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Impairment of quality of life: rheumatoid arthritis versus sarcoidosis

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Abstract

Background: Quality of life (QOL) has become an important item in health care. QOL should be a major target of treatment in chronic diseases such as rheumatoid arthritis (RA) and sarcoidosis. The aim of this study was to compare the impact of RA and sarcoidosis on patients' QOL. We expected more serious impairment of QOL in the RA group than in the sarcoidosis group.

Methods: QOL was studied in RA patients ($n = 32$), sarcoidosis patients ($n = 37$), and a healthy control group ($n = 37$) employing the World Health Organization Quality of Life assessment instrument (WHOQOL-100).

Results: In both patient groups QOL was impaired with respect to Physical Health, Level of Independence ($P < 0.001$), and Overall QOL and General Health ($P < 0.01$). Moreover, RA patients appeared to have a lower QOL with respect to Pain and Discomfort ($P < 0.001$) and Mobility ($P < 0.001$).

Conclusions: In RA and sarcoidosis, fatigue and sleep were major problems. In contrast to our expectations, with respect to activities of daily living and working capacity, the two patient groups did not show any difference. Impairment of QOL was more serious and included more aspects of QOL in RA than in sarcoidosis. (**See Editorial p. 83.**)

Keywords: Sarcoidosis; Rheumatoid arthritis (RA); Quality of life; WHOQOL-100

Introduction

In the past two decades, assessment of health status and quality of life (QOL) as an outcome measure has become increasingly important in patients with chronic diseases, including rheumatoid arthritis (RA) [1–5]. Improvement of patients' QOL has become a major target of treatment. In general, health status and QOL of RA patients are substantially impaired, whereas disease status as assessed by disease related variables does not reflect accurately the impact of the disease on psychological and social well-being [4,6]. In sarcoidosis, health status and

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QOL have had little attention. Recently, we found impairment of health status and QOL in sarcoidosis patients [7,8]. No relationship of routinely performed pulmonary function tests and serum angiotensin converting enzyme (sACE) with health status and QOL was found [7,8].

Sarcoidosis and rheumatoid arthritis (RA) have several sequelae in common. Both are inflammatory disorders of unknown etiology. In both disorders the mode of onset is variable and they both regularly occur in relatively young people. The clinical course in both disorders is rather unpredictable, ranging from spontaneous remission to rapid progression or a more chronic course. Some immunologic disturbance is thought to play a central role in the pathogenesis of sarcoidosis [9] as well as in RA [10]. Manifestations of RA are primarily in the joints, but systemic symptoms and extra-articular inflammation may be present as well. In RA, as in sarcoidosis, pulmonary involvement with interstitial pneumonitis or fibrosis, however only occasionally, may occur [11,12]. In sarcoidosis, symptoms vary considerably depending on the organ involvement. Patients with sarcoidosis may present with aspecific symptoms also present in RA such as fatigue, arthralgia, and muscle pain. In a previous study, we found that in about 5% of patients with sarcoidosis, the symptoms were initially attributed to a RA [13]. Finally, in both disorders no specific causal treatment is known at present.

In rheumatology a number of health status measures have been used to assess QOL [4]. Recently, Ruta et al. validated the SF-36, a generic health status measure, in RA patients [14]. However, usually, disease impact of RA on patients' lives has been assessed rather by disease-specific health status measures [5,15–17] than by subjective QOL measures. Health status measures assess mainly functional status, whereas QOL instruments assess the individuals' subjective perception of their life. When using health status measures, it would be a mistake to equate lower levels of functioning with lower QOL. For this conclusion would contrast with findings in QOL research reflecting high perceived QOL in spite of low levels of functioning [18].

To the best of our knowledge, there exist no comparative studies on QOL in RA and other chronic inflammatory disorders such as sarcoidosis. Therefore, the aim of this study was to compare the impact on QOL of RA and sarcoidosis. Recently, we showed that QOL in symptomatic sarcoidosis patients was more seriously impaired than QOL in patients without current symptoms [8]. We hypothesized that QOL would be impaired in RA as well as sarcoidosis compared to healthy controls. Sarcoidosis patients were expected to have better QOL than RA patients. Especially with respect to pain and levels of independence we expected a more serious impairment of QOL in the RA patients. With respect to fatigue no difference between the patient groups was expected. Therefore, in the present study QOL in active RA was compared with QOL of symptomatic sarcoidosis patients. For this purpose a broad-ranging generic QOL instrument, the World Health Organization Quality of Life assessment instrument (WHOQOL-100) [19], was used.

Materials and methods

Patients

A group of RA patients ($n = 35$) was recruited aselectively from consecutive patients with RA not in remission visiting the Outpatient Department of Rheumatology, Rijnstate Hospital, Arnhem. When asked to participate in the study, three patients refused for various reasons, whereas 32 patients agreed to participate in the study. None of those latter patients had any co-morbidity. The diagnosis of RA was based on the American College of Rheumatology (formerly the American Rheumatism Association) criteria for RA [20]. The patients were clinically assessed by a rheumatologist, who completed a questionnaire with the clinical characteristics: disease duration, functional class according to Steinbrocker [21], current serum markers (erythrocyte sedimentation rate (ERS) and C-reactive protein (CRP)), 28 swollen joint index, and current medication. At the same visit the patient completed the WHOQOL-100 [19].

The sarcoidosis patient group was recruited from eight Dutch hospitals (Rijnstate Hospital, Arnhem; Academic Hospital St Radboud, Nijmegen; Rehabilitation Center Dekkerswald, Nijmegen; District Hospital Middle Twente, Hengelo; St. Jans-Hospital,

Weert; Maasland Hospital, Sittard; The Wever Hospital, Heerlen; and University Hospital, Maastricht). Seventy-one unselected consecutive out-patients with sarcoidosis, without any co-morbidity were contacted. Seven sarcoidosis patients declined for various reasons, but 64 agreed to participate. The diagnosis of sarcoidosis was based on clinical findings, along with histological evidence. None of the patients had any previous medical condition which might have influenced their QOL. All patients completed the WHOQOL-100. In addition, the physician asked them whether they had any of the following complaints: fatigue, dyspnea, coughing, arthralgia, or erythema nodosum. Twenty-seven out of the 64 studied sarcoidosis patients reported no actual symptoms, whereas 37 patients appeared to suffer from one or more symptom(s). In order to be able to compare the impact of symptoms between sarcoidosis patients and the studied RA patients, who were not in remission, only sarcoidosis patients with current symptoms related to their disorder ($n = 37$) were included in the present study. Using the patient record, the values of serum angiotensin converting enzyme (sACE) levels and the pulmonary function tests were obtained from the visit closest to the session in which the questionnaires were completed.

Furthermore, 240 control persons were recruited who were willing to participate in a study on QOL. From the group of persons who returned a completed test-booklet ($n = 178$; 74.2%), healthy control subjects ($n = 37$) were selected on the basis of gender and age, matched for the sarcoidosis patients. For demographical characteristics of the two patient groups and the control group see Table 1.

The characteristics of the RA patients are summarized in Table 2. During the previous week five of the RA patients had received systemic corticosteroids; all these patients received prednisolone. One patient was treated with 7.5 mg/day, two with 10 mg/day, one with 15 mg/day, and of one patient information on the dose was missing. Only one patient did not receive disease modifying anti-rheumatic drugs (DMARDs) at the time of the study. Ten patients were currently treated with Methothrexate, nine with Sulphasalazine, four with Azathioprine, three with Penicillamine, two with Hydroxychloroquine, one with Auromyosis, and one patient received the combination Sulphasalazine and Metothrexate at the time of the study.

Table 2
Characteristics of the RA patient group

Variable	
Disease duration, years[a]	8.4 (9.3)
Type RA seropositive/seronegative	26/4
Steinbrocker I/II/III/IV	9/22/1/0
28 swollen joint index[a]	8.3 (8.0)
CRP[a]	25.9 (34.2)
ESR[a]	33.7 (25.8)
Corticosteroid use yes/no	5/27
Present treatment with DMARDs yes/no	31/1
Number of DMARDs in the past[a]	2.2 (2.3)

[a] Data are means (SD); CRP = C-reactive protein, normal levels < 9 U/l; ESR = erythrocyte sedimentation rate; DMARDs = disease modifying anti-rheumatic drugs.

The characteristics of the sarcoidosis patients are summarized in Table 3. The sarcoidosis patients

Table 3
Characteristics of the sarcoidosis patient group

Variable	
Disease duration[a]	4.4 (5.1)
FEV_1 (normal/decreased)	29/8
$T_{L,CO}$ (normal/decreased)	22/15
sACE U/l (9–25 U/l)[a]	30 (25)
Use of corticosteroids (yes/no)	14/23

[a] Data are means (SD); FEV_1 = forced expiratory volume in one second; $T_{L,CO}$ = transfer factor of the lung for carbon monoxide; sACE = serum angiotensin converting enzyme.

Table 1
Characteristics of the studied sarcoidosis patients, rheumatoid arthritis (RA) patients, and the healthy control group

Variable	RA patients	Sarcoidosis patients	Control group
Number	32	37	37
Age, year[a]	54.3 (29–70)	45.3 (26–73)	45.4 (26–73)
Gender male/female	13/19	21/16	21/16

[a] Data are means with the range in parentheses.

reported the following symptoms: fatigue in 28, dyspnea in 15, arthralgia in 11, cough in six patients, and erythema nodosum in one patient. With respect to the pulmonary function tests, eight of the sarcoidosis patients (21.6%) showed a mildly decreased forced expiration volume in one second (FEV_1), and 15 patients showed a decreased transfer factor of the lung for carbon monoxide ($T_{L,CO}$). In 12 of the patients the $T_{L,CO}$ was mildly decreased and in three patients it was moderately decreased, according to the American Medical Association classes.

Questionnaire

Both patient groups and the healthy controls completed the World Health Organization Quality of Life assessment instrument, WHOQOL-100, (Dutch version) [19]. This is a cross-culturally developed generic multidimensional QOL measure that has been simultaneously developed in 15 centres around the world, e.g. in France, Russia, USA, Panama, Zimbabwe, Japan, Thailand, and The Netherlands [22]. It consists of 100 items assessing 24 facets of QOL within six domains (Physical Health, Psychological Health, Level of Independence, Social Relationships, Environment, and Spirituality/Religion/Personal Beliefs) and a general evaluative facet (Overall Quality of Life and General Health). Each facet is represented by four items. The response scale is a 5-point Likert scale, scores can range from 4 to 20. Except for the facets Pain and Discomfort, Negative Feelings, and Dependence on Medication and Treatment, higher scores mean a better QOL. The reliability and validity of the Dutch version of the instrument are high [19,23].

Pulmonary function tests

Pulmonary function measurements of the sarcoidosis patients included the FEV_1 (Compactbody, Jaeger, Würzburg, Germany). The best measure of three efforts was selected. All volumes are expressed as percentages of the reference values [24]. The $T_{L,CO}$ was measured using the single breath method (Masterlab, Jaeger, Würzburg, Germany). Four ranges of FEV_1 and $T_{L,CO}$ levels were classified according to the American Medical Association classes: (1) normal ($>80\%$); (2) mild decrease (60–80%); (3) moderate decrease (40–60%); (4) severe decrease ($<40\%$), of the values predicted.

Statistical methods

Data are expressed as mean (SD) and, if appropriate, as mean with range. Statistical differences in age and gender between patient groups were studied using Student's t-tests and χ^2-tests. Pearson correlation coefficients were used. Significance was accepted with P-values <0.05. Furthermore, data were analyzed using analysis of variance (ANOVA) with age and gender as covariates between groups. Within the RA group one-way analyses of variance were used. In ANOVA, significance was accepted with P-values <0.01 due to the number of analyses. All analyses were performed using the Statistical Package for Social Science (SPSS) for Windows [25].

Results

The RA patients were significantly older than the sarcoidosis patients ($P<0.001$). Table 4 summarizes the QOL scores for domains and facets with significant differences between the groups. Impairment was found with respect to the evaluative facet Overall QOL and General Health, the domains Physical Health and its facets, as well as the domain Level of Independence and its facets, for both patient groups.

The facets Overall QOL and General Health ($F=7.4$; $df=2$, $P<0.01$), Energy and Fatigue ($F=16.5$; $df=2$, $P<0.001$), Sleep and Rest ($F=9.8$; $df=2$, $P<0.001$), Activities of Daily Living ($F=18.1$; $df=2$, $P<0.001$), and Working Capacity ($F=18.5$; $df=2$, $P<0.001$) were low in the two patient groups compared to the healthy controls.

In the domains Physical Health ($F=18.1$; $df=2$, $P<0.001$) as well as Level of Independence ($F=26.6$; $df=2$, $P<0.001$) and its facet Dependence on Medication or Treatment ($F=41.2$; $df=2$, $P<0.001$) all three groups scored significantly different from each other, the healthy controls having the highest QOL in these areas and the RA group the lowest. Furthermore, the group of RA patients scored worse on the facets Pain and Discomfort ($F=16.1$; $df=2$, $P<0.001$) and Mobility ($F=6.9$; $df=2$,

Table 4
WHOQOL-100 domain and facet scores with significant differences between the rheumatoid arthritis (RA) patients, the sarcoidosis patients, and the matched control group[a]

WHOQOL-100	RA group	Sarcoidosis group	Control group
Overall Quality of Life and General Health[b,f]	13.6 (2.5)	14.2 (3.7)	16.2 (2.3)
Physical Health[c,e]	12.3 (2.6)	14.3 (2.8)	16.1 (1.7)
Pain and Discomfort[d,e]	12.9 (2.7)	9.2 (3.1)	9.1 (2.8)
Energy and Fatigue[b,e]	11.7 (3.6)	12.2 (3.7)	15.8 (2.0)
Sleep and Rest[b,e]	14.0 (3.7)	14.8 (3.8)	17.4 (2.5)
Level of Independence[c,e]	12.1 (2.9)	13.9 (3.3)	17.4 (2.3)
Mobility[d,f]	13.6 (2.5)	15.5 (3.4)	17.2 (3.3)
Activities of Daily Living[b,e]	12.8 (3.5)	13.4 (3.7)	17.2 (2.1)
Dependence on Medication or Treatments[c,e]	13.8 (3.0)	10.0 (4.2)	5.7 (2.7)
Working Capacity[b,e]	12.1 (3.5)	12.8 (4.2)	17.0 (2.9)

[a] Analysis of variance (covariates age); scores are means (SD).
[b] Control group scored differently from the two patient groups.
[c] All three groups scored differently from each other.
[d] RA group scored differently from the two other groups.
[e] $P < 0.001$.
[f] $P < 0.01$. Note: domains are printed in bold; for the facets Pain and Discomfort and Dependence on Medication or Treatment higher scores mean worse QOL.

$P < 0.01$) than the sarcoidosis patients and the healthy group.

For the RA patients we found a significant correlation between the evaluative facet Overall QOL and General Health and the facet Pain and Discomfort ($r = -0.65$, $P < 0.001$). Moreover, a relationship was found between the facet Energy and Fatigue and the facet Pain and Discomfort ($r = -0.69$, $P < 0.001$). (Note, that for the facet Pain and Discomfort, in contrast to most other facets, higher scores mean a worse QOL). No relationship was found for the facet Pain and Discomfort with Sleep and Rest and between the facets Energy and Fatigue and Sleep and Rest. Although the RA patients did not show an impairment of their psychological health, the facet Energy and Fatigue was related to the domain Psychological Health of the WHOQOL-100 ($r = 0.75$, $P < 0.001$). For the sarcoidosis patients no such relationship was found.

For the RA patients, several relationships were found between the physiological measures of disease severity and QOL. On the domain level, a relationship was found between Physical Health and the ESR ($r = -0.50$, $P < 0.01$), Level of Independence and number of courses with DMARDs ($r = -0.35$, $P = 0.05$), and between Environment ($r = -0.42$, $P < 0.05$) as well as Spirituality/Religion/Personal Beliefs ($r = -0.41$, $P < 0.05$) and the doses of systemic corticosteroids.

On the facet level, Energy and Fatigue correlated with the number of courses with DMARDs in the past ($r = -0.50$, $P < 0.01$), and the doses of systemic corticosteroids ($r = -0.39$, $P < 0.05$). Moreover, RA patients with elevated CRP levels showed even lower scores for Energy and Fatigue ($t = 2.95$, $df = 12$, $P = 0.012$) than those with normal CRP. The facet Sleep and Rest correlated with the ESR ($r = -0.54$. $P < 0.001$). The facets Thinking, Learning, Memory, and Concentration and Bodily Image and Appearance were related to the swollen joint index ($r = -0.39$, $P < 0.05$ and $r = -0.40$, $P < 0.05$, respectively). Mobility correlated with the ESR ($r = -0.48$, $P < 0.01$). Moreover, a relationship was found between Activities of Daily Living and the number of courses of DMARDs ($r = -0.40$, $P < 0.05$). The QOL facets Ability to Acquire New Information and Skills was related to the number of courses with DMARDs ($r = -0.41$, $P < 0.05$) and the doses of systemic corticosteroids ($r = -0.47$, $P < 0.01$). No relationships were found between the QOL facet Pain and Discomfort and any of the physiological measures of disease severity. In addi-

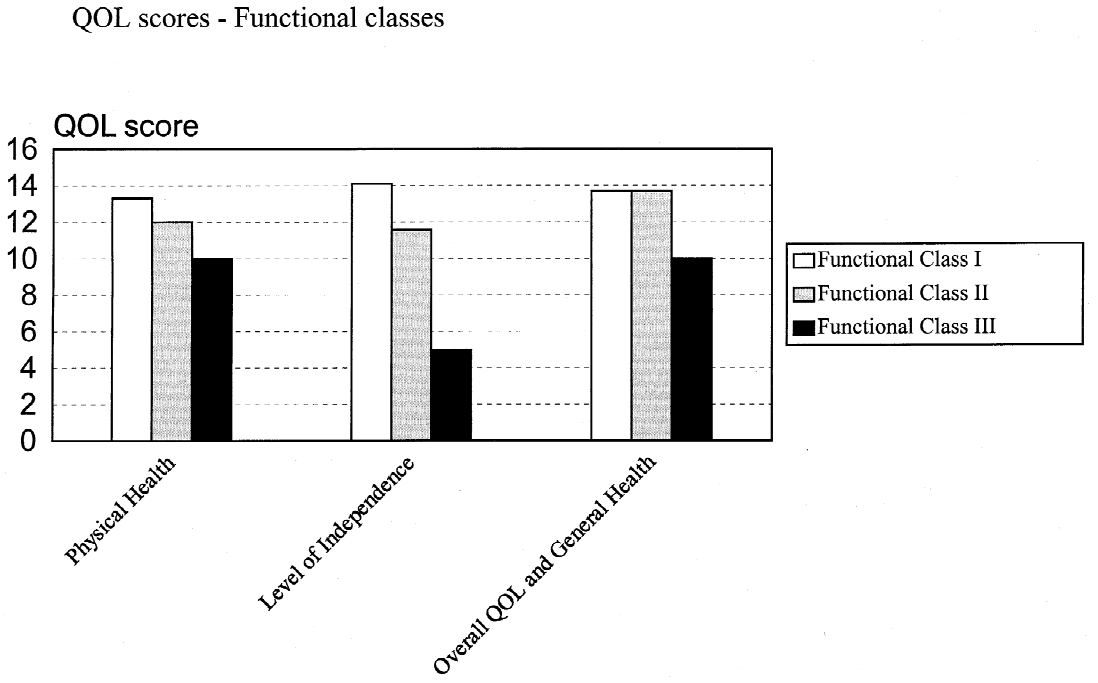

Fig. 1. Relationships between functional classes and the domains Physical Health, Level of Independence, and Overall QOL and General Health.

tion, no relationship was found between gender, duration of the disease, and the current medication with DMARDs and patients' QOL. Fig. 1 shows the relationship between the functional class and the domains Physical Health, Level of Independence, and the evaluative facet Overall Quality of Life and General Health. In Fig. 2., the relationship between the facets of these two domains and the functional class is illustrated.

The domain Psychological Health ($F = 5.4$, df = 2; $P < 0.05$), and its facets Self-Esteem ($F = 9.0$, df = 2; $P < 0.001$) and Negative Feelings ($F = 7.5$, df = 2; $P < 0.01$) were related to positivity of the rheumatoid factor (RF). Scores for both facets were higher in patients with positivity for RF than in those with a positivity for APF or seronegativity for RF, indicating that patients with a positive RF had a better psychological health, more self-esteem, and less negative feelings.

For the sarcoidosis patients, no relationships were found between physiological measures, that is sACE levels as well as pulmonary function tests, and QOL.

Discussion

Generally, parameters of disease activity or progression in RA are measured by the disease activity score (DAS). The DAS has shortcomings with respect to the subjective feeling the RA patient has. In this study, we compared quality of life (QOL) in RA with QOL in sarcoidosis using the WHOQOL-100. The results showed that compared with healthy control subjects, QOL was impaired in both RA patients and sarcoidosis patients in many aspects of daily life. Compared to sarcoidosis patients, the impairment of QOL in RA patients was more severe and included more aspects of daily life.

Both patient groups felt anergic and suffered from fatigue. Recurrent or persistent fatigue is a feature of many acute or chronic inflammatory conditions. Fatigue is generally recognized as a subjective feature in RA not being in clinical remission [26]. Crosby found in a patient group with RA that more than 50% of patients suffered from fatigue and constant lack of energy [27]. Furthermore, in another

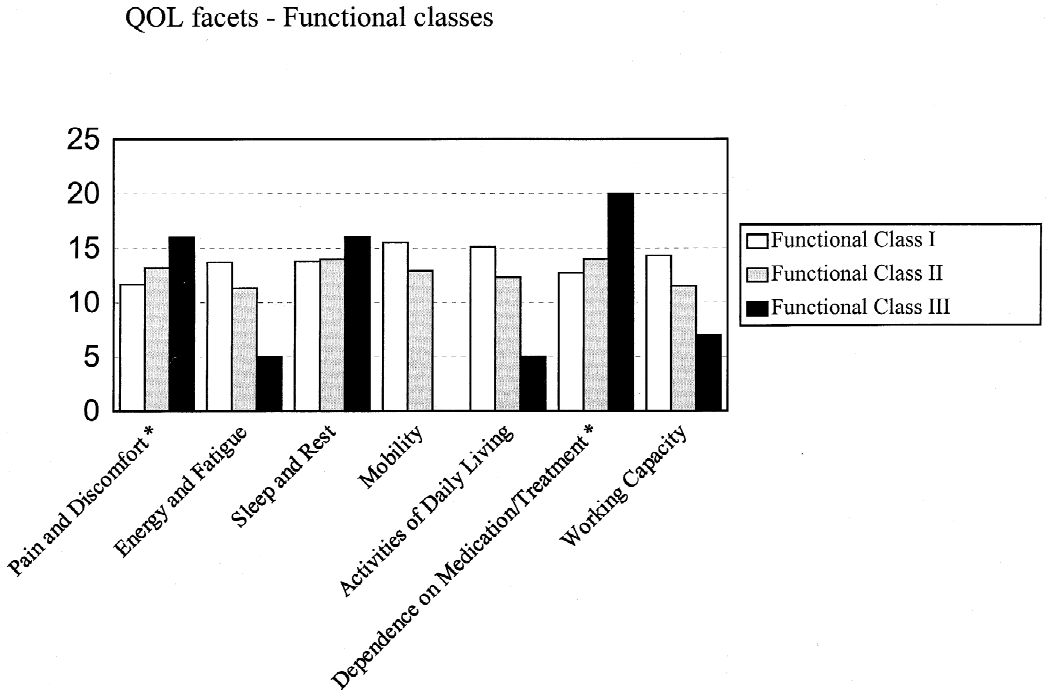

Fig. 2. Relationships between functional classes and the facets of the domains Physical Health and Level of Independence.

study she demonstrated a correlation of pain, fragmented sleep, and functional ability with fatigue in RA patients [28]. In the present study, pain and fatigue were interrelated in the RA patients. However, no interrelationships of pain and fatigue with sleep were found, although all three aspects were significantly impaired. In sarcoidosis, the symptom fatigue has received little attention in literature [29]. Recently, we found lower levels of energy and more fatigue in a group of sarcoidosis patients compared to healthy controls. This finding was not associated with current symptoms; it appeared to be present also in patients who initially had reported no symptoms [8]. In another study, we found besides reduced respiratory muscle strength and respiratory muscle endurance, an interrelationship between the symptom fatigue and decreased expiratory muscle strength [30].

RA can have a negative effect on affective, behavioral, and social functioning of patients [31]. Studying psychological stressors in RA, others have found, that patients with RA have to cope simultaneously with pain, limitations and dependence and that all three factors were negatively related to QOL [32]. Moreover, depressive symptoms are more frequent in patients with RA than in healthy controls, even after controlling for criterion contamination [31,33]. In the present study, the RA patients as a group were not impaired with respect to their psychological health. However, patients with lower levels of energy showed more impairment of their psychological health. In rheumatology research, the negative affect component of QOL has been emphasized [31]. In the present study, RA patients did not have more negative feelings than sarcoidosis patients and healthy controls. However, patients with seropositivity for rheumatoid factor (RF) showed better psychological health, less negative feelings, and a better self-esteem compared with positivity for APF. Fewer psychopathological tendencies in patients with positivity for RF than in those with seronegativity for RF have been reported before [34].

Also the sarcoidosis patients included in this study were not impaired in their psychological health. We found no relationship between psychological health and fatigue. With respect to depressive symptoms in sarcoidosis patients, we found in a previous study that patients with current symptoms experienced more depressive symptoms than asymptomatic patients [7].

In the present study, the QOL in both patient groups was impaired mainly with respect to aspects of physical health and level of independence, as well as general health and overall QOL. As discussed above, with respect to fatigue and sleeping problems, the two patient groups did not differ significantly from each other. Also difficulties performing activities of daily living and work were equally impaired in both patient groups. In addition, the RA patients were impaired in their mobility. Also pain and discomfort appeared to be a major problem only in RA patients. This could be expected, as chronic and acute pain is known to be the major consequence of this disorder [31,32]. Surprisingly, no relationship was found between the levels of pain of RA patients assessed by the WHOQOL-100 and any of the physiological measures of disease severity. In contrast, Meenan et al. found for the AIMS pain scale relationships with criteria of disease severity such as joint count [35]. However, the AIMS is a health status measure and the questions are closer related to objective measures than the WHOQOL-100 items. The questions of the latter assess, e.g. to what extent the patient has 'difficulties to cope with pain or discomfort', 'worries about pain or discomfort', and measure the 'extent that pain keeps you from doing what you must do'. These questions assess rather the patient's subjective perception. The impairment the patient perceives by the pain is not necessarily related to measures such as functional status or swollen joint count.

RA patients with elevated CRP levels had low levels of energy and more fatigue. This is in line with other studies, in which improvement of fatigue coincided with a descend of CRP levels after treatment [36]. Previously, we found a relationship between fatigue and CRP levels for sarcoidosis patients as well [37]. Moreover, we found that in sarcoidosis patients, the symptom fatigue is assessed more accurately by the WHOQOL-100 than by only asking patients, whether they have complaints [8]. The WHOQOL-100 facet Energy and Fatigue appears to be sensitive for the assessment of fatigue in RA patients as well.

Physiological measures such as ESR and the current medication as well as medication in the past were related to only a few aspects of QOL. As discussed above, elevated CRP levels correlated with patients' pain and discomfort. No relationship was found between duration of the disease and QOL. In general, non-significant correlations were found between QOL and the routinely performed physiological measures. These results are in line with other studies that have shown that disease status in RA, assessed by the routinely performed measures of physical health, did not reflect the impact of RA on psychosocial well-being [38]. Self-reported low physical well-being, however, was associated with more depressive feelings [6]. Other subjective stressors such as perceived limitation and dependence were found only weakly related to traditionally used disease status measures [32].

For the sarcoidosis patients no relationship between pulmonary function tests such as FEV_1 and $T_{L,CO}$ and the WHOQOL-100 scores were found. Also health status was not related to duration of the disease and routinely performed tests such as pulmonary function tests and serum angiotensin converting enzyme (sACE) levels, respectively, as we showed in a previous study [7]. However, as mentioned above, fatigue was found related to higher levels of CRP in sarcoidosis patients [37]. Although the impairment of QOL was more severe in the RA patients, QOL was considerably impaired in the sarcoidosis patients as well. When only considering the pulmonary function tests, one would expect only mild impairment of QOL in these sarcoidosis patients, as these tests were normal in most patients, or showed only mild impairment.

The present study has a couple of limitations. Disease severity as assessed by the different, routinely performed physiological measures for both disorders are not directly comparable. Moreover, the disease duration of the RA patients was longer than that of the sarcoidosis patients. Although one may hypothesize that duration of the disease influences QOL, this was clearly not the case in both patient groups. In addition, the RA patients were signifi-

cantly older than the sarcoidosis patients. This difference between the patient groups did not influence the results, as age was used as covariate in the analyses.

In conclusion, QOL is impaired in both RA as well as in sarcoidosis. As hypothesized, QOL was more seriously impaired and included more aspects of QOL in RA patients than in sarcoidosis patients. Main problems for both patient groups were sleeping problems and fatigue. As expected, pain and impaired mobility were found only in the RA patients. However, in contrast to our expectations, with respect to their working capacity and problems performing activities of daily living the two patient groups did not show any differences. Although the disease impact on the quality of life was more severe in the RA patients, the impact of the disease on symptomatic sarcoidosis patients was considerable. This study indicated that QOL indeed is partly related to physiological measures of disease severity in RA, but not at all in sarcoidosis. Thus, in RA, as in other chronic diseases such as sarcoidosis, assessment of QOL is of additional value and, therefore, should be included in the follow-up for a broad evaluation of the patients' clinical situation. The WHOQOL-100 appeared to be an appropriate instrument to assess QOL in both diseases studied.

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