ACTA MEDICA LITUANICA. 2008. Vol. 15. No. 2. P. 99–103
© Lietuvos mokslų akademija, 2008
© Lietuvos mokslų akademijos leidykla, 2008
© Vilniaus universitetas, 2008

The quality of life and functional ability in patients with ankylosing spondylitis

Rita Rugienė[1],

Gailutė Kirdaitė[1, 2],

Edita Gražuleviciūtė[1],

Jolanta Dadonienė[1, 2],

Algirdas Venalis[1, 2]

[1] *Institute of Experimental and Clinical Medicine, Vilnius University, Lithuania*

[2] *Faculty of Medicine, Vilnius University, Lithuania*

Background. The main objective of this study is to understand the burden of ankylosing spondylitis (AS), to identify the aspects of health-related quality of life (QoL) in patients with AS and compare them with the control group (CG), to explore the factors influencing the QoL.

Methods. 65 patients with AS and 67 CG patients participated in this study matching by age, sex and education. The interview comprised socio-demographic questions, the range of disease duration, number of patients with peripheral arthritis, uveitis, comorbidities. The Bath ankylosing spondylitis functional index (BASFI), the Bath ankylosing spondylitis disease activity index (BASDAI), the Bath ankylosing spondylitis global health index (BASG) have been translated, adapted and used in this study. Finally, both groups were asked to fill in the SF-36 as generic QoL instrument. Disease duration time (6.7 years) in AS group was more than twice shorter than time duration of complaints (16 years). More than one third of the patients had uveitis and more than half of them had arthritis.

Results. QoL on all the scales of the SF-36, especially in physical health-related QoL, was significantly worse than in the CG. Disease-specific instruments – BASFI, BASDAI, BASG and pain – were significantly associated with the component of physical and mental health related QoL.

Conclusion. AS influences the subjective health of the affected person; especially the physical health related QoL. BASFI, BASDAI, BASG and pain are significantly associated with SF-36 physical and mental domains in patients with AS.

Key words: ankylosing spondylitis; quality of life; physical component summary, mental component summary

INTRODUCTION

Ankylosing spondylitis is a chronic, inflammatory rheumatic progressive disease. It usually affects the sacroiliac joints, the spinal column to a varying degree, and, to a smaller extent, the peripheral joints (1). The disease is about three times more common in men than in women and usually starts between the age of 20 and 40 (2). It may lead to major functional limitations not only because of spinal disease but also because of extra spinal disease manifestations such as peripheral arthritis, inflammatory bowel disease and uveitis (2, 3). Medical findings of AS are well known, but the overall impact of the disease on the subjective health of the affected person is relatively scarce (4). The main objective of this study was to understand the burden of this disease, using the scales for activity, functioning and global health, to identify the aspects of health-related quality of life that are most commonly affected in patients with AS and parallel with the control group, to explore the factors influencing the QoL.

Correspondence to: Rita Rugienė, Institute of Experimental and Clinical Medicine, Vilnius University, Žygimantų 9, LT- Vilnius, Lithuania.
E-mail: rita.rugiene@santa.lt

MATERIALS AND METHODS

The study was approved by the Lithuanian Bioethical Committee for Medical Research. 65 patients with AS and 67 control group patients (132 in total) participated in this study matching by age, sex and education. The AS patients were selected from the hospital rheumatology department and complied with the New York classification criteria for this disease (5). Patients with significant comorbidity such as psychiatric disorders or cancer were excluded. The interview comprised socio-demographic questions, disease duration and duration of complaints, number of patients with peripheral arthritis, uveitis, comorbidities, and lumbar spine anterior flexion-modified Schober symptom (<5 cm low spine mobility) was measured. The disease-specific instruments – the Bath ankylosing spondylitis functional index, the Bath ankylosing spondylitis disease activity index, the Bath ankylosing spondylitis global health index – were translated into Lithuanian according to a strictly defined protocol, adapted to cultural needs and used in this study (6, 7). The function measured by the BASFI comprises 10 questions, each to be rated on a visual analogue scale (VAS; 0–10), on perceived limitations in daily activities. The final score ranges from 0 to 10, and higher values indicate worse physical function (8). The BASDAI consists of six questions focusing on fatigue (one item), axial pain (one item), peripheral pain (one

Janssen Biotech, Inc.
Exhibit 2093
Accord v. Janssen
IPR2026-00259
Ex. 2093-001

item), enthesopathy (one item), and morning stiffness (two items). Each question was scored on a visual analogue scale. The BASDAI score (0–10) was calculated as the mean value of the mean of the first four items and the mean of the last two items referring to morning stiffness. A higher score indicates higher disease activity. Three levels of disease activity were defined: a score <4 meant mildly active disease, a score of 4–6 indicated moderate disease activity, and a score of >6 defined severe disease activity (9). The BASG consists of two questions concerning the impact of AS on global wellbeing in the past week and in the past six months. Each question was scored on a VAS, the mean of which gave the BASG score (0–10). A higher score indicates more impact of the disease on the global wellbeing of the patient. Patient's global wellbeing, global and spinal pain were measured by a 10 cm visual analogue scale (10). The score range is from 0 (best) to 10 (worst).

The control group comprised the group of people without inflammatory joint and spine diseases. They were asked socio-demographic questions and about comorbidities. Finally, both AS patients and the control group were asked to fill in the SF-36 as generic quality of life instrument. The Medical Outcomes Study Short Form 36 Health Survey (SF-36) is a generic instrument providing information about eight different aspects of subjective health. The questionnaire SF-36 is divided into eight domains: physical functioning, role limitation due to physical problems, role limitation due to emotional problems, bodily pain, social functioning, mental health, vitality, and general health perception. To reduce the number of statistical comparisons on the basis of these separate subscales, physical component summary (PCS) and mental component summary (MCS) were calculated (11). The scales and summary scores may vary from 0 to 100, with lower scores indicating a worse health status. The instrument was translated into Lithuanian and validated. It performed well in patients with rheumatoid arthritis (RA) and in the control group (12).

Table 1 shows the socio-demographic and disease characteristics of 65 AS patients and that of 67 control group people. Age ranged from 21 to 76 years in the AS group and from 19 to 73 years in the control group. The mean age, gender proportion and years of education of the AS patients and of the control group were not significantly different. Disease duration time (6.7 years) in the AS group was more than two times shorter than the duration of complaints (16 years). 60% of AS patients were still employed. 67.7% of patients had peripheral arthritis and 35.4% had uveitis. More than 10% comorbidities were present in the AS group. Disease-specific instruments – BASFI, BASDAI, BASG and pain (VAS) were measured in grade 5 or over 5. Schober symptom was 2.8 cm or lower.

The data were analyzed using the standard SPSS for Windows, version 12 (13). Patient characteristics were summarized by means of descriptive statistics. Differences between the AS patients and the control group were examined by χ^2 test for categorical variables and t test for continuous variables. The median of PCS (median 29.8) and median of MCS (median 40.8) were considered as discriminating point. Those lower than particular median were considered to have worse scores in PCS and MCS while the rest were having better PCS or MCS. Two sample independent t-test was used for comparing the socio-demographic and disease characteristics, and χ^2 test for dichotomous variables between two patient groups with lower and higher QoL. Multivariate logistic regression was applied to assess factors which may have influenced PCS and MCS QoL characteristics in AS patients. Only variables statistically significant in the univariate analysis were entered into the model. The level of significance was set to 0.05.

RESULTS

Quality of life in all domains of the SF-36 was significantly worse if compared to the control group (Table 2). Negative impact of ankylosing spondylitis on patients has been stated in all 8 QoL scales, and especially in the scales reflecting physical categories.

Socio-demographic, clinical factors, such as age, sex, education in years, employment, disease duration and duration of complaints, peripheral arthritis, uveitis, comorbidities, were not significantly different in univariate statistics, when comparing

Table 1. **The demographic and disease characteristics of patients with ankylosing spondylitis (AS) and that of the control group (CG)**

Characteristics	AS (n = 65)	CG (n = 67)	p
Age (years), mean (SD)	44.5 (13.7)	44.9 (14.9)	0.89
Men (%)	55 (84.7%)	57 (85.1%)	0.91
Education in years, mean (SD)	12.7 (3.6)	12.9 (3.9)	0.68
Employed (%)	39 (60.3%)	53 (79.1%)	0.06
Disease duration (years), mean (SD)	6.7 (8.6)	–	–
Duration of complaints (years), mean (SD)	16.0 (9.8)	–	–
Peripheral arthritis (%)	44 (67.7%)	–	–
Uveitis (%)	23 (35.4%)	–	–
Comorbidities (%)	54 (83.1%)	47 (70.1%)	0.48
Functional index (BASFI 0–10), mean (SD)	5.0 (2.5)	–	–
Disease activity index (BASDAI, 0–10), mean (SD)	5.4 (2.0)	–	–
Global health index (BASG, 0–10), mean (SD)	6.5 (1.9)	–	–
Pain (VAS, 0–10), mean (SD)	6.7 (2.3)	–	–
Schober symptom (<5 cm), mean (SD)	2.8 (2.2)	–	–

SD – standard deviation

Ex. 2093-002

Table 2. **Quality of life characteristics of patients with ankylosing spondylitis (AS) and that of the control group (CG)**

Characteristics	AS (n = 65), mean (SD)	CG (n = 67), mean (SD)	p
Physical functioning	41.5 ± 20.7	76.3 ± 9.9	<0.001
Physical role	24.2 ± 35.6	85.1 ± 25.4	<0.001
Bodily pain	35.8 ± 19.4	82.7 ± 16.9	<0.001
General health	38.3 ± 13.0	61.0 ± 13.2	<0.001
Vitality	46.5 ± 9.6	52.8 ± 9.0	<0.001
Social functioning	58.3 ± 23.3	86.0 ± 19.3	<0.001
Emotional role	54.9 ± 44.7	86.6 ± 25.3	<0.001
Mental health	37.8 ± 9.0	43.1 ± 8.6	0.01

SD – standard deviation

Table 3. **The summary of factors affecting both physical and mental health QoL of 65 patients with ankylosing spondylitis**

Factors	Physical component summary		Mental component summary	
	OR – CI	p	OR – CI	p
Pain (VAS, 0–10)	0.67 (0.51–0.87)	0.003	0.74 (0.58–0.95)	0.018
Schober symptom (<5 cm)	1.30 (1.01–1.63)	0.036	–	–
Bath ankylo-sing spondylitis global health index	0.57 (0.40–0.80)	0.001	0.69 (0.5–0.94)	0.018
Bath ankylo-sing spondylitis disease activity index	0.42 (0.27–0.65)	<0.001	0.76 (0.58–1.0)	0.044
Bath ankylo-sing spondylitis functional index	0.54 (0.4–0.73)	<0.001	–	–

OR – odds ratio, CI – confidence interval

AS and control groups with better and worse counts of physical and mental health QoL. Only the variables statistically significant between the groups with better and worth QoL were entered into logistic regression analysis, including pain (VAS), Schober symptom, the Bath ankylosing spondylitis global health index, the Bath ankylosing spondylitis disease activity index, the Bath ankylosing spondylitis functional index.

According to the logistic regression method being used to analyse AS patients' data, factors determining worse physical and mental health of QoL are intensive bodily pain (VAS) and higher indexes of disease-specific instruments, such as the Bath ankylosing spondylitis global health index and the Bath ankylosing spondylitis disease activity index (Table 3). Low spine mobility and higher Bath ankylosing spondylitis functional index are among the factors determining worse physical health of QoL in addition to the mentioned ones.

DISCUSSION

In our study most patients with AS were middle-aged men. The largest number of patients had higher than secondary education and were employed. More than one third of the patients with AS had uveitis and more than half had peripheral arthritis. These findings coincided with the data in literature (1, 4, 14). In our study 82.5% patients with AS had such comorbidities as osteoporosis, stomach ulcer, hypertension which influence not only the functional limitation, pain and wellbeing of the patients but also their quality of life. Our study showed that all key dimensions of health were affected by AS. The results of the present study demonstrated a reduced health-related quality of life in patients with AS. Compared to the control group, all the results for the 8 scales of SF- 36 were significantly worse for AS patient.

In multivariate logistic regression it has been determined that the patients who had significantly lower spine mobility, suffered from more intensive pain, and whose indexes of AS specific instruments, such as BASG, BASDAI, and BASFI, were higher had higher risk of worse physical health QoL. The higher risk of worse QoL mental health was among the patients who suffered from most intensive pain, and whose indexes of BASG and BASDAI were higher.

AS is a young men's disease (1). The burden of illness in AS results from pain, reduced function, and impaired wellbeing (15, 16). Our study elucidated that chronic, inflammatory AS disease clearly influenced the subjective health of the affected person, especially the physical health-related QoL, and this finding was supported by other studies (14, 17). A longitudinal cross-sectional survey of 175 patients with AS identified the aspects of the disease that adversely affected the quality of life (18). In a direct comparison of functional disability and pain among patients with RA and AS registered in the German rheumatologic database, among men of the same age groups, the rate of severe functional disability was higher in AS than in RA (17). Ward (18) stated that in addition to pain and stiffness, fatigue and sleep problems were important concerns in patients with AS, while a few reported problems were associated with mood or social relationships. He also noted that functional disability in AS patients progressed with age. Boonen et al. (19, 20) reviewed the QoL and work status in patients with ankylosing spondylitis and found work to be an important independent external determinant of the physical health-related QoL, but not of the mental

health-related QoL. Bostan et al. (15) ascertained that the effect of AS depended on peripheral involvement, especially in case when the disease was active. According to our study such important factors as sex, education, work status, peripheral arthritis and uveitis do not have significant influence on SF-36 domains.

There are few studies suggesting a relationship between QoL and functional status in AS patients (8, 15, 17). Bostan et al. (15) stated that disease activity and metrological index scores (particularly the modified Schober test) were the strongest variables predicting functional disability. They suggested that physical domains of QoL related more strongly to functional loss, whereas psychosocial domains correlated best with disease activity levels.

Our study elucidated that disease-specific instruments – pain, Schober test, BASFI, BASDAI, BASG – deeply reflected functional limitation, disease activity, the effect of AS on the patients' wellbeing and were significantly associated with the component of physical and mental health related QoL. They directly affected the subjective health in patients with AS and should be considered in clinical practice.

Current treatment strategies should focus on decreasing pain, maintaining physical activity, and efforts should be paid to improve psychosocial health aspects for increasing QoL in AS patients.

CONCLUSION

1. Ankylosing spondylitis had negative impact on patients' quality of life. Compared to the control group, all the results on the 8 scales, especially the physical health related QoL, were significantly worse for AS patients.

2. Intensive bodily pain, low spine mobility and higher indexes of disease-specific instruments, such as the Bath ankylosing spondylitis functional index, the Bath ankylosing spondylitis global health index and the Bath ankylosing spondylitis disease activity index, are factors determining worse physical health of QoL.

3. Intensive bodily pain and higher scores of the Bath ankylosing spondylitis global health index and the Bath ankylosing spondylitis disease activity index are factors determining worse mental health of QoL.

Received 2 July 2007
Accepted 4 April 2008

References

1. Sieper J, Braun J, Rudwaleit M, Boonen A, Zink A. Ankylosing spondylitis: an overview. Ann Rheum Dis 2002; 61(Suppl 3): iii8–18.
2. Braun J, van der Heijde D, Dougados M, Emery P, Khan MA, Sieper J, van der Linden S. Staging of patients with ankylosing spondylitis: a preliminary proposal. Ann Rheum Dis 2002; 61(Suppl 3): iii9–23.
3. Haywood KL, Garratt AM, Dawes PT. Patient-assessed health in ankylosing spondylitis: a structured review. Rheumatology (Oxford) 2005 May; 44(5): 577–86.
4. Dagfinrud H, Mengshoel AM, Hagen KB, Loge JH, Kvien TK. Health status of patients with ankylosing spondylitis: a comparison with the general population. Ann Rheum Dis 2004; 63(12): 1605–10.
5. Moll J M. New criteria for the diagnosis of ankylosing spondylitis. Scand J Rheumatol Suppl 1987; 65: 12–24.
6. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. J Clin Epidemiol 1993; 46(12): 1417–32.
7. Doward LC, McKenna SP, Meads DM, Twiss J, Revicki D, Wong RL, Luo MP. Translation and validation of non-English versions of the Ankylosing Spondylitis Quality of Life (ASQOL) questionnaire. Health Qual Life Outcomes 2007; 2: 5–7.
8. Dougados M, Gueguen A, Nakache JP, Nguyen M, Mery C, Amor B. Evaluation of a functional index and an articular index in ankylosing spondylitis. J Rheumatol 1988; 15: 302–7.
9. Heuft-Dorenbosch L, van Tubergen A, Spoorenberg A, Landewe R, Dougados M, Mielants H, van der Tempel H, van der Heijde D. The influence of peripheral arthritis on disease activity in ankylosing spondylitis patients as measured with the Bath Ankylosing Spondylitis Disease Activity Index. Arthritis Rheum 2004; 51(2): 154–9.
10. Jones SD, Steiner A, Garrett SL, Calin A. The Bath Ankylosing Spondylitis Patient Global Score (BAS-G). Br J Rheumatol 1996; 35(1): 66–71.
11. Ware JE Jr, Kosinski M, Bayliss MS, McHorney CA, Rogers WH, Raczek A. Comparison of methods for the scoring and statistical analysis of SF-36 health profile and summary measures: summary of results from the Medical Outcomes Study. Med Care 1995; 33(Suppl 4): AS264–79.
12. Rugiene R, Dadoniene J, Venalis A. Adaptation of health-related quality of life ("SF-36") questionnaire, its validation and assessment of performance for control group and patients with rheumatoid arthritis. Medicina 2005; 41: 232–9.
13. Levesque R. A Guide for SPSS and SAS Users. SPSS Programming and Data Management, 4th Editon. SPSS Inc. 2007.
14. Ariza-Ariza R, Hernandez-Cruz B, Navarro-Sarabia F. Physical function and health-related quality of life of Spanish patients with ankylosing spondylitis. Arthritis Rheum 2003 15; 49(4): 483–7.
15. Bostan EE, Borman P, Bodur H, Barca N. Functional disability and quality of life in patients with ankylosing spondylitis. Rheumatol Int 2003; 23(3): 121–6.
16. Dalyan M, Guner A, Tuncer S, Bilgic A, Arasil T. Disability in ankylosing spondylitis. Disabil Rehabil 1999; 21(2): 74–9.
17. Zink A, Braun J, Listing J, Wollenhaupt J. Disability and handicap in rheumatoid arthritis and ankylosing spondylitis – results from the German rheumatological database. J Rheumatol 2000; 27: 613–22.
18. Ward MM. Health-related quality of life in ankylosing spondylitis: a survey of 175 patients. Arthritis Care Res 1999; 12: 247–55.

19. Boonen A, Chorus A, Miedema H, van der Heijde D, Landewé R, Schouten H et al. Withdrawal from labour force due to work disability in patients with ankylosing spondylitis. Ann Rheum Dis 2001; 60: 1033–9.
20. Chorus AM, Miedema HS, Boonen A, van der Linden S. Quality of life and work in patients with rheumatoid arthritis and ankylosing spondylitis of working age. Ann Rheum Dis 2003; 62(12): 1178–84.

Rita Rugienė, Gailutė Kirdaitė, Edita Gražulevičiūtė, Jolanta Dadonienė, Algirdas Venalis

ANKILOZINIU SPONDILITU SERGANČIŲJŲ FUNKCINĖ BŪKLĖ IR GYVENIMO KOKYBĖ

Santrauka

Tikslas. Įvertinti ir palyginti ankloziniu spondilitu sergančiųjų ir kontrolinės grupės gyvenimo kokybę bei jai įtakos turinčius veiksnius.

Medžiaga ir metodai. Tyrime dalyvavo 65 ankloziniu spondilitu sergantys ligoniai ir 67 uždegiminėmis sąnarių ligomis nesergantys asmenys, sudarę kontrolinę grupę. Sergantieji ankloziniu spondilitu atsakė į klausimus apie socialinę ir demografinę padėtį, buvo nustatytas laikotarpis nuo pirmųjų ligos simptomų, ligos trukmė, lydinčios ligos ir periferiniu sąnarių uždegimu bei uveitu sirgusių ligonių skaičius. Šiame tyrime buvo išversti, pritaikyti ir panaudoti ankloziniam spondilitui vertinti skirti klausimynai – funkcijos (the Bath ankylosing spondylitis functional index), ligos aktyvumo (the Bath ankylosing spondylitis disease activity index) ir bendros sveikatos būklės (the Bath ankylosing spondylitis global health index). Abi tiriamųjų grupės užpildė gyvenimo kokybės klausimyną „SF-36“ (Medical Outcomes Study Short Form-36).

Rezultatai. Ankloziniu spondilitu sergančiųjų ligos trukmė (6,7 m.) yra perpus trumpesnė už laikotarpį nuo pirmųjų ligos simptomų (16 m.). Daugiau kaip trečdalis ligonių yra sirgę uveitu, daugiau kaip pusė – periferiniu artritu. Visose srityse, ypač atspindinčiose fizines kategorijas, ankloziniu spondilitu sergančiųjų grupės gyvenimo kokybė statistiškai patikimai blogesnė negu kontrolinės grupės. Nustatytas patikimas ryšys tarp ankloziniu spondilitu sergančiųjų funkcijos, ligos aktyvumo, skausmo, bendros sveikatos būklės ir fizinę bei psichinę sveikatą atspindinčių gyvenimo kokybės sričių vertinimo.

Išvados. Ankilozinis spondilitas neigiamai veikia sergančiųjų gyvenimo kokybę, ypač jų fizinę sveikatą. Minėti funkcijos, ligos aktyvumo, skausmo, bendros sveikatos būklės klausimynai patikimai atspindi sergančiųjų subjektyvią sveikatą ir turi patikimą ryšį su gyvenimo kokybės sritimis.

Raktažodžiai: ankilozinis spondilitas, gyvenimo kokybė, fizinės sveikatos balai, psichinės sveikatos balai

Ex. 2093-005