

## Better marital adjustment is associated with lower disease activity in early inflammatory arthritis

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**Aim:** The aim of this study was to examine the association between marital adjustment and disease outcomes in patients with early inflammatory arthritis.

**Materials and methods:** Patients with average disease duration of  $7.66 \pm 3.79$  months were recruited from a larger early inflammatory arthritis registry, which recorded sociodemographic data and disease characteristics. The acute phase reactant C-reactive protein (CRP) levels were measured and disease activity was estimated using the Disease Activity Score in 28 joints (DAS28). Patient and spouse perceived marital adjustment was assessed by the Dyadic Adjustment Scale (DAS).

**Results:** The study sample consisted of 73 patients living with their spouses. The mean age of the study participants was  $54.30 \pm 12.09$  years and 64.4% were female. Patient-perceived marital adjustment (DAS-Patient) was negatively correlated to CRP ( $P = 0.007$ ) and DAS28 ( $P = 0.002$ ). On multivariate analysis, DAS-Patient contributed to the dependent variable DAS28 after controlling for CRP.

**Conclusion:** The current study indicates that better marital adjustment is associated with lower disease activity. The possible reciprocal relationship between marital adjustment and illness highlights the relevance for clinicians to include both patients and their spouses in interventions.

**Key words:** Arthritis, marital adjustment, C-reactive protein, DAS28, disease activity

### Introduction

Inflammatory arthritis is a chronic condition characterized by persistent inflammation in multiple joints causing pain, disability, and poor quality of life. Marriage is one of the most influential relationships in adult life. While chronic illness has a profound effect on the marital relationship, the impact marriage can have on arthritis outcomes has been the subject of research interest and yielded a host of results. On one hand, marriage was associated with lower functional disability progression rate (1) and lower vulnerability

to the interpersonal stress-induced increase in disease activity (2), while, on the other hand, negative spouse behavior such as avoidance and criticism predicted worse pain outcome (3) and spouse depressive symptoms were found to be predictive of disability and disease activity (4) in persons with rheumatoid arthritis.

In an attempt to clarify this issue, the current study explored the marital relationship in relation to disease outcomes in the first 18 months of living with inflammatory arthritis. We hypothesized that

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it is not simply the marital status, married or single, that is relevant, but it is the quality of the spousal relationship that makes a difference. The specific characteristic of the couple's relationship, marital adjustment, was assessed and its association with disease indicators such as the acute phase reactant C-reactive protein (CRP) and the Disease Activity Score (DAS28) for the ill spouse was examined.

Because chronic illness strains both the ill partner and the spouse who is expected to provide care, we examined marital adjustment from both patient and spouse perspectives in order to better understand the overall experience.

We carried out our examinations in the very early stage of arthritis because this is the time during which illness behaviors and emotional reactions to illness are likely to become established and influence long-term adjustment.

## Materials and methods

### Sample

In the period between March 2006, when this study commenced, and May 2009, 257 patients were referred to the McGill Early Arthritis Registry (McEAR). Referrals to the McEAR come from 21 rheumatologists working in Montreal, Canada. The participating rheumatologists, each of whom works in a private office or outpatient hospital clinic, were asked to recruit all new early inflammatory arthritis patients who fit the inclusion criteria. Patients were included if they had newly diagnosed inflammatory arthritis, defined as 1 or more inflamed joints of a minimum duration of 6 weeks to a maximum duration of 18 months. Patients were 18 years or older, spoke English or French, and agreed to periodic physical and laboratory examinations as well as to completing questionnaires assessing demographics, disability, pain, and psychosocial factors related to their illness. Exclusion criteria included clinical evidence of remote joint damage suggestive of a previous episode of rheumatoid arthritis, any rheumatic diagnosis other than rheumatoid arthritis or undifferentiated inflammatory arthritis, severe functional limitation from a disease other than arthritis, and any disorder that compromised the ability to give informed consent.

All 257 patients were approached for participation in this particular study. A total of 104 patients (40.5% of the total McEAR participants) agreed to participate in psychosocial studies. Of those, 73 were living with a spouse and constitute the population of this study. A trained interviewer arranged to see the patient and caregiver at home within 10 days of the registry visit, obtained consent for the study, and assisted the participants in filling out the study-specific questionnaires. Patients received Can\$25 for each meeting with the study interviewer.

All patients in the registry signed an informed consent form and the study was approved by the Institutional Review Boards of McGill University and the Jewish General Hospital.

## Instrumentation

### Disease activity

Disease activity was measured by the DAS28, which is a composite measure including 28 of the American College of Rheumatology's joint count of 66 swollen joints and 68 tender joints, the acute phase reactant CRP, and the patient's global assessment of disease activity (5–8).

### Dyadic adjustment

Dyadic adjustment was assessed by the Dyadic Adjustment Scale (DAS) (9). Dyadic adjustment is a process defined by the degree of: 1) upsetting marital differences, 2) interpersonal tension and individual anxiety, 3) marital satisfaction, 4) dyadic cohesion, and 5) agreement on issues relevant to the marriage. The validity and reliability of the DAS have been tested in numerous studies and found to be satisfactory. The DAS has been identified among the best available indices in the measurement of marital quality and is widely used. Several abbreviated versions of the original 32-item instrument are now in use. Sharpley and Cross demonstrated that 6 items of the DAS may be used instead of 32 with almost equivalent results (10). The 6-item DAS is coded on interval scales ranging from 0 to 5. The total scale score can range from 0 to 30, with higher scores indicating better marital adjustment. In a previous study using the 6-item version, alphas for 101 patients and their wives ranged from 0.74 to 0.76, respectively (11).

Assessment of both the patient and the spouse took place in the home or another convenient location. At

the time of the home visit, the study was explained to the inflammatory arthritis patients and their spouses, and written consent was obtained. While one spouse was completing the self-report questionnaires, the other spouse was interviewed in another room. Having both patient and spouse occupied with their own interviews and self-report questionnaires in separate rooms reduced the likelihood of spouses influencing the other's responses and ensured privacy.

### Statistical analysis

Data were analyzed using SPSS 17. Descriptive statistics were used to summarize baseline characteristics of patients and their spouses. Means, standard deviations, or frequencies were calculated for all of the study variables. Independent samples t-tests were used to detect differences in DAS total scores by the dichotomous demographic study variables. Pearson correlations were used to calculate the association between the DAS scores of patients

and spouses with the continuous study variables. Linear regression analysis was used to examine the association between marital quality and disease activity after controlling for inflammation. All statistical tests were 2-tailed, and a P-value of 0.05 or less was considered significant.

### Results

The study sample consisted of 73 patients living with their spouses. The mean age of the study participants was  $54.30 \pm 12.09$  years, 64.4% were female, and 31.5% had children under the age of 18 years living at home. Approximately half of the patients were working with a total household income of more than \$60,000 per year. The sample was highly educated, with 54.8% having achieved college, university, or postgraduate education (see Table 1 for descriptive statistics of the sample).

Table 1. Descriptive statistics for study variables.

Variable	Mean $\pm$ SD	Frequency (%)
Age (years)	$54.30 \pm 12.09$	
Sex:		
Female		64.4%
Patient has children at home		31.5%
Patient is working		53.4%
Yearly income:		
<\$60,000		30.1%
$\geq$ \$60,000		49.3%
Refused to answer		20.5%
Education level:		
High school or less		43.8%
College or more		54.8%
Disease duration (months)	$7.66 \pm 3.79$	
Number of swollen joints	$8.69 \pm 9.81$	
Number of tender joints	$13.91 \pm 11.95$	
C-reactive protein (CRP) (mg/L)	$34.81 \pm 53.39$	
Disease Activity Score in 28 joints (DAS28)	$5.12 \pm 1.75$	
Patient using medication		76.7%
Dyadic Adjustment Scale (DAS)-Patient	$21.70 \pm 4.88$	
Dyadic Adjustment Scale (DAS)-Spouse	$22.15 \pm 4.82$	

Table 2 illustrates that the demographic variables of sex, having children under 18 years old in the same household, paid employment, yearly income, and education level did not affect patients' DAS or DAS28 scores. CRP was significantly lower among those with higher education but was not affected by any other demographic variables.

To find out whether dyadic adjustment as perceived both by the patient and the spouse was associated with illness outcome measures, we studied the correlation between marital satisfaction variables and illness variables, as shown in Table 3. Patient-perceived marital adjustment (DAS-Patient) was negatively correlated to the acute phase reactant CRP and to the DAS28 score. This means that the more adjusted the patient is in marriage, the less intense the inflammatory process and the disease activity are. Age and disease duration were not correlated with DAS-Patient.

Spouses' views about their marital adjustment significantly correlated with those of the patients. However, DAS-Spouse did not show an association with any of the disease outcomes measured.

Table 4 demonstrates the results of multiple linear regression analysis with the DAS28 score as the dependent variable and CRP and DAS-Patient as the independent variables. The overall model was significant with adjusted  $R^2 = 0.201$ ,  $F(df\ 2, 43) = 6.644$ ,  $P = 0.003$ . DAS-Patient was the independent variable significantly associated with DAS28 while CRP was not.

Table 5 shows the results of multiple linear regression analysis with the DAS-Patient score as the dependent variable and the CRP and DAS28 as the independent variables. The overall model was significant with adjusted  $R^2 = 0.239$ ,  $F(df\ 2, 43) = 8.085$ ,  $P = 0.001$ . Both CRP and DAS28 were significantly associated with DAS-Patient.

## Discussion

The goal of this study was to investigate marital quality from the perspective of both patients and spouses in the first 18 months of inflammatory arthritis and how it relates to illness activity in patients.

Our collection of data revealed that patients and spouses were in agreement, highly correlated,

Table 2. The t-test results between the Dyadic Adjustment Scale (DAS)-Patient scores and demographic study variables.

Variable	DAS Mean $\pm$ SD	P	CRP Mean $\pm$ SD	P	DAS28 Mean $\pm$ SD	P
<b>Sex:</b>						
Female	21.91 $\pm$ 5.13	0.642	29.95 $\pm$ 51.34	0.455	5.11 $\pm$ 1.89	0.987
Male	21.35 $\pm$ 4.48		41.52 $\pm$ 56.68		5.12 $\pm$ 1.56	
<b>Having children:</b>						
No	21.65 $\pm$ 4.94	0.885	38.30 $\pm$ 62.06	0.486	5.09 $\pm$ 1.74	0.868
Yes	21.83 $\pm$ 4.86		26.67 $\pm$ 22.82		5.19 $\pm$ 1.83	
<b>Working:</b>						
No	20.78 $\pm$ 4.35	0.150	52.35 $\pm$ 73.17	0.057	5.56 $\pm$ 1.60	0.151
Yes	22.46 $\pm$ 5.21		23.12 $\pm$ 30.90		4.81 $\pm$ 1.80	
<b>Yearly income:</b>						
<\$60,000	21.95 $\pm$ 5.32	0.699	31.99 $\pm$ 44.03	0.746	5.21 $\pm$ 1.85	0.328
$\geq$ \$60,000	22.42 $\pm$ 3.68		26.43 $\pm$ 47.37		4.61 $\pm$ 1.52	
<b>Education level:</b>						
High school or less	21.19 $\pm$ 6.13	0.394	55.22 $\pm$ 71.10	0.014	5.37 $\pm$ 1.74	0.336
College or more	22.21 $\pm$ 3.65		17.81 $\pm$ 20.63		4.87 $\pm$ 1.75	
<b>Using medication:</b>						
No	21.93 $\pm$ 4.68	0.835	40.08 $\pm$ 62.20	0.668	5.24 $\pm$ 1.89	0.782
Yes	21.63 $\pm$ 5.06		32.76 $\pm$ 50.39		5.07 $\pm$ 1.72	

Table 3. Pearson correlations for study variables.

Variable	Statistics	DAS-Spouse	Age	Disease duration (months)	CRP	DAS28
Dyadic Adjustment Scale (DAS)-Patient	r	0.512	-0.155	-0.071	-0.375	-0.451
	P	<0.001	0.197	0.554	0.007	0.002
Dyadic Adjustment Scale (DAS)-Spouse	r		-0.155	0.015	-0.185	-0.244
	P		0.267	0.914	0.272	0.152
Age	r			-0.027	0.271	0.028
	P			0.820	0.057	0.855
Disease duration (months)	r				-0.016	0.066
	P				0.915	0.663
C-reactive protein (CRP)	r					0.347
	P					0.018

Table 4. Multiple linear regression model for the Disease Activity Score in 28 joints (DAS28).

Dependent variable: DAS28						
Independent variables	B	SE B	t	P	95% Confidence interval for B	
					Lower bound	Upper bound
Constant	7.896	1.271	6.213	<0.001	5.333	10.459
C-reactive protein (CRP)	0.006	0.005	1.347	0.185	-0.003	0.015
Dyadic Adjustment Scale-Patient score	-0.137	0.054	-2.555	0.014	-0.246	-0.029

Adjusted R<sup>2</sup> = 0.201.

with respect to their impressions of marital quality. Greater patient satisfaction with the marital experience was accompanied by less inflammation and disease activity. Interestingly, marital adjustment was associated with disease activity after controlling for inflammation. This is in agreement with a recent study stating that being in a well-adjusted, nondistressed marriage leads to less pain and better functioning in adults with rheumatoid arthritis (12). Our study adds to this research in using more objective outcome measures such as CRP and the DAS28.

The limitations of this study, however, include a relatively small sample size, which restricted the complexity of the analyses; the cross-sectional nature of the study, which did not allow the determination

of causal relationships; and the use of self-report measures. Future longitudinal studies that clearly determine whether it is disease activity that affects marital relationship or vice versa are clearly needed.

Our study findings suggest that patients who have a better marital relationship experience less illness activity. It could be suggested that identifying specific aspects of the marriage experience that help illness outcomes might allow for the planning of specific intervention strategies. Clinicians could be encouraged to intervene with both patients and their spouses to improve the recovery experience. The ultimate goal of this line of research is to contribute to the health and quality of the lives of people with early inflammatory arthritis and their families by proposing a novel approach to treatment early in the

Table 5. Multiple linear regression model for the Dyadic Adjustment Scale (DAS)-Patient.

Independent variables	Dependent variable: DAS				95% Confidence interval for B	
	B	SE B	t	P	Lower bound	Upper bound
Constant	27.643	1.920	14.399	<0.001	23.771	31.514
C-reactive protein (CRP)	-0.024	0.012	-2.028	0.049	-0.048	<0.001
Disease Activity Score in 28 joints (DAS28)	-0.960	0.376	-2.555	0.014	-1.719	-0.202

Adjusted  $R^2 = 0.239$ .

course of illness. In fact, recent medical literature shows an increased interest in the influence that social factors such as marital adjustment (13) and social support (14) might have on chronic illnesses.

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