17, 37-39). However, it needs to be remembered pain is a multidimensional construct and a VAS scale is a simple means of measuring pain intensity that is mainly subjective, and so it is difficult to interpret comparisons between populations with different disease, such as FM and RA (40).

The causal direction between pain and depression in FM is still unclear, but it is well known that depression is the most frequent psychiatric comorbidity in FM patients (13, 14). It has also been reported that the prevalence of anxiety and depression is higher than in the general population (41, 42), ranging from 20% to 70% in the case of depressive symptoms (43), and from 10% to 45% in the case of anxiety symptoms (44). Isik *et al*. investigated the prevalence of anxiety and depression in a case-control study of RA patients (42), and found a significantly greater presence of both symptomatologies in the patients than in the controls, with a negative correlation between disease duration and the Hamilton Anxiety Rating Scale, and a positive correlation between disease duration and depression.

Our results did not reveal the clinically relevant presence of psychological symptoms in the RA patients, but confirmed that anxiety and depression are more frequent and severe in FM patients than in RA patients.

Our study is the first to use the DCPR structured interview with FM and RA patients. The interview was developed in order to investigate the presence of twelve psychosomatic syndromes with the aim of suggesting a new diagnostic framework that would overcome the limitations of the classic diagnostic approach proposed by the Diagnostic and Statistical Manual of Mental Disorders (DSM) (45-47). Each of our FM patients had at least one of the twelve psychosomatic syndromes, whereas this was true of fewer than 80% of the RA patients.

The most frequent syndromes affecting the FM patients were those related to the area of somatisation: persistent somatisation, followed by conversion symptoms and anniversary reactions. These were observed in 38-58% of the FM patients but in only 5–16% of those with RA, a high prevalence that is possibly due to an inability to integrate emotional experiences cognitively and differentiate relevant from irrelevant somatic information. Demoralisation, type A behaviour and illness denial were the other psychosomatic syndromes most commonly present in our FM patients with percentages ranging between 42 and 58%. One-third of the patients in the RA group showed type A behaviour and alexithymia, whereas the prevalence of somatisation syndromes was significantly lower than in the FM patients.

These findings confirm our hypothesis that FM patients are characterised by more marked psychosomatic symptoms than patients with a similar chronically painful condition such as RA. However, psychological factors and somatisation are often blurred by the biological components of FM because FM patients grasp at biological explanations as they find it difficult to accept the psychological nature of their disease (48).

McBeth *et al*. have published a large population-based prospective study of the features of somatisation predicting the development of the chronic widespread pain (49), in which they found that illness behaviour (frequent visits to physicians to ask for treatment for somatic symptoms obstructing their daily routine) was a good predictor of the development of new chronic widespread pain within one year (46). They concluded that their results might support the hypothetical model of widespread chronic pain as a manifestation of the somatisation of stress. As somatisation and psychosomatic syndromes in general may be one of the consequences of emotional dysregulation probably due to traumatic and negative emotional experiences, future studies should take into account the role of a traumatic history in the onset of symptoms (50, 51).

Comparison of the psychological distress felt by the FM patients with and without each of the 12 psychosomatic syndromes investigated during the DCPR interview revealed high levels of anxiety and depression in the patients with psychosomatic manifestations. It can be argued that the high prevalence of psychosomatic symptoms found in our study explains the high levels of psychological distress because there is evidence suggesting a high rate of the co-occurrence of somatoform disorders and symptoms of anxiety and depression (52).

Taken together, our findings highlight the greater presence of psychological distress and psychosomatic syndromes in patients with FM than in those with RA. Patients with RA are aware of their disease, whereas FM patients often find it difficult to understand their syndrome, and are constantly looking for a medical explanation. This exhausting research may exacerbate their psychological symptoms and therefore worsen the psychosomatic manifestations of the chronic pain condition, thus creating a vicious cycle. A better understanding of these underlying mechanisms could allow clinicians to structure more specific and tailored interventions that take more account of the psychological dimension of the disease.

Study limitations

The cross-sectional design, small sample size, and self-reported measures are methodological limitations that should be considered when interpreting the results of the study. Further longitudinal and prospective studies of larger samples are needed in order to clarify the causal direction of the psychological components, and shed more light on the relationship between psychological distress and psychosomatic symptoms. Overlapping syndromes (FM and RA) should be also investigated, since FM can overlap RA in >20% of cases and influence disease outcomes (53, 54).

Authors' contributions

This study was designed by AG, LC and AB. The data were collected by AR, MDT, FC and EF; analysed by AG, VT and MDT, and interpreted by LC, RT and GCG. The paper was written by AG, VT and LC. All the authors read, discussed and approved the final version of the paper.

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