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Is there any difference in acromegaly and other chronic disease in quality of life and psychiatric morbidity?

Czy istnieje różnica w jakości życia i występowaniu objawów psychiatrycznych u chorych na akromegalię i inne choroby przewlekłe?

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Abstract

Introduction: The study aimed to evaluate the psychological profile of patients with acromegaly in comparison to other chronic diseases such as non-functioning pituitary adenomas, Cushing disease, and plaque psoriasis, and to a healthy control group.
Material and methods: A total sample of 153 participants in clinical groups underwent a cross-sectional assessment including the quality of life (AcroQoL, WHOQoL-BREF), psychiatric morbidity (GHQ-28), and the acceptance of illness (AIS), as well as 65 participants in the healthy control group.
Results: The whole study sample had a predominance of urban married females (61%) with medium level of education (41%). Patients with acromegaly were diagnosed significantly later than patients from other clinical groups, after the onset of the first symptoms. Acromegaly was related to the presence of more symptoms of anxiety and insomnia, and poorer social relationships compared with the general population but not more than in other chronic diseases.
A better quality of life score in all domains of WHOQoL-BREF was associated with a better score on the acceptance of illness scale and lower scores on GHQ-28.
Conclusions: Psychiatric morbidity, mainly anxiety and insomnia, occurs in 50% of patients with acromegaly. However, the psychological wellbeing and mood seem to be related to other factors such as the acceptance of the illness. Thus, concerning the diagnosis, treatment, and monitoring of acromegaly an interdisciplinary approach, taking into account psychological and psychiatric consultation, is needed. **(Endokrynol Pol 2017; 68 (5): 524–532)**

Key words: *acromegaly, chronic disease, quality of life, psychopathology*

Streszczenie

Wstęp: Celem pracy była ocena profilu psychologicznego pacjentów z akromegalią w porównaniu z pacjentami z innymi chorobami przewlekłymi, takimi jak: nieczynne hormonalnie gruczolaki przysadki, choroba Cushinga, łuszczyca oraz zdrowych z grupy kontrolnej.
Materiał i metody: Badaniem objęto 153 chorych w grupach klinicznych, którzy zostali poddani szerokiej ocenie obejmującej: jakość życia (AcroQoL, WHOQoL-BREF), występowanie zaburzeń psychiatrycznych (GHQ-28) i stopień akceptacji choroby (AIS) oraz 65 uczestników z grupy kontrolnej.
Wyniki: W całej grupie badanej obserwowano przewagę zamężnych, miejskich kobiet (61%) z wykształceniem średnim (41%). Pacjenci z akromegalią byli diagnozowani znacznie później w stosunku do pozostałych grup chorych, po pojawieniu się pierwszych objawów. Akromegalia charakteryzowała się częstszym występowaniem bezsenności i lęku oraz gorszymi relacjami społecznymi w porównaniu z populacją ogólną, ale nie w stosunku do innych chorób przewlekłych. Lepsza jakość życia we wszystkich domenach formularza WHOQoL-BREF wiązała się z większą akceptacją choroby i niższym wynikiem w skali GHQ-28.
Wnioski: Zaburzenia psychiatryczne, głównie lęk i bezsenność, występują u 50% pacjentów z akromegalią. Jednak stan psychiczny i nastrój wydają się związane z innym czynnikiem, jakim jest stopień akceptacji choroby. Podkreśla to potrzebę opieki interdyscyplinarnej, uwzględniającej opiekę psychiatryczną i psychologiczną, w diagnostyce, leczeniu i monitorowaniu pacjentów z akromegalią. **(Endokrynol Pol 2017; 68 (5): 524–532)**

Słowa kluczowe: *akromegalia, choroba przewlekła, jakość życia, psychopatologia*

Introduction

Acromegaly is a rare, chronic disease with an incidence rate of 3–4 cases per million, caused by excessive production of growth hormone (GH) as a result of a pituitary adenoma in almost all cases [1, 2]. According to most studies, patients with acromegaly have impaired quality of life (QoL) due to the chronic nature of the

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disease, the burden of comorbidities, and, potentially, the burden of therapy [3, 4]. With references to the guidelines, not only biochemical parameters but also the improvement of the QoL should be considered in clinical practice as tools to assess the success in acromegaly treatment [6, 7]. Normalisation of GH and IGF-1 (insulin-like growth factor-1) levels and their relation to better QoL is still debatable [8–12]. The research emphasises that the QoL correlates with variables such as age, duration of the disease, treatment, presence of other symptoms, disease activity, and gender. Female gender, older age, macroadenomas, and radiotherapy correlate with a lower QoL [11, 13]. Moreover, depression and anxiety seem to have a greater impact on the QoL than the biochemical parameters [14]. Long lasting endocrine diseases in general are frequently associated with a wide range of psychological distress, which often reach the level of psychiatric morbidity. Irritable mood occurred in 46% of patients successfully treated for endocrine conditions, a rate similar to that found in cardiological diseases and higher than in oncological and gastroenterological diseases [15]. Among all patients with pituitary adenoma, the patients with remitted Cushing's disease demonstrate the smallest improvement of QoL after the treatment [16]. There are not many papers comparing the QoL in acromegaly and other chronic diseases; however, one of them shows no significant difference between acromegalics and other patients suffering from cardiovascular diseases, malignancies, rheumatic diseases, and chronic pulmonary obstruction [13].

The aim of this study was to evaluate the QoL, the acceptance of illness, and the psychopathological status in patients with acromegaly in a cross-sectional manner in comparison with those suffering from other severe chronic diseases affecting the QoL.

Materials and Methods

Setting and design

A comparative, cross-sectional cohort study was conducted at the Department of Endocrinology, Diabetes, and Isotope Therapy and the Department of Dermatology, Venerology, and Allergology, Wroclaw Medical University during the years 2012–2015.

Sample

Two hundred and eighteen participants were enrolled in the study. All the participants were recruited on the basis of written, informed consent assuring confidentiality and freedom of choice of the participation. The Research Ethics Committee of Wroclaw Medical University had approved the study. The purposive sample comprised five groups. Three research groups composed of pituitary adenomas patients: 1. acromegaly patients (A), n = 50; 2. Cushing disease patients (CD), n = 15; and 3. non-functioning pituitary adenoma patients (NFPA), n = 37. There were two control groups included in the study. A group of chronic disease: 4. psoriasis patients (P), n = 51; and 5. a group of healthy controls (HC), n = 65 recruited from the attendants/relatives of the patients and volunteers. The rationale for the inclusion in the study different groups is the willingness to compare QoL of patients diagnosed with pituitary adenomas with different consequences such as changes in appearance (A, CD) or without these changes (NFPA), and with patients chronically ill with visual changes in the appearance resulting from non-endocrine disease (P). The clinical groups included patients of both genders and age range 19–87 years. That choice of the study group was strictly connected with the observation character of the analyses and emphasising the problem of living with chronic disease. Therefore, the authors decided not to introduce any additional divisions into subgroups considering the degree of disease severity. In case of acromegaly, the subjects are patients with active acromegaly (n = 32) as well as patients with somatostatin analogue-controlled disease (n = 18).

Acromegaly was diagnosed based on clinical and biochemical parameters by nadir serum GH after an oral glucose tolerance test (OGTT) 0.4 ng/mL, and elevated IGF-1 for age and gender. Age and sex-normalised levels of IGF-1, associated with nadir GH after OGTT < 0.4 ng/mL after surgery and random GH < 1 ng/mL when treated with somatostatin analogues, are taken as a criterion of cure or good disease control [6, 7, 17, 18].

The diagnosis of CD was based on the clinical signs and standard hormonal criteria: increased urinary excretion of UFC (urinary free cortisol), loss of cortisol circadian rhythm, and failure of serum cortisol to suppress below 1.8 μg/dl (50 nmol/L) during low-dose dexamethasone suppression tests (DST 1 mg overnight or LDDST; 2 mg/day over 48 hours). The pituitary aetiology of CD was confirmed basing on a serum cortisol and UFC suppression greater than 50% on a high-dose dexamethasone suppression test (HDDST; 2 mg q.i.d. for 48 h), an inappropriately normal or increased ACTH level (above 20 pg/mL), and positive MRI. The criteria for remission were: serum cortisol within the referral range, normal circadian rhythm, and the ability of serum cortisol to suppress to values < 1.8 μg/dL after DST 1 mg overnight [19–21]. Patients with NFPA did not present any symptoms of classical clinical hormone excess syndrome. They presented effects of mass (visual fields defect, headache, and deficiencies of pituitary hormones). The diagnosis is usually late, in a stage of macroadenomas, mostly with invasion of the adjacent structures. Transsphenoidal surgery is rarely curative,

Table I. *Demographic characteristics of the study groups*
Tabela I. *Charakterystyka grup badanych*

	A (n = 50)	CD (n = 15)	NFPA (n = 37)	P (n = 51)	HC (n = 65)	p-value	
Gender (females) n (%)	31 (62%)	14 (93%)	27 (73%)	19 (37%)	42 (65%)	CD vs P	p = 0.0002
						NFPA vs P	p = 0.001
						HC vs P	p = 0.005
Age (mean years ± SD)	51.7 ± 14.5	45.1 ± 13.92	48.9 ± 15.42	42.3 ± 13.3	44.8 ± 16.1	A vs P	p = 0.01
Education n (%)							
low	4 (8%)	–	2 (5%)	–	2 (3%)		
medium	31 (62%)	8 (53%)	25 (68%)	33 (65%)	57 (53%)		
high	14 (38%)	7 (47%)	10 (27%)	17 (33%)	27 (42%)		
unknown	1 (2%)	–	–	1 (2%)	1 (2%)		
Locality of living n (%)							
city	35 (70%)	11 (73%)	6 (16%)	31 (61%)	53 (82%)		
country	15 (30%)	4 (27%)	31 (84%)	19 (37%)	12 (18%)		
unknown	–	–	–	1 (2%)	–		
Time since diagnosis (in years)	8.4 ± 8.8	6.4 ± 8.0	7.4 ±9.1	17.7 ±11.7	–	A vs. P	p = 0.0009
						CD vs. P	p = 0.002
						NFPA vs. P	p = 0.0002
The duration since first symptoms to diagnosis n (%)						A vs. CD	p = 0.03
						A vs. NFPA	p = 0.002
						A vs. P	p = 0.0002
< 6 months	4 (8%)	4 (27%)	15 (42%)	23 (45%)	–		
6–12 months	0 (0%)	5 (33%)	5 (14%)	7 (14%)	–		
1–3 years	8 (17%)	3 (20%)	3 (8%)	8 (16%)	–		
3–5 years	9 (19%)	1 (7%)	0 (0%)	1 (2%)	–		
5–10 years	12 (25%)	0 (0%)	8 (22%)	0 (0%)	–		
>10 years	15 (31%)	2 (13%)	5 (14%)	12 (24%)	–		

and tumour residue can regrow in as many as 65% of patients during long-term follow-up [22, 23].

The diagnosis of psoriasis was made according to the well-established clinical criteria, including sharply demarcated round-oval erythematous plaques with loosely adherent silvery-white scales, especially affecting the elbows, knees, lumbosacral area, intergluteal cleft, and scalp. The clinical extent of disease and its impact on QoL was based on PASI (Psoriasis Area Severity Index), BSA (Body Surface Area), and DLQI (Dermatology Life Quality Index) [24, 25]. All of the studied subjects fulfilled the criteria for moderate-to--severe psoriasis as defined by PASI and BSA (14.4 ± 6.7 points and 23.7 ± 16.3%, respectively). The mean DLQI score was assessed as 11.6 ± 6.4 points, which reflects a very large effect on the patient's life. The rest of subjects' characteristics are summarised in Table I.

Instruments

The following instruments were used in the patient groups:

1. A sociodemographic profile sheet.
2. A clinical profile sheet for different clinical groups, used to record the following clinical details: disease onset and duration, delay of diagnosis, first symptoms, treatment, comorbidities, and illness-related characteristics (e.g. IGF-1 level, GH level, PASSI, BSA).
3. The 26-item Polish version of the WHO Quality of Life Scale-BREF (WHOQoL-BREF) [26, 27]. It profiles the subjective evaluation of the QoL in the past two weeks for four domains: physical health (PhyHealth), psychological health (PsyHealth), social relationship SocRel), and environment (Enviro).

4. The 28-item version of the General Health Questionnaire [28] in Polish adaptation [29]. The scale was used to measure the general health status and its four components: A — GHQ-somatic symptoms, B — GHQ-anxiety and insomnia, C — GHQ-social dysfunction, and D — GHQ-severe depression. Higher scores indicate a greater probability of psychiatric distress.
5. The eight-item Acceptance of Illness Scale (AIS) in Polish adaptation [30]. Higher scores indicate a better illness acceptance.

Procedure

An endocrinologist and a dermatologist confirmed the diagnosis and carried out the initial recruitment and assessment using sociodemographic and clinical profile sheets. Thereafter, the psychologist administered all the instruments indicated above. Additionally, the subjects for the control group were recruited (Figure 1).

Statistical analysis

The values of quantitative variables are presented by specifying the mean value ± standard deviation. Categorical variables are described by the percentage distribution of the occurrence of their individual values. Parameter distributions were assessed using Shapiro-Wilk test. In the case of categorical and quantitative variables the comparison of two groups was performed by using nonparametric Mann-Whitney test. Comparison of more than two groups was performed by Kruskall-Wallis test. A post hoc test was conducted to verify the existence of each intergroup difference. The study of differences between the two groups in terms of the distribution of qualitative variables was based on Pearson's chi-square test, and in the case of simultaneous comparisons of many groups Bonferroni correction to the p-value was applied. An examination of the relationship between quantitative and ordinal variables was based on Spearman's correlation rank test. As statistically significant, p value on the level below 0.05 was used.

The statistical analysis was done on the basis of Statistica for Windows version 8.0 and R packet.

Results

Study groups characteristics

A participants' characteristics are detailed in Table I. The study groups (A, CD, NFPA) and the control groups (P, HC) had dissimilar sociodemographic profiles in terms of age in years and gender, but the statistical analysis showed that in this study these were not influencing factors. The sociodemographic profiles in terms of education, place of residence, and marital status did not differ significantly between groups.

The whole study sample had a predominance of urban married females (61%) with a medium level of education (41%). The disease duration in the clinical groups did not differ significantly among endocrine sufferers. Only the psoriasis patients were characterised by a longer period of disease duration onset compared to other groups (Table I). The distribution of time from the first symptoms to the diagnosis varied significantly in between-group comparison. Patients with acromegaly were diagnosed significantly later after the onset of the first symptoms compared to the other groups.

The relationship between QoL, sociodemographic, clinical, and psychological factors

No correlation existed between the psychological and the sociodemographic factors. However, in acromegaly a relationship between psychopathological symptoms and gender was observed. Women had a greater tendency to develop psychopathological symptoms measured by the GHQ-28 ($Z = 1.96872$, $p = 0.05$).

The duration of illness was an associated factor in the clinical groups. The longer patients experienced chronic disease, the worse were their results in the Illness Acceptance Scale ($r = –0.2$, $p = 0.03$), but they showed fewer psychopathological symptoms (GHQ-28: $r = –0.3$, $p = 0.002$). In patients with acromegaly and in those with CD, no correspondence between the duration of illness and studied variables was observed. In patients with NFPA a negative correlation between the duration of illness and the occurrence of psychosomatic symptoms (GHQ-A: $r = –0.3$, $p = 0.047$) and disorders in social sphere (GHQ-C: $r = –0.3$, $p = 0.048$) was observed. The longer time of experiencing disease in patients with psoriasis correlated with the lower incidence of pathological symptoms in terms of anxiety and insomnia (GHQ-B: $r = –0.34$, $p = 0.03$).

The relationship between various QoL domains and acceptance of illness and the existence of psychopathological symptoms is shown in Table II. A better QoL score in all was associated with a better acceptance of illness and less psychiatric distress (GHQ-28). The strongest correlation was observed between psychological health (QoL) and acceptance of illness.

In acromegaly, the acceptance of illness was related to the QoL in the domains of psychological health and the environment. The physical health domain was related to the acceptance of illness only among NFPA patients. Moreover, there was a very consistent pattern of correlations between QoL and psychiatric distress. The strongest correlation was observed among patients with CD in all domains measured with WHOQoL-BREF. In patients with NFPA the psychiatric distress was related to physical and psychological health, in psoriasis with social relationships. In acromegaly, the psychological health

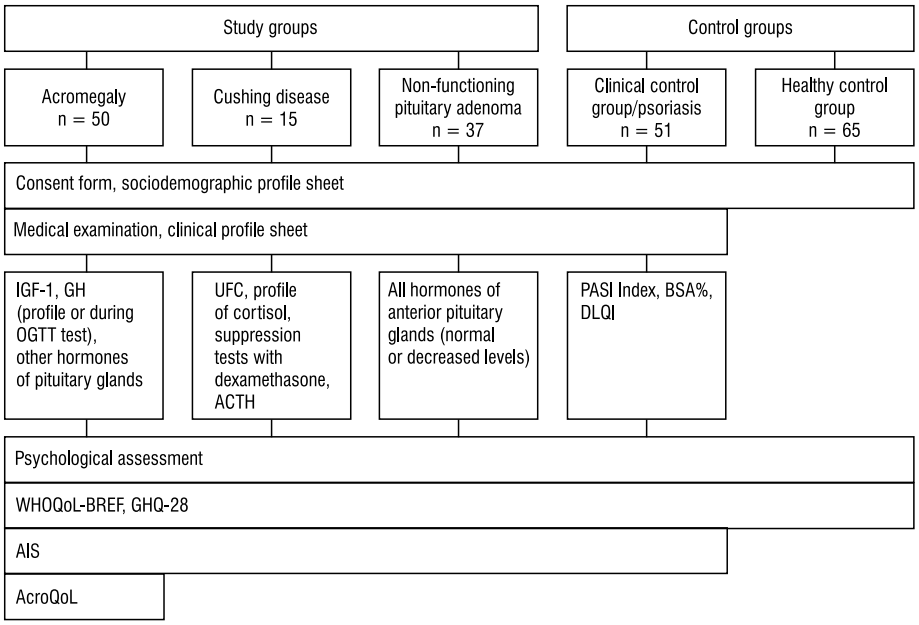

Figure 1. *Flow diagram of study procedure*
Rycina 1. *Schemat procedury badania*

Table II. *Correlations between WHOQoL-BREF scores and AIS and GHQ-28 scores in clinical groups*
Tabela II. *Korelacja pomiędzy WHOQoL-BREF (***WHO Quality of Life Scale-BREF***), AIS (***Acceptance of Illness Scale***) oraz GHQ-28 (***General Health Questionnaire-28***) w badanych grupach*

Variables		AIS		GHQ-28
WHOQoL-BREF	Groups	Spearman R	p-value	Spearman R
Physical Health	All	0.225	**0.005**	–0.311
	Acromegaly	0.212	0.139	–0.213
	CD	0.457	0.100	–0.653
	NFPA	0.341	**0.04**	–0.553
	Psoriasis	0.163	0.254	–0.216
Psychological Health	All	0.436	**0.000**	–0.339
	Acromegaly	0.343	**0.02**	–0.304
	CD	0.387	0.172	–0.765
	NFPA	0.539	**0.001**	–0.492
	Psoriasis	0.332	**0.02**	–0.359
Social Relation	All	0.184	**0.02**	–0.307
	Acromegaly	0.202	0.160	–0.017
	CD	0.079	0.789	–0.686
	NFPA	0.144	0.394	–0.151
	Psoriasis	0.070	0.623	–0.508
Environmental	All	0.280	**0.000**	–0.343
	Acromegaly	0.361	**0.01**	–0.281
	CD	0.291	0.313	–0.637
	NFPA	0.261	0.118	–0.292
	Psoriasis	0.163	0.252	–0.392

Table III. *Quality of life and psychopathological status of study participants*
Tabela III. *Jakość życia i objawy psychopatologicznne badanych grup*

WHOQoL-BREF	A (n = 50) Mean ± SD	CD (n = 15)	NFPA (n = 37)	P (n = 51)	HC (n = 65)	p-value	
Physical Health	55.28 ± 9.6	48.57 ± 12.9	56.11 ± 13.4	56.37 ± 12.3	60.48 ± 7.5	HC vs. CD	p = 0.009
Psychological Health	63.98 ± 10.9	52.86 ± 17.3	66.24 ± 11.2	55.12 ± 14.6	69.28 ± 8.6	A vs. P	p = 0.03
						HC vs. CD	p = 0.002
						NFPA vs. P	p = 0.005
						HC vs. P	p = 0.00000
Social Relation	69.40 ± 17.8	58.14 ± 24.4	69.95 ± 18.2	61.65 ± 21.6	79.40 ± 11.9	HC vs. A	p = 0.006
						HC vs. CD	p = 0.01
						HC vs. NFPA	p = 0.04
						HC vs. P	p = 0.000002
Environmental	69.82 ± 14.7	62.64 ± 14.7	67.05 ± 17.3	66.08 ± 14.2	69.72± 11.7		
GHQ-28	5.50 ± 5.8	9.53 ± 8.0	7.73 ± 7.2	4.59 ± 6.7	2.63 ± 3.5	HC vs. CD	p = 0.02
						HC vs. NFPA	p = 0.002
A — somatic symptoms	1.60 ± 2.1	2.86 ± 2.6	2.57 ± 2.0	1.39 ± 2.1	0.91 ± 1.4	P vs. NFPA	p = 0.03
						HC vs. NFPA	p = 0.001
B — anxiety and insomnia	2.16 ± 2.0	3.13 ± 2.5	2.68 ± 2.6	1.47 ± 2.1	0.97 ± 1.3	P vs. NFPA	p = 0.03
						HC vs. A	p = 0.03
						HC vs. CD	p = 0.03
						HC vs. NFPA	p = 0.02
C — social dysfunction	1.10 ± 1.6	1.60 ± 1.7	1.84 ± 2.2	0.94 ± 1.6	0.45 ± 0.9	HC vs. CD	p = 0.05
						HC vs. NFPA	p = 0.005
D — severe depression	0.62 ± 1.2	2.00 ± 2.3	1.15 ± 1.9	0.78 ± 1.5	0.32 ± 0.9	HC vs. CD	P = 0.03

and environmental domains were also associated with psychiatric distress, but the correlation was rather weak.

Quality of life and psychopathological status

The comparison of the QoL and psychiatric distress among the five groups is presented in Table III. Patients with acromegaly had significantly poorer QoL in social relations compared with healthy controls; however, these were still significantly better than in patients with psoriasis. Moreover, patients with acromegaly suffered more from anxiety and insomnia compared with healthy controls (Table III).

Figure 2 illustrates the percentage distribution in five study groups, in terms of the existence and absence of psychopathological symptoms (GHQ+/-). There were significant differences in the prevalence of psychopathological symptoms among CD and the HC groups (p = 0.009) and NFPA and HC (p = 0.01). The prevalence of psychopathological symptoms among acromegaly and psoriasis patients did not differ significantly compared to the HC.

Taking into account all chronic disease subjects the GHQ+ subgroup had significantly poorer QoL in the

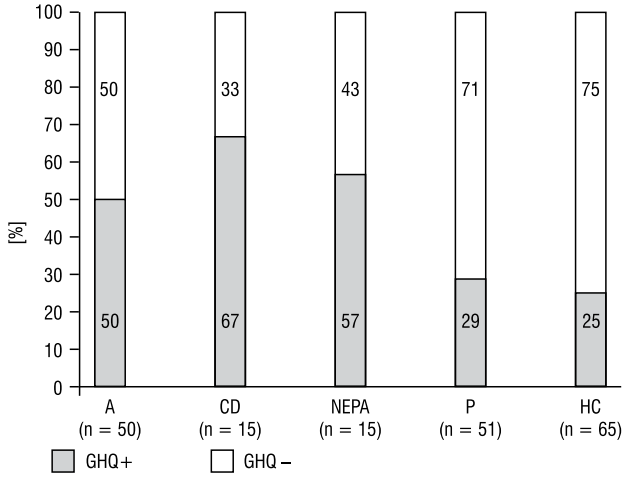

Figure 2. *The GHQ positive/negative percentage distribution in study groups*

Rycina 2. *GHQ pozytywny/negatywny rozkład w badanych grupach*

domains of physical health (Z = 3.9534, p = 0.00001), psychological health (Z = 3.8916, p = 0.0001), social relationship (Z = 3.5828, p = 0.0003), environmental factors

(Z = 3.8541, p = 0.0001), and acceptance of the illness (Z = 2.1530, p = 0.03). Interestingly, the acromegaly patients were the only group in whom the existence of the psychopathological symptoms was the same independently of patients' QoL and the acceptance of the disease (Table IV).

Acceptance of illness

The level of the acceptance of illness in four clinical groups is illustrated in Figure 3. The highest scores in terms of the acceptance of illness were obtained by patients with acromegaly and NFPA (31.96 ± 7.9 and 31.49 ± 8.0, respectively). The post hoc multiple comparisons test demonstrated a significant difference among patients with acromegaly and psoriasis (p = 0.009), and NFPA patients and psoriasis (p = 0.04).

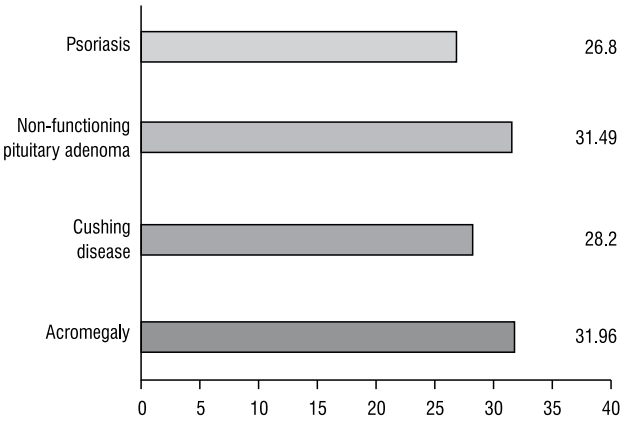

Figure 3. *Acceptance of illness in clinical groups*
Rycina 3. *Akceptacja choroby w badanych grupach*

Discussion

This is the first study evaluating psychiatric morbidity and QoL in patients with acromegaly, compared to other chronic diseases and healthy controls in Poland. The crucial finding is that patients with acromegaly scored worse in the social relation domain compared with the general population; however, the social dysfunctions did not differ significantly from those with other pituitary adenoma patients. The results pointed out the significantly higher symptomatology of anxiety and insomnia in patients with acromegaly compared to healthy controls, but still the results did not differ from those from other clinical groups. Interestingly, acromegaly patients had significantly greater QoL in psychological health than, for example, psoriasis patients. This result could be surprising because some previous studies showed that QoL in acromegaly is impaired not only in comparison with the general population but also with other chronic diseases such as asthma, angina, or osteoarthritis [5]. However, the highest psychopathological symptomatology and the lowest QoL are the characteristics of patients with CD. There are also observed: cognitive function impairment, circadian rhythm disturbances, and sleeping disorders. CD sometimes causes psychotic symptoms as a consequence of vasogenic and metabolic damage of brain structures and cerebral atrophy. The result of these complications is a decreased quality of life [31].

In this study, no correlation existed between psychological and psychopathological variables and the sociodemographics. Only acromegalic women had a greater tendency to develop the psychopathological symptoms, which is consistent with some previous studies [15, 32] but different from another study that showed more depression and distress in acromegalic males [33].

The prevalence of psychopathological symptoms among acromegaly patients did not differ significantly compared to healthy controls; however, the tendency towards mental morbidity was twice as high. A 35% prevalence of mental disorders in acromegaly was shown in a study from India [34], and a 62.5% prevalence of depression was observed in a Spanish sample [35]. In our study, a 50% prevalence of psychiatric distress was observed, most frequently occurring with anxiety and insomnia. The same observations were shown in a study from Germany. Sievers et al. (2009) showed that acromegalic patients suffered more from anxiety and they were more neurotic and had higher levels of pessimism, asthenia, and fatigue compared with healthy controls [35]. In our study, we observed significant differences in the prevalence of psychopathological symptoms (psychosomatic, anxiety, insomnia, and social dysfunction) among CD and HC, and NFPA and HC. In the CD group, we also observed a greater occurrence of severe depression. Miller et al. (2008) compared acromegaly, NFPA patients, and healthy subjects, and they did not observe any differences between acromegalics and the other two groups in terms of mental health and emotional status, but NFPA patients had worse scores in physical and social functioning and general health compared to acromegaly [36].

This study is the first one that addressed the acceptance of illness issues among patients with pituitary adenomas, which seems to be a significant correlate of QoL, as well as of psychopathological symptoms regardless the type of chronic disease. A correlation between the QoL and the acceptance of illness among all participants was observed. A better QoL score was associated with a better acceptance of illness and less

psychopathology, which should result in the interdisciplinary approach to a chronic disease, including psychological assessment.

Another important point deriving from this study is that patients with acromegaly are diagnosed significantly later, counting from the onset of the first symptoms, compared to patients from other clinical groups. 31% of the acromegaly patients had waited for diagnosis for more than 10 years. This finding is associated with the risk of uncontrolled development of the disease symptoms without implementing any treating standards, and hence to the development of the negative consequences associated with acromegaly.

The limitations of this work should be listed, including the cross-sectional study design, because the aim was to describe a population of chronic disease patients mainly focused on acromegaly, and not to make causal inference. Nevertheless, our results seem to be useful for public health planning and understanding disease psychopathological consequences and the role of individual psychological factors in the treatment process. What is more, the study groups were not matched concerning age and gender, but as the statistical analysis showed these factors transpired to be not influencing. Another limitation is not taking into account the medical history and biochemical parameters, which according to previous studies are relevant. However, due to the fact that the study sample consisted of various clinical subgroups, the authors decided to reduce the evaluation to psychological variables and the psychopathological status of patients.

Conclusions

The main findings were that acromegaly is related to higher symptomatology of anxiety and insomnia, and poorer social relationships compared with the general population but comparable to or even greater than in other severe chronic diseases. Interestingly, other QoL domains such as psychological, physical, and environmental do not differ from healthy controls. This may be connected with the acceptance of illness, which in our sample was rather high, and which seems to have a significant impact on the QoL, as well as on psychopathological symptoms. In the treatment process beyond the control of biochemical parameters the components of mental health associated with mood and the level of acceptance of the disease are crucial.

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