



## ORIGINAL ARTICLE – PILOT STUDY

### Fatigue Management in Patients with Sarcoidosis Using Group CBT

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#### Abstract

Sarcoidosis is a systemic granulomatous disease. At present, the issue of etiology of the disease has not yet been answered. The treatment of choice is corticosteroid therapy; new trends include biological treatment. Stress and overload often occur in the early stages, and depression and anxiety are added during the course of the disease. 50-70% of patients complain of fatigue, which affects the quality of their life even after the disappearance of other symptoms. Cognitive Behavioral Therapy (CBT) is recommended as the most suitable therapy for fatigue – it affects the anxiety and symptoms of depression and thus indirectly affects the fatigue (25, 27).

In our work, we used group CBT to influence fatigue. Group therapy lasted for 6 weeks. We set up a group of 14 patients who complained of fatigue during the reporting period. Patients completed the BDI-II and FAS questionnaires before starting the therapy, after six weeks and after one year. The results show that after six weeks there was no reduction in fatigue and depression, but after one year there was a statistically significant difference between the patient group and control group: in the patient group, the overall score decreased slightly on average (reduction of fatigue and depression), in the control group, the overall score increased significantly (worsening of fatigue and depression).

The greatest benefit of this study is the establishment of the Sarcoidosis Club, which meets regularly and has its place at professional events organized by the Pulmonary Clinic. Thanks to the offered group psychotherapy treatment, a group of the first members was created, to which others are gradually joining. It is obvious that there is great interest in this activity – it offers the possibility of sharing, a sense of belonging, and provides new information. Due to its formal involvement in ČOPN (Czech Civic Association against Lung Diseases), of which it became a member, it also influences health insurance companies.

#### Keywords

Sarcoidosis, fatigue, group psychotherapy, Cognitive Behavioral Therapy

#### Introduction

Stress and overload often occur in the early stages, and depression and anxiety are added during the course of the disease. The accompanying symptom in many patients is fatigue.

One of the goals of this work is to point out the importance of the process of psychotherapy in the bio-psycho-socio-spiritual concept of patient functioning. The offer of group psychotherapy in the environment of the non-psychiatric clinic at the University hospital initially seemed quite bold, but we still managed to implement it.

#### Sarcoidosis

Sarcoidosis is a systemic granulomatous disease. At present, the issue of etiology of the disease has not yet been answered. The cause

is an unknown noxa, which is able to persist in the tissues for a long time and elicits a characteristic immune response in a predisposed individual. In terms of genetic predisposition, it is a multifactorial disease. Infectious origin was not documented.

Clinical picture: in most patients, symptoms of acute or chronic systemic inflammatory response syndrome appear – i.e. subfebrile temperature to fever, fatigue, malaise, weight loss and alterations in general condition. Sarcoidosis more often affects women than men, with non-smokers predominating.

Treatment: the treatment of choice is corticosteroid therapy. In highly active forms, so-called “pulse therapy” can be initiated. New therapeutic trends include the emerging biological treatment.

Prognosis: The prognosis of sarcoidosis is relatively good: 50–60% of cases resolve spontaneously, 30–50% are cured after

corticosteroid therapy, and in 10–20% the disease persists. The mortality rate is 2–5%. Recurrences occur in 20–30% of cases. (13, 14)

## Fatigue in sarcoidosis

Everyone is tired sometimes – whether after physical or mental activity. Usually, rest, sleep, or vacation are enough to sufficient recovery. In this case, fatigue acts as a defense system that warns a person against overload. However, there are people in whom fatigue is one of the symptoms of their disease. It is the type of fatigue, where rest does not help – it has no defensive function.

Fatigue is reported by 50–70% of patients with sarcoidosis. The etiology of this problem remains unclear. Aspects associated with sarcoidosis – such as depression, anxiety, hypothyroidism, and worsening of sleep – can contribute to fatigue. Fatigue may be the result of treatment itself, including complications of corticosteroid therapy. The causes of fatigue can also be found in the causes of sarcoidosis – some theories speak of autoimmune factors, in which case there is a constant inflammation in the body, which automatically depletes the body. At the same time, we can also think about psychogenic influences – this would be indicated by the fact that fatigue sometimes does not correlate with the load or activity of the disease. Fatigue in patients with sarcoidosis is often associated with psychological stress and general deterioration in health. Significant reduction of physical activity and muscle weakness are also common in these patients (6).

Michielsen et al. (2006) point out that fatigue is the most common symptom of sarcoidosis. The extent and severity of fatigue do not correlate with the chest X-ray findings or lung function tests results. (19)

## Therapy options in the treatment of fatigue

Due to the multifactorial etiology of sarcoidosis, there is no causal treatment. In general, the treatment of chronic fatigue is referred to as a gradual increase in activity – which may seem strange and difficult to accept by the laymen, because it is completely against the general opinion. The general opinion among the public is that when a person is tired, he or she should rest.

Praško's (2006) recommendations for the treatment of fatigue are as follows: diet, antidepressants and other drugs, corticosteroids, gradual rehabilitation, alternative medicine, and psychotherapy. (25)

## Fatigue measurement

Measuring fatigue is always difficult. It is not precisely defined what fatigue is. At the psychological level, fatigue can be measured using questionnaires and scales – but it must be taken into consideration that the results record the subjective feelings of the interviewees. Fatigue is one of the symptoms of depression and is difficult to separate from depression.

To measure fatigue – especially in sarcoidosis – there are several questionnaires in the literature, which focus directly on the disease or the quality of life in sarcoidosis, and fatigue questions are part of them: FAS (The Fatigue Assessment Scale) (7), The Sarcoidosis

Health Questionnaire (4), and The King's Sarcoidosis Questionnaire for the assessment of health status (19).

## Depression and anxiety in sarcoidosis

Fatigue in patients with sarcoidosis is often accompanied by psychological stress and general deterioration in health. Significant reduction in physical activity and muscle weakness are also common in these patients. (7)

The reported incidence of depression in patients with sarcoidosis often differs significantly in the literature: in Chang et al. (2001), the highest prevalence of depression was 60% (10). The lowest incidence of depression is reported in studies conducted in the Netherlands: 18%, 18%, and 17%. (9, 30)

The relationship between depression, fatigue and anxiety is interesting. Kulberg (2014) states that patients who claim that they feel tired show depressive symptoms in 30% and increased anxiety in 40%. It is difficult to determine what is the primary cause – are they depressed and anxious because they are tired? Or is fatigue one of the symptoms of depression? At the same time, however, the results show that 60% of patients suffer from fatigue even though they are neither depressed nor anxious. (17)

Chronic post-inflammatory fatigue after clinical remission of sarcoidosis is associated with a tread of risk factors: a specific personality profile with profound neurotic characteristics combined with high levels of mental exertion and a reduction in baseline ACTH / cortisol levels. (14)

## CBT in sarcoidosis and fatigue in the literature

The literature states that the only treatment strategies that have been shown to be effective in treating chronic fatigue are cognitive-behavioral strategies. The most important starting point is the support of activity, rest and sleep, followed by a gradual return to full life; ongoing monitoring of any “catastrophic” misinterpretation of symptoms and solving of current life's difficulties. (28)

According to a meta-analysis by Price et al. (2008), cognitive-behavioral therapy appears to be the most appropriate: 15 studies (1,043 participants with CFS) were included in the review. When comparing CBT with regular care (6 studies, a total of 373 participants), the difference in mean fatigue after treatment was very significant in favor of CBT (SMD -0.39; 95% CI -0.60 to -0.19), with 40% of respondents who underwent CBT (4 studies, a total of 371 participants) showed a clinical response in contrast to 26% of respondents treated with conventionally (OR 0.47; 95% CI 0.29 to 0.76). (25)

## Group CBT

The advantage of the group form of psychotherapy is that the clients enrich each other with their experiences, knowledge, insights, and feedback. It offers clients a secure environment in which they can be open.

The group of patients is made up with a certain purpose. In addition to the usual patient-therapist relationship that takes place in individual psychotherapy, there is also interaction between the members of the group. As a result, it enriches the effect of psychotherapy by another dimension and strengthens the influence



of some therapeutic factors. Relationships and related interactions can serve to facilitate mutual listening to each other, encouragement and emotional support, but also to manifest, understand and correct mistakes in attitudes and behavior towards people. Group cohesion plays an important role. (17) Therapy takes place according to the principles of CBT – it is short-term, structured, focused on specific limited tasks, focused on presence, and leads to self-sufficiency of the clients. (16)

The topic of group psychotherapy in patients with sarcoidosis has not been found in the literature.

A study that was carried out in Manchester focused on the effectiveness of group CBT in asthma. The participants were severe asthma patients with a clinically significant diagnosis of anxiety and/or depression (51 respondents) who underwent 8 weeks of group CBT. According to the results, the monitored parameters improved in 36% of respondents. Participants stated in feedback that the CBT group contributed to a better understanding of their disease. In its conclusion, the study recommends group CBT as a promising option in patients with asthma. (30)

Studies (1, 3, 12, 16, 22, 24, 29) suggest that group CBT should be considered an integral part of standard pharmacotherapy for the treatment of mental health symptoms in people with chronic diseases and disabilities, especially in depression and anxiety.

## Practical part

### Objectives of the work

In the practical part, we focused on cognitive-behavioral group psychotherapy that deals with fatigue in patients with sarcoidosis.

We have set the following objectives for our research work:

1. To set up a group of patients who have a diagnosis of sarcoidosis and complain of fatigue – to address patients who have this symptom and offer them the possibility of psychotherapeutic intervention.
2. To explain to the patients the principle of CBT and group therapy and their use in the treatment of fatigue, so they would understand the relationship between mental processes and physical functioning.
3. To measure fatigue and depression in these patients – so that we can measure the effect of psychotherapy and compare it with the results of other studies and so that the patients also have feedback.
4. To compile a psychotherapeutic program for patients with fatigue – we focused on cognitive-behavioral psychotherapy and used its methods. The goal of therapy was to lead patients to better understand their fatigue – what affects it, how they participate in it, and how to prevent it.
5. To apply this program to patients with sarcoidosis – to test the program in the first groups of patients so that it will be possible to offer this program to other patients in the future.

6. To compare the results before and after the program with the results of the control group – to be able to verify the effect of psychotherapy.
7. To continue group work with patients with sarcoidosis.

## Hypotheses

### Main hypothesis:

Due to group cognitive-behavioral psychotherapy focused on fatigue, there will be a statistically significant improvement in fatigue in patients with sarcoidosis who complain of fatigue, compared to the control group.

### Secondary hypotheses:

Patients included in group psychotherapy will show a statistically significant improvement in fatigue.

Patients included in group psychotherapy will show a statistically significant improvement in depressive symptoms.

There will be no statistically significant improvement in fatigue in the control group.

There will be no statistically significant improvement in depression symptoms in the control group.

## Group description

The group consisted of patients from the Department of Pulmonary Diseases and Tuberculosis (hereinafter referred to as the Pulmonary Clinic) of the University Hospital in Olomouc with a diagnosis of sarcoidosis, who complained of fatigue during an outpatient examination for 2 months. The patients were approached by their outpatient doctor: out of the 17 patients 15 agreed. 1 respondent broke her leg after the first meeting and could not attend, so she was excluded from the follow-up. Because of a larger number of patients, we divided the group into two smaller groups of 7 people – depending on which time suited the respondents better. 4 patients were treated with antidepressants at the time of the experiment – in all cases it was a long-term treatment (more than a year). The group consisted of patients from a large catchment area (approximately 1.5 million inhabitants).

Descriptive characteristics of the PATIENT group

PATIENTS	number	percentage
Male	8	57.1%
Female	6	42.9%

PATIENTS	Average	SD	Minimum	Maximum	Median
Age	53.7	10.8	34	69	57.0

\*SD = Standard deviation

Control group: the control group consisted of patients with the same diagnosis also complaining of fatigue, who came to the sarcoidosis clinic within the next two months.



### Descriptive characteristics of the CONTROL group

CONTROL		number	percentage		
Male		5	35.7%		
Female		9	64.3%		
CONTROL	Average	SD	Minimum	Maximum	Median
Age	52.0	12.0	33	75	52.0

\*SD = Standard deviation

## Methodology

Beck Depression Inventory for adults (BDI-II) is a screening test used as a tool to examine the depth of depression. (2)

We have compiled a Fatigue Diary similarly to the Sleep Diary or Pain Diary. Each respondent's task was to record on a daily basis the numerical value of their fatigue for the whole day in the range 0-10, where 0 means no fatigue, and 10 means the maximum possible fatigue they can imagine. They were supposed to write the value at the same time each day. Respondents were also supposed to verbally record if anything exceptional that could affect fatigue was happening, or, for extreme fatigue values, to write down what they were doing that day.

Fatigue scale: we used FAS scale in the experiment. According to the authors, FAS is a tool for measuring fatigue with proven validity and reliability. Its advantage is simple administration and simple evaluation. Respondents choose the numerical value on a five-point scale.

## Procedure

Selected patients were indicated by an outpatient physician. Those who agreed to the therapy were first educated about the program and goals of the experiment. Then they were subjected to initial testing in this order: BDI-II, Fatigue Scale. During the therapy, they kept a Fatigue Diary. At the end of the program, they underwent retesting.

The control group was tested at a similar time interval without any psychotherapy. We used the dates of regular check-ups in the outpatient clinic for the testing.

The group was led by a therapist and co-therapist. The frequency of meetings was 2 hours once a week. 1 group took place in the morning, 1 group in the afternoon. A total of 7 sessions took place. Between the sessions, patients were given homework: to relax regularly and write data to the Fatigue Diary.

### Program of group meetings:

1. Education, general principles of CBT, measurement of depression and fatigue, contract, introduction to the Fatigue Diary and therapy program.
2. Goal setting, training Ostova's progressive muscle relaxation.
3. Fatigue map
4. The vicious circle of fatigue, gains

5. Compilation of a prevention program – preventive measurements against fatigue, which patients recommend to the other patients.
6. Checking goals, retesting
7. Retesting after a year

## Results

14 people, 6-week therapy focused on fatigue – testing before and after the therapy, control testing after a year. Always the same questionnaires used: BDI-II, FAS (fatigue scale).

Input measurements: BDI-I, FAS-I

Measurements after 6 weeks: BDI-II, FAS-II

Measurements after 1 year: BDI-III, FAS-III

Patient group: hereinafter referred to as PATIENTS

Control group: hereinafter referred to as CONTROL

BDI Questionnaire – Patients: Wilcoxon paired test with Boferroni correction

BDI_I vs. BDI_II	0.079
BDI_I vs. BD I_III	0.389

There was no significant change in the overall BDI score after 6 weeks, respectively after a year.

FAS Questionnaire – Patients: Wilcoxon paired test with Boferroni correction

FAS_I vs. FAS_II	0.951
FAS_I vs. BD I_III	1.000

There was no significant change in the overall FAS score after 6 weeks, respectively after a year.

### Description characteristics in the CONTROL group

CONTROL GROUP	number	percentage
Male	5	35.7%
Female	9	64.3%

CONTROL GROUP	Average	SD	Minimum	Maximum	Median
Age	52.0	12.0	33	75	52.0

\*SD = Standard deviation

BDI Questionnaire: Wilcoxon paired test with Boferroni correction

BDI_I vs. BDI_II	0.558
BDI_I vs. BD I_III	<b>0.003</b>

In the control group, a significant increase in the total BDI score after 1 year ( $p = 0.003$ ) was demonstrated.

FAS Questionnaire: Wilcoxon paired test with Boferroni correction

FAS_I vs. FAS_II	0.946
FAS_I vs. BD I_III	<b>0.015</b>

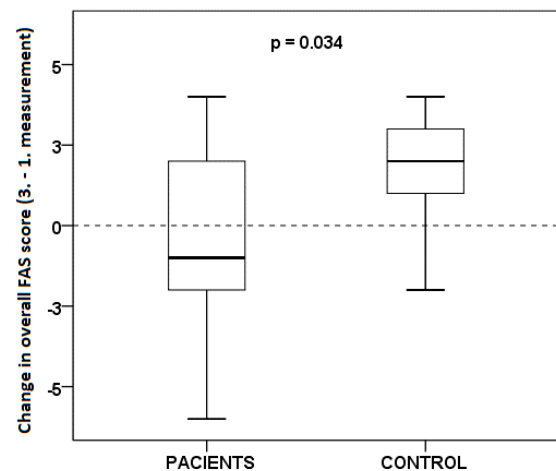
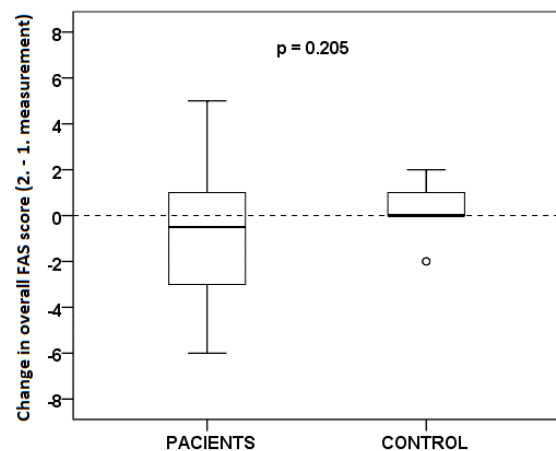
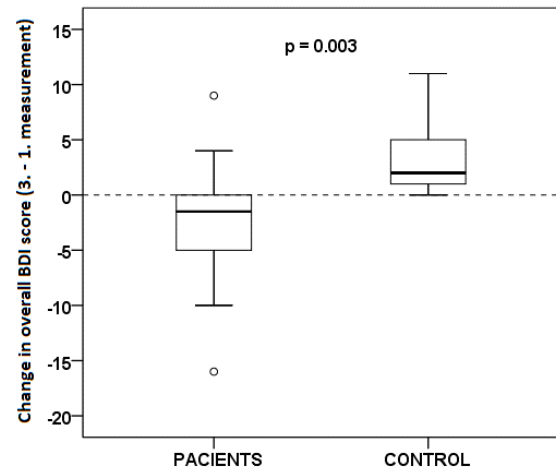
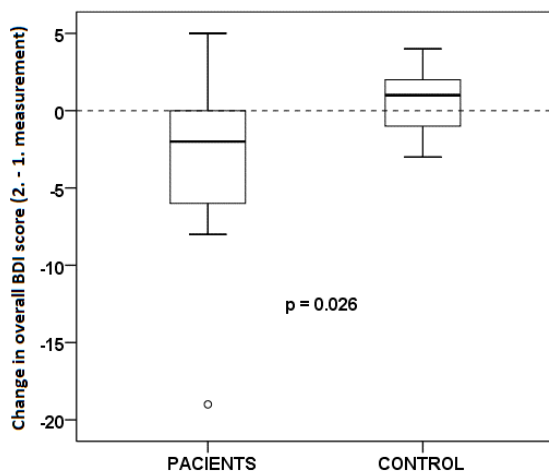
In the control group, a significant increase in the overall FASS score after 1 year ( $p = 0.015$ ) was demonstrated.

Patients vs. control group – comparison of changes in the overall score

	Mann-Whitney U test p values
DIF BDI II-I	<b>0.026</b>
DIF BDI III-I	<b>0.003</b>
DIF FAS II-I	0.205
DIF FAS III-I	<b>0.034</b>

The patient group and the control group differ statistically significantly in the change of the overall BDI score after 6 weeks and after 1 year. While in the patient group the overall score decreased on average, in the control group the overall score increased.

The patient group and the control group differ statistically significantly in the change of the overall FAS score after 1 year. In the patient group, the overall score decreased slightly on average, while in the control group the overall score increased significantly.



IBM SPSS Statistics version 22 statistical software was used to analyze the data. All tests were performed at a significance level of 0.05.

## Discussion

Initially, we assumed that our patients would need procedures, that are applied, for example, in the psychotherapy of fatigue in chronic fatigue – gradual activation, adding tasks etc.. During the therapy,





however, it turned out that the problem of our patients lies in something else: our clients are rather too active and unable to rest and relax. Due to lack of time, they tried, for example, to relax at work or while driving a car. For further therapy, it would therefore be appropriate to include time management, working with values and assertiveness.

Within the group, the bonds between patients and between patients and therapists were established. Within these bonds, transferences occurred – which certainly affected the results, but which we were not able to measure or record.

Patients rated fatigue during the day with a single value – fatigue fluctuates during the day, so the resulting value is either the average of values during the day or is affected by the current state.

The positive influence of the group was mainly reflected in the sharing experience – “we are all equally sick, we have similar problems, we understand each other”. The influence of peer therapy was also beneficial – “more experienced” patients could “advise” new patients.

In accordance with the works that are listed in the literature (4, 5, 18), we have demonstrated depression and increased degree of fatigue in our patients by testing. Using BDI-II, we were able to verify the degree of depression. However, it is necessary to point out that this is only the current condition, not depression as a diagnosis.

De Kleijn review (5) analyzed published data on the evaluation, prevalence, etiology, and treatment of fatigue associated with sarcoidosis. Although studies with good methodological evaluation of fatigue have found that there is no relationship between clinical parameters and fatigue in patients with sarcoidosis, the remaining studies report a relationship between fatigue and clinical and psychological parameters. These evaluations illustrate the inconsistency of previous research and show that fatigue has been an insufficiently researched complication of sarcoidosis.

Unfortunately, not many studies have addressed the topic of psychotherapy for fatigue in sarcoidosis. In other chronic diseases where fatigue occurs, the effectiveness of psychotherapy in reducing fatigue has been demonstrated.

In a statistical comparison, there was no statistically significant improvement in patients with CBT therapy after 6 weeks or 1 year. In patients in the control group, there was a statistically significant deterioration in both FAS and BDI-II after 1 year. We assume that 6 weeks is too short a time for the effect of psychotherapy on fatigue. Although there was no statistically significant improvement after 1 year, the overall BDI and FAS scores after 1 year decreased. We can assume that with a larger sample of patients, this reduction would be statistically significant. There is a significant difference between the patient group and the control group. We explain this difference by the fact that patients from the CBT group learned the tools to react to fatigue – they learned to relax, they were able to orient themselves better in their fatigue (they were able to reveal triggers, choose a suitable type of rest according to the fatigue map and vicious circle, and they were inspired by new fatigue management strategies). Therefore, there was no deterioration in the observed period. In patients from the control group who did not have new strategies for managing fatigue and used existing ones, the fatigue worsened. Statistical evaluation is influenced by a small number of respondents – however, even in the literature we find rather smaller sample groups in published works on group therapy (31, 3).

We consider the establishment of the Sarcoidosis Club to be the greatest benefit of the study. The Club meets regularly and has its place at professional events organized by the Pulmonary Clinic. Thanks to the offered group psychotherapy treatment, a group of the first members was created, to which others are gradually joining. It is obvious that there is great interest in this activity – it offers the possibility of sharing, a sense of belonging, provides new information, and due to its formal structure, it also influences health insurance companies. The activity is positively evaluated by both patients and healthcare professionals. In addition to information about diagnosis and treatment, new patients are offered the opportunity to join a group and meet people with the same diagnosis. At present, the Sarcoidosis Club has 40 members from all over the Czech Republic, as well as 3 patients who travel from Slovakia.

## Hypotheses testing

Main hypothesis: due to group cognitive behavioral psychotherapy focused on fatigue, there will be a statistically significant improvement in fatigue in patients with sarcoidosis who complain of fatigue, compared to the control group.

The main hypothesis was confirmed:

No significant change in BDI-II or FAS was demonstrated in patients in the CBT group after six weeks or one year. In patients in the control group, there was a significant worsening in BDI-II and FAS after one year. But the patient group and the control group differ statistically significantly in the change in the total BDI-II score after six weeks and after one year.

Secondary hypotheses:

1. Patients included in group psychotherapy will show a statistically significant improvement in fatigue:

The hypothesis was not confirmed – no significant change in FAS was demonstrated in patients in the CBT group after six weeks or one year.

2. Patients included in group psychotherapy will show a statistically significant improvement in depressive symptoms:

The hypothesis was not confirmed – no significant change in BDI-II was demonstrated in patients in the CBT group after six weeks or one year.

3. There will be no statistically significant improvement in fatigue in the control group:

The hypothesis was confirmed – in the control group, a significant deterioration in FAS scores was demonstrated after one year.

4. There will be no significant improvement in depressive symptoms in the control group:

The hypothesis was confirmed – in the control group, a significant deterioration in BDI-II scores was demonstrated after one year.



## Conclusion

With the help of the attending physician, it was possible to set up 2 groups of sarcoidosis patients who agreed with the proposed psychotherapeutic treatment.

Patients were informed about the principles of the group psychotherapy and CBT.

Before starting the therapy, we measured the fatigue and depression of our patients using BDI-II and FAS scales.

We have compiled a program for group CBT – 6 sessions with a weekly frequency and one session after a year. With the help of psychotherapy, patients tried – within the limits of their possibilities – to examine their fatigue and, within a vicious circle, to find out what positive or negative gains they have. In setting and controlling goals, they gained a more realistic view of their fatigue management options. They were inspired by other participants in creating a preventive program against fatigue.

The sessions worked very well, the patients were active, and they were satisfied with the therapy (see feedback).

We verified the results of the therapy effect by BDI-II and FAS retesting.

The patient group and the control group differ statistically significantly in the change in the overall FAS score after one year. In the patient group, the overall score decreased slightly on average, while in control group the overall score increased significantly.

The group continues to function, although now in a different form – due to the large number of applicants, it provides now more of an educational support. We joined ČOPN (Czech Civic Association against Lung Diseases) and founded the Sarcoidosis Club. Patients are members of the ČOPN management, they are regularly invited to professional events of the Pulmonary Clinic, and they have their own section at professional congresses held in Olomouc.

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