Three types of fatigue in sarcoidosis patients

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Background

- Fatigue is frequently reported in sarcoidosis and appears to differ between patients.
- Intermittent fatigue, Early Morning Fatigue, and Afternoon Fatigue have been described in sarcoidosis, but these types of fatigue are not yet validated.
- Therefore, the aim of this study was to examine whether these types of fatigue can be identified in sarcoidosis, and to describe the characteristics of those types.

Methods

- Sarcoidosis outpatients (n = 434) of the Maastricht University Medical Centre.
- Questionnaires regarding:
  - Depressive symptoms,
  - Fatigue,
  - Quality of life,
  - Restless legs,
  - Dyspnea,
  - Anxiety,
  - Sleeping problems,
  - Employment
  - Symptoms indicative for small fiber neuropathy.
- Clinical data and demographics (see Table 1) were taken from the records.
- Types of fatigue were identified by means of latent class analysis, based on six indicators:
1. Do you have difficulties when waking up?
2. Do you feel tired a few hours after waking up?
3. How do you feel in the early afternoon?
4. Do you need more sleep?
5. Do you feel tired the whole day?
6. Do you take a nap during the daytime?

- For comparison of psychological, demographical and clinical characteristics between the encountered latent classes we used the Chi-square tests for categorical and F tests for continuous variables

Results

Table 1. Symptoms, demographical, clinical, psychological, sleep and employment related characteristics, stratified by type of fatigue in sarcoidosis

	MF (n = 130)	IF (n = 220)	ADF (n = 84)
Demographics			
Age in years	48.0 ± 11.2	47.7 ± 10.9	48.2 ± 11.1
Female [d]	35 %	50 %	52 %
Clinical			
Radiographic stage: 0 / I / II / III / IV (frequencies)	46 / 9 / 32 / 19 / 23	92 / 23 / 55 / 25 / 24	34 / 6 / 9 / 11 / 14
Use of corticosteroids	35 %	34 %	41 %
BMI (kg/m^2)	26.6 ± 4.6	27.7 ± 5.4	27.8 ± 6.8
Multisystemic involvement	45 %	48 %	48 %
Time since diagnosis in years	8.3 ± 9.6	7.2 ± 6.5	8.0 ± 8.0
FEV$_1$ [b]	87.6 ± 23.5	91.9 ± 21.0	84.4 ± 22.8
FVC [b]	97.5 ± 21.3	101.1 ± 18.7	93.4 ± 18.9
DLCO [b]	80.4 ± 19.6	83.9 ± 15.3	76.7 ± 17.8
Symptoms			
SFN-associated symptoms [d]	14.8 ± 12.8	26.7 ± 13.8	31.0 ± 17.5
Dyspnea [d]	2.0 ± 1.7	2.6 ± 1.8	3.8 ± 2.5
Depressive symptoms [a]	9.3 ± 8.0	15.4 ± 8.9	19.6 ± 10.6
Pain [d]	1.8 ± 0.9	2.7 ± 1.1	2.9 ± 1.2
Fatigue [a]	22.2 ± 6.8	31.0 ± 6.9	36.2 ± 6.3
Sleep			
Fallen asleep is difficult [c]	1.8 ± 1.1	1.9 ± 1.0	2.6 ± 1.4
Restless legs [d]	22 %	44 %	45 %
Wakes up more often during night	44 %	50 %	55 %
Psychological			
Trait anxiety [a]	34.9 ± 10.1	41.5 ± 9.7	45.0 ± 10.0
Overall Facet [a]	6.9 ± 1.4	5.8 ± 1.4	4.8 ± 1.3
Physical Health[a]	14.9 ± 2.9	12.0 ± 2.6	10.3 ± 2.4
Psychological Health [a]	15.0 ± 2.5	13.6 ± 2.2	12.7 ± 2.4
Social Relationships [d]	15.3 ± 2.7	14.3 ± 3.0	13.9 ± 3.0
Environment [d]	16.3 ± 2.5	15.1 ± 2.3	14.5 ± 2.7
Employment			
Employment [a]	73%	56 %	35 %
Working on irregular hours	30 %	31 %	15 %
Unfit to work [a]	12 %	30 %	53 %

Data are expressed as means ± standard deviation or in percentages.

Comparisons between ADF, IF and MF: [a] Significant difference between the three types of fatigue; [b] Significant difference between ADF versus IF; [c] Significant difference between ADF versus IF and MF; [d] Significant difference between MF versus IF and ADF.

ADF All Day Fatigue; BMI Body Mass Index; DLCO Diffuse capacity of the lung for carbon monoxide; FEV$_1$ Forced Expiratory Volume in one second; FVC Forced Vital Capacity IF Intermittent Fatigue; MF Mild Fatigue; SFN Small Fiber Neuropathy.

- Latent Cluster Analysis revealed three clusters:

1. Mild Fatigue: patients with mild or no complaints of fatigue
2. Intermittent Fatigue: patients with complaints of fatigue that varied during the day,
3. All Day Fatigue: patients who felt tired the whole day.

- All Day Fatigue patients reported the most complaints and they were most often declared to be unfit to work (see Table 1).

Table 2. Class proportion and class-specific means and percentages a for the six indicators.

	Log-likelihood value (LL)	BIC(LL)	Number of parameters	df	Bootstrap p-value
1-Cluster	-2175	4429	13	421	>0.001
2-Clusters	-2101	4324	20	414	>0.001
3-Clusters	**-2051**	**4267**	**27**	**407**	**0.05**
4-Clusters	-2038	4283	34	400	0.14
5-Clusters	-2033	4314	41	393	0.23

BIC(LL) = Bayesian Information Criterion, computed using the log-likelihood value; the preferred model is the one with the lowest BIC value.

Conclusions

- Intermittent fatigue was validated and two other types were found.

- This clustering provides a useful typology of individual patients that may be applied in clinical settings.

- Especially for the All Day Fatigue type psychological counseling is recommended, in order to improve the wellbeing of the patients.

Acknowledgements

Sarcoïdose
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ild care foundation
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