

TYPE D OR 'DISTRESSED' PERSONALITY IN SARCOIDOSIS AND IDIOPATHIC PULMONARY FIBROSIS

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ABSTRACT. *Background:* Personality factors have shown to be related to mortality, morbidity, and psychological aspects in chronic disorders. Little is known about the effect of personality on disease severity in sarcoidosis and idiopathic pulmonary fibrosis (IPF). The aim of this study was to assess the prevalence of Type D personality and its relation with relevant clinical characteristics in sarcoidosis and IPF patients. *Methods:* The study included 441 sarcoidosis and 49 IPF patients from the outpatient clinic of the ild care team of the MUMC, the Netherlands. They completed the DS14 (Type D questionnaire), the fatigue assessment scale (FAS), the WHO quality of life-BREF (WHOQOL-BREF) and the Centre for Epidemiological Studies-Depression Scale (CES-D). Moreover, relevant clinical data were collected. The control group consisted of 3678 subjects from a general population. *Results:* Type D personality was found in 25.6% of the sarcoidosis patients compared to 21% in the controls, but only in 18.8% of the IPF patients. No relation with disease severity was found in either of these disorders. Fatigue was a substantial problem in both populations. Depressive symptoms but not Type D personality predicted fatigue and poorer QOL in sarcoidosis and IPF. *Conclusion:* Prevalence of Type D personality is not higher in sarcoidosis and IPF patients than in the general population and does not explain QOL impairment. Depressive symptoms explain QOL impairment and fatigue substantially. Therefore, in the multidisciplinary management of sarcoidosis and IPF psychological screening and psychological counselling concerning adequate coping strategies should be incorporated. (*Sarcoidosis Vasc Diffuse Lung Dis* 2011; 28: 65-71)

KEY WORDS: depression, D-Personality, fatigue, idiopathic pulmonary fibrosis, quality of life, sarcoidosis

INTRODUCTION

Many studies have demonstrated the role of psychosocial and behavioural risk factors in the aetiology, pathogenesis, and course of chronic disorders.

Personality factors have shown to be related to mortality, morbidity, psychological aspects, and quality of life (QOL) in chronic disorders. In 2000 a new personality construct, the type D or 'distressed' personality was introduced (1). The type D personality construct was developed by Denollet in a population of men with coronary heart disease. A type D personality has the tendency to simultaneously experience negative emotions (negative affectivity NA) and to inhibit the expression of these emotions in social interaction (social inhibition SI). Type D individuals generally have fewer personal connections with other individuals and experience discomfort when being with strangers. Individuals scoring high

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on negative affectivity often have a depressed mood and feelings of frustration, fear, anxiety, stress, uncertainty, isolation, hopelessness, anger and hostility. Furthermore, they have a low level of self-esteem and more somatic symptoms (1). Type D individuals perceive their environment as socially unsupportive. In heart failure patients the prevalence of Type D was reported to be around 30% (1, 2). Type D personality has been recognized as an important predictor of morbidity, mortality, and QOL in cardiovascular diseases (3-6). Moreover, it was shown in patients with chronic pain, asthma, tinnitus, and sleep apnea (7).

Chronic disorders such as sarcoidosis and idiopathic pulmonary fibrosis (IPF) can have a significant and serious negative impact upon patients' overall QOL (8-12). Moreover, QOL has become an important endpoint of treatment (13-15). QOL refers to patients' evaluation of their functioning in a range of domains, such as physical, psychological, and social functioning (9, 10, 16). Little is known about the role of personality on the clinical presentation and disease course in both disorders (17-19).

Therefore, the aim of this study was to assess the prevalence of type D-personality in sarcoidosis and IPF. Moreover, the relationship of type D-personality with fatigue, depressive symptoms, quality of life (QOL), and clinical parameters has been studied.

MATERIAL AND METHODS

Patients and controls

Sarcoidosis patients (n=588) and IPF patients (n=68) known by the ild care team of the outpatient clinic of the department of Respiratory Medicine of the Maastricht University Medical Centre (MUMC), the Netherlands were sent a set of questionnaires in November 2007. The patients who returned complete questionnaires, 75% (441/588) sarcoidosis patients and 72.1% (49/68) IPF patients were included. The exclusion criteria were poor expression in the Dutch language (n=6) and relevant co morbidity, such as a malignancy (n=5), dementia (n=1), and a history of psychiatric illness (n=3). The diagnosis sarcoidosis was based on consistent clinical features and BAL fluid analysis results, according to

the WASOG guidelines (20). A biopsy was available in 80% of the cases. The diagnosis IPF was based on consistent clinical features, together with HRCT findings classical for IPF, including presence of honeycombing and reticular opacities (21). In 34 cases a biopsy was available. These biopsies were consistent with histological characteristics of UIP (usual interstitial pneumonia) according to the ATS guidelines (21, 22).

The study was performed in accordance with the Declaration of Helsinki and its amendments. The protocol was approved by the local Medical Ethics Board of the University Hospital Maastricht. Written informed consent for participation in this study was obtained from all patients.

Measures

Clinical data

Relevant demographic and clinical data were obtained from the patients' medical files. Lung function measurements, including forced expiratory volume in one second (FEV₁), and forced vital capacity (FVC), were measured with a pneumotachograph. Values were expressed as a percentage of those predicted.

Six-Minute Walk Test (6MWT)

The maximal walking distance in a period of six minutes will be measured in a standardised way, adapted from the American Thoracic Society (ATS) guideline (23).

Questionnaires

Type D personality

The Distressed Scale-14 (DS-14) measures Type D personality, using 14 questions (24). It is a brief measure with little burden to patients. The DS-14 has good psychometric properties. The scale consists of two subscales, a 7-item negative affect (NA; the tendency to experience negative emotions such as feelings of dysphoria, anxiety, and irritability) subscale and a 7-item social inhibition (SI; the tendency to inhibit self-expression and experience feelings of discomfort in social interaction) subscale. Each

item has a 5-point Likert scale ranging from 0 = false to 4 = true. The NA and SI scales can be scored continuously at a range from 0-28 to assess these personality traits on ones own discretion. The combination of high scores (≥ 10) on both scales classifies subjects as type D personality (5). It has been shown that assessment of type D personality is not dependent on mood or health state (5, 24). The percentage of persons in the general population with a Type D personality used as reference value is derived from a validation study that consisted of 2508 subjects from the general population (1235 men and 1273 women; mean age 45.6 ± 15.9 years) (24). The validation study of the DS-14 showed that it is a reliable (internal consistency and test-retest reliability) and valid (internal and construct validity) questionnaire (24). Moreover, Type D personality appeared to be unrelated to age and gender.

Fatigue Assessment Scale (FAS)

The FAS (25) is a 10-item questionnaire to assess fatigue. Five questions reflect physical fatigue and five questions assess mental fatigue (26). The response scale is a 5-point scale (1 *never* to 5 *always*); scores on the FAS can range from 10 to 50. The cut-off score of the FAS is 22. A score below 22 indicates no fatigue, whereas a score of 22 or higher indicates fatigue.

Center for Epidemiological Studies-Depression Scale (CES-D)

The CES-D is a 20-item self-administered measure of depressive symptomatology developed by the National Institute of Mental Health's Center for Epidemiologic Studies. It assesses both negative and positive affect. The CES-D asks respondents to describe how they have been feeling over the past week. The response format is from 0-3 and corresponds 'to rarely or none of the time (less than 1 day)', 'some or a little of the time (1-2 days)', 'occasionally or moderate amount of the time (3-4 days)' and 'all of the time (5-7 days)'. Items measuring positive affect are scored in reverse so that higher scores correspond to lower positive affect. Overall scores range from 0-60 with higher scores indicating more depressive symptoms. A score of 16 is most commonly used to screen for depression, although a score

>16 does not necessarily mean that a patient suffers from depression (10).

World Health Organization Quality of Life assessment instrument-Bref (WHOQOL-Bref)

The WHOQOL-Bref is a generic, cross-culturally developed comprehensive measure of QOL (27, 28). It consists of 24 questions within four domains (Physical health, Psychological health, Social relationships, Environment) and two questions that compose the facet Overall QOL and general health. The psychometric properties of the WHOQOL-Bref have been examined in several studies and appeared to be good (27-29). In the present study only the facet Overall QOL and general health was used.

Statistical procedure

The differences of demographic characteristics, clinical characteristics (such as duration and severity disease), fatigue, depression, and QOL between patients with and without Type D personality in both patient groups were tested for statistical significance using the Student's t-test for independent samples or Chi-square tests when applicable. In addition, Chi-square tests were used to compare the two patient groups with regard to Type D personality, percentage scoring high on fatigue, and percentage scoring high on depressive symptoms.

A multiple linear regression analysis (method stepwise) with fatigue as dependent variable and clinical variables and DS-14 scores as independent variables was performed. Subsequently, depressive symptoms were entered as additional independent variable in the regression analysis. Similar regression analyses were done with the Overall QOL facet as dependent variable.

Statistical analyses were performed using SPSS, version 17.0 for Windows. Because of the number of t-tests performed, we considered a two-sided p-value less than 0.003 as statistically significant for these tests (Bonferroni correction).

RESULTS

The demographic and psychological characteristics of both patient groups and the most relevant

clinical data are summarized in Table 1. Of the studied sarcoidosis patients, 72% (317/441) had involvement of the lungs, 70% (304/441) of lymph nodes; 34% (150/441) of the eyes; 32% (141/441) of the joints; 8% (35/441) had cardiac involvement; 6% (26/441) had signs of neurosarcoidosis and 12.5% (55/441) had other manifestations of sarcoidosis; 17% (75/441) of the patients had only extrathoracic signs of sarcoidosis. Fifty-eight percent (n=256) of the sarcoidosis patients were treated with immunoregulatory drugs (51.9% only used corticosteroids (mean prednisone dose 10.1±7.5 mg; range 2.5-40 mg; daily), 48.1% used a low-dose corticosteroids (mean 6.8±2.5; range 2.5-10 mg; daily;) together with methotrexate (MTX:10.5±7.5; range 7.5-15 mg; once a week) and folic acid 5mg once a week). Only a minority of the total sarcoidosis population used antidepressants (n=11/441; 2.5%).

The majority of the IPF patients (90.0%) used immunoregulatory drugs and antioxidants (N-acetylcysteine: 3x 600mg daily). Of these patients (n=44), 56.8% were treated with corticosteroids only (mean 15.0±4.5 mg; range 5-30 mg; daily) and 43.2% were treated with corticosteroids (mean 9.1±5.4; range 2.5-15 mg daily) together with aza-

thioprine (mean 105±15.5 mg; range 50-150 mg daily). Only 4.1% (2/49) IPF patients used antidepressants.

The prevalence of Type D (TD) personality was 25.6% in the sarcoidosis population and 18.8% in the studied IPF patients. The percentage of patients having a Type D personality did not differ between both patient groups (p=0.311) nor compared with the general population (21%) (24).

Patients with a TD personality did not differ from non-TD's with regard to clinical data. However, TD sarcoidosis patients had higher scores on fatigue (t=-4.78) and depressive symptoms (t=-7.94) and lower QOL scores (t=4.20) compared with non TD sarcoidosis patients (all p-values <0.001). The only difference found within the IPF population was that the TD patients showed lower scores on the QOL domain Psychological health compared to the non-TD's.

In both patient populations a substantial number of patients indicated to suffer from fatigue. Within the sarcoidosis population 79.4% (350/434) reported fatigue (FAS score >21), whereas 85.7% (42/49) of the IPF patients. This was not statistically different. Depressive symptoms (CES-D score ≥16) were reported by 32.7% (144/387) of the sar-

Table 1. Summary of the demographic, clinical and psychological characteristics of the studied idiopathic pulmonary fibrosis (IPF) and sarcoidosis population

	IPF patients	Sarcoidosis patients
Number	49	441
Age, years*	63.1±11.8	45.4±11.4
Gender f/m; %	37.5/62.5	45.8/54.2
Time since diagnosis, yrs	3.1±4.7	5.1±7.6
DLCO, % of predicted values*	43.5±13.9	86.0±17.7
FVC, % of predicted values*	82.9±27.3	98.1±19.9
6 minute walking distance	380±107	476±108
Chest X-ray stage: 0-I vs II-IV %	n.a.	44.9/55.1
Treatment, no/yes %*	90.0/10.0	41.9/58.1
FAS	30.7±7.2	29.3±8.4
CES-D*	15.8±6.3	14.2±9.6
WHOQOL-Bref		
Facet Overall QOL*	10.5±3.3	11.9±3.2
Domain Physical health*	10.7±3.0	12.5±3.1
Domain Psychological health	13.4±2.5	13.8±2.5
Domain Social relationships	14.2±2.1	15.0±8.0
Domain Environment**	14.6±2.2	15.3±2.5
DS14 total	19.2±11.1	20.2±10.9
DS14 NA total	10.7±7.0	10.5±6.4
DS14 SI total	8.5±6.9	9.7±6.6

Data are expressed as mean±SD. * p<0.01; ** p<0.05. FAS: fatigue assessment scale; CES-D: Center of Epidemiological Studies-Depression; WHOQOL-Bref: World Health Organization Quality of Life assessment short form instrument; DS: Distressed Scale; D scale 14 (DS14) (negative affect (NA) and social inhibition (SI); n.a.= not applicable

coidosis patients compared to 34.7% (17/49) of the IPF patients.

Within the sarcoidosis group, TD patients reported more fatigue, also independent of disease severity ($F=6.53$, $p<0.0001$). However, when adding depressive symptoms to the regression analysis, depressive symptoms ($\text{Beta}=0.447$) but not TD predicted fatigue ($F=56.9$, $p<0.001$). Using both subscales of TD separately (NA and SI) did not change the result of the regression analyses. In addition, depressive symptoms ($\text{Beta}=-0.129$) and fatigue ($\text{Beta}=-0.636$) predicted poorer overall QOL ($F=187.0$, $p<0.001$), whereas TD personality did not. When entering the two subscales of TD, the results remained the same.

Within the IPF group, TD personality did not predict patients' fatigue scores. When adding depressive symptoms to the regression analysis, these symptoms ($\text{Beta}=0.658$) did predict fatigue scores ($F=23.0$, $p<0.001$). These results did not change when the components of TD were entered in the analysis. Concerning QOL, TD personality did not predict patients' overall QOL scores. When depressive symptoms and fatigue scores were added in the regression analysis, fatigue ($\text{Beta}=-0.586$) as well as TD ($\text{Beta}=0.264$) predicted overall QOL scores ($F=12.2$, $p<0.001$). Using the two components of TD, it appeared that fatigue ($\text{Beta}=-0.651$) and the component SI ($\text{Beta}=0.394$) predicted overall QOL scores ($F=16.7$, $p<0.001$).

No correlation was found between fatigue, depressive symptoms and lung function test results, disease localisation, disease severity or treatment in sarcoidosis. However, fatigue appeared to be negatively correlated with the 6 minute walking distance in IPF ($r=-0.452$; $p=0.003$); whereas in sarcoidosis this was only moderate ($r=-0.208$; $p=0.002$).

DISCUSSION

The aim of this study was to investigate the prevalence of Type D-personality in sarcoidosis and IPF, and its possible association with disease severity and QOL. The prevalence of TD in the studied sarcoidosis and IPF populations did not differ from a general population. Furthermore, in both patient populations TD was not associated with disease severity and did not predict fatigue scores. In the

IPF group, TD and its component SI (the tendency to inhibit self-expression in social interaction) predicted overall QOL scores whereas in sarcoidosis patients depressive symptoms and mainly fatigue played a role in the overall QOL scores.

Type D personality is defined as the interaction of negative affectivity (which is closely related to neuroticism) and social inhibition (1). Individuals who score high on negative affectivity seem to scan the world for signs of impending trouble and report more somatic problems (1, 24). The way people cope with negative emotions may be as important as the experience of negative emotions per se (6). It is an important predictor of morbidity, mortality, and QOL in cardiovascular diseases (3-6). In contrast, the present study indicates that sarcoidosis and IPF patients are not more bothered by personality dimensions such as negative affectivity and social inhibition compared to healthy controls.

Fatigue affects patients' QOL and health status in sarcoidosis as well as IPF (10, 11, 30-35). In line with this, in the present study fatigue appeared to be the most important factor influencing QOL in both disorders. The etiology is considered multifactorial (19, 31, 33, 36-41).

The clinical course of IPF, contrary to sarcoidosis may be relentless and cause severe physical impairment (42, 43). In line with previous studies, fatigue appeared to be associated with exercise limitation (shorter 6 MWD) especially in IPF (30, 33, 36, 42-44). Moreover, in line with others, depressive symptoms were found to be prevalent in the studied sarcoidosis and IPF patients (11, 17, 18, 33, 45). Depressive symptoms as well as cognitive failure also play a role in patients fatigue scores (33, 46, 47). However, in the present study, fatigue, but not depressive symptoms, predicted patients' overall QOL. Since both measures assess distinct concepts, the found relationship between the FAS and the CES-D is not caused by an overlap (10). This indicates that depressive symptoms play a role in the reporting of fatigue, but that the latter has a more incremental effect on patients' overall QOL.

Even more than in sarcoidosis, the progression of the disease in patients suffering from IPF may cause sadness, fear, worry, anxiety and panic. Social participation may be limited, and especially in end-stage lung fibrosis leaving the house can become impossible, which may cause distress (11, 14, 34, 35). In

line with this, it is reasonable to assume that the assessment, support, and reinforcement of a patient's psychosocial assets and ability to cope with a chronic disease like sarcoidosis and IPF can help enhance the QOL (14, 22, 33, 48-50). Moreover, these aspects should be a primary consideration in the development of rehabilitation programmes for patients suffering from sarcoidosis as well as IPF. As these problems seem to be underestimated it is justified to introduce psychological screening and, if needed, psychological counselling in the management of sarcoidosis and IPF patients.

In conclusion, negative emotions and inhibition of the expression of these emotions in social interaction (type-D or distressed personality) in the studied Dutch sarcoidosis and IPF patient populations did not differ from the general population. Mainly fatigue, and to a lesser extent depressive symptoms, are significantly affecting QOL. Therefore, it is recommended to incorporate psychological counselling, coping strategies and emotional support in the management of both devastating chronic disorders aiming to improve the QOL of the patients.

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