

Pediatric rheumatology

Disability impact on quality of life in Mexican adults with juvenile idiopathic arthritis and juvenile ankylosing spondylitis

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Abstract

Objective

Our aim was to determine the disability impact on quality of life (QOL) in Mexican adults with juvenile idiopathic arthritis polyarticular course (JIAPA) and juvenile ankylosing spondylitis (JAS).

Methods

A cross-sectional study was performed on 32 adult patients with juvenile idiopathic arthritis. Functional outcome was evaluated using Global Functional Status (GFS) according to American College of Rheumatology (ACR) and Spanish Health Assessment Questionnaire-Disability Index (HAQ-DI) arthritis-specific measurements for functional disability in patients with polyarticular course and Bath Ankylosing Spondylitis Functional Index (BASFI) for those who developed JAS. Quality of life (QOL) was assessed using SF-36 and EuroQol 5D (EQ-5D). Descriptive statistics and associations among clinical, functional, and QOL measurements were examined using Spearman's correlation test. Multiple regression analysis was used to estimate predictor factors for impaired QOL. Differences between groups were evaluated by Fisher exact and Mann-Whitney U tests, and p values of <0.05 were considered statistically significant.

Results

JIAPA and JAS had GFS III/IV in 65 and 50%, respectively. A HAQ-DI score of > 1.5 was found in 35% of JIAPA, and a BASFI score of > 5 in 92% of JAS. Patients with JIAPA and JAS reported lower scores for all physical domains and for mental domains (physical role, social functioning, and emotional role) compared with Mexican population scores ($p < 0.005$). Health status between both groups studied does not show significant differences ($p > 0.05$). EQ-5D showed impairment in all five dimensions for both groups studied. Multiple regression analysis showed that GFS was the only variable that affects QOL assessed by SF36.

Conclusions

In our study population, JIAPA and JAS exhibited a great disability impact on QOL and poor functional outcome during the patients' adult life. GFS has a significant impact on quality of life.

Key words

Juvenile idiopathic polyarticular arthritis, juvenile ankylosing spondylitis, functional outcomes, quality of life.

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Introduction

Juvenile idiopathic arthritis (JIA) is a complex inflammatory rheumatic disease considered the most frequent chronic disease in childhood and an important cause of disability. A considerable number of patients enter adulthood with severe physical disability. The percentage of patients who have severe functional limitation (Steinbrocker functional class III/IV) ranges from 5-37% (1-3). Long-term JIA outcome studies show that length of follow-up is extremely important when identifying the long-term outcome. Laaksonen (4) demonstrated that the number of patients in functional classes III and IV increased from 12% at 3-7 years from onset to 48% after 16 years. Furthermore, there is a tendency toward greater functional disability and pain with longer disease duration (5).

Few outcome studies in adults with JIA to date have addressed the impact of disability on quality of life (QOL) (5-9). Such studies have demonstrated impaired physical health (7), physical and psychosocial impairment (8), worse psychological outcome related with disability (6), and a profound effect on generic health status and QOL (9). The aim of this study was to detail clinical and functional information on Mexican adult patients with long-standing JIA in agreement with the recent World Health Organization/International League Against Rheumatism (WHO/ILAR) Classification (10), as well as to evaluate the impact of JIA on the QOL of individuals with severe disease.

Patients and methods

Patients

All patients were included from May 2003 to May 2004. Of a cohort of 60 out-patients reclassified with JIA according to ILAR criteria (10) patients > 18 years of age were identified and requested to sign an informed consent form. A structured questionnaire was applied to obtain the following information: Sociodemographic characteristics; previous medical history including onset of JIA and sub-type during disease course; time between onset and diagnosis; disease duration; medication used during the first 2 years including

corticosteroids and disease-modifying anti-rheumatic drugs (DMARDs); current medication use, and previous joint surgery. Follow-up diagnosis of juvenile ankylosing spondylitis (JAS) was assigned to patients who fulfilled modified New York criteria (11).

Rheumatologist assessment

Clinical examination included an assessment of 1) painful, swollen, and restricted joint counts, and 2) a 10-cm Visual analog scale (VAS) for Physician global assessment scale of disease activity, pain, and health perception, in which 0 represents no disease activity, no pain, or very good health perception, and 10 represents severe disease activity, greatest pain, or worst health perception. Independently, all patients completed VAS for pain and health perception based on their experience in the week prior to the clinical assessment. VAS score > 1 defines active disease, pain, or impaired health perception.

Health status assessments

Disability was evaluated by the following instruments:

1) *Global Functional Status (GFS)* a functional limitation questionnaire [American College of Rheumatology 1991 revised criteria] (12), in which GFS was divided into three categories including GFS I: no functional impairment, GFS II: mild or moderate functional impairment, and GFS III-IV: severe functional impairment;

2) *the Spanish Health Assessment Questionnaire-Disability Index (HAQ-DI)*, a disease-specific instrument that assesses functional ability in nine domains of activities of daily living (13), each question scored from 0-3 (0 = no difficulty, 1 = some difficulty, 2 = much difficulty, 3 = unable to do). Finally, the sum of the component score is averaged and referred to as the Disability Index (DI). The DI ranges from 0 (no disability) to 3 (most severe disability). JIA patients with polyarticular disease course responded to HAQ-DI. The HAQ-DI was divided into four categories according to functional disability (5): 0 = none; 0.1-0.5 = mild; 0.6-1.5 = moderate, and > 1.5 = severe disability;

3) *the Bath Ankylosing Spondylitis*

Competing interests: none declared.

Functional Index (BASFI) (14). This instrument has eight questions focused on discerning axial mobility and lower extremity-dependent activities and two questions that assess daily living activities (total, 10 items). Each question is rated on a 10-cm VAS that ranges from 0 = easy to do to 10 = impossible to do; mean of the 10 scales gives the BASFI score. JIA patients who developed juvenile ankylosing spondylitis (JAS) responded to BASFI. Then, the BASFI score was divided into three categories (15), including 0 = no functional impairment, 1-5 = mild or moderate, and > 5 = severe functional impairment. Quality of life (QOL) was assessed by the following two self-reported generic instruments:

1) *The Medical Outcome Study 36-item Short-Form Study (SF-36)*, which measures eight health dimensions comprising general health, physical functioning, body pain, vitality, role limitations due to physical health, social functioning, role limitations due to emotional health, and mental health. Each dimension was scored from 0-100, where 0 means poor and 100 means excellent health (16).

SF-36 has been validated in the Mexican population (17);

2) *the EuroQol-5D (EQ-5D)* Spanish version, a multidimensional measurement of health-related quality of life according to a 5-dimensional classification (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression). Each dimension is composed of three levels: level 1 = no problem; level 2 = moderate problems, and level 3 = extreme problems (18).

Statistical analysis

For purposes of analysis, the patients were divided into two groups: 1) the JIA polyarticular (JIAPA) group, and 2) juvenile ankylosing spondylitis (JAS) group. Descriptive analysis was employed. Spearman's correlation test among clinical functional disability and QOL measurements including sub-analysis SF-36 for physical and mental sub-scales were performed. Multiple regression analysis was used to identify QOL predictor factors. Differences between groups were evaluated by Fisher exact and Mann-Whitney *U* tests, and *p* values < 0.05 were consid-

ered statistically significant. For SF-36 assessment, a control group was considered and comprised 170 Mexican non healthcare-seeking volunteers with no chronic illness (17).

Results

Thirty-two patients were included in the study. JIA sub-types were represented as follows: 16 had polyarticular onset; nine patients had oligoarticular onset (five with persistent disease and four with extended disease), and seven patients had enthesitis-related arthritis. During the disease course, 16 patients with polyarticular onset and four patients with oligoarticular-onset extended disease had a polyarticular course, 17 had rheumatoid factor positive (JIAPA group); five patients with oligoarticular-onset persistent disease and seven with enthesitis-related arthritis developed juvenile ankylosing spondylitis (JAS group).

There were 20 patients in the JIAPA group and 12 in the JAS group. Significant differences in sociodemographic and clinical characteristics are shown in Table I.

Table I. Disease characteristics of adult patients with childhood arthritis.

	JIAPA group n = 20 (%)	JAS group n = 12 (%)	<i>p</i>
Female/male	17/3	2/10	0.002
*Age at present (years)	25.8 ± 7.3	26.8 ± 5.2	NS
*Age at disease onset (years)	9.4 ± 3.6	12.6 ± 2.9	0.014
*Age at diagnosis (years)	11.6 ± 4.0	16.2 ± 3.2	0.002
*Time between disease onset and diagnosis (years)	2.9 ± 3	3.1 ± 2.4	NS
*Disease duration (years)	16.2 ± 7.6	13.6 ± 6	NS
Previous joint surgery	7 (35)	9 (75)	0.02
Corticosteroids ≤ 2 years	6 (30)	3 (25)	NS
Corticosteroids currently	7 (35)	1 (8.3)	NS
DMARDs ≤ 2 years	2 (10)	1 (8.3)	NS
DMARDs currently	17 (85)	11 (91.6)	NS
*Educational achievement	10.8 ± 3	8.4 ± 2	<i>p</i> = 0.03
Disease-attributed unemployment	12 (60)	8 (66)	NS
Unmarried	18 (90)	12 (100)	NS
**Number of joints			
Painful	3.4/2	0.8/1	0.04
Swollen	2/1	0.4/0	0.05
Restricted	15/14.5	5/3	0.003

*Mean ± standard deviation (SD) years; **mean/median; NS: not significant; JIAPA: polyarticular juvenile idiopathic arthritis; JAS: juvenile ankylosing spondylitis; DMARDs: disease-modifying anti-rheumatic drugs.

Rheumatologist assessment

The number of painful, swollen, or restricted joints was higher in the JIAPA group (Table I). VAS physician global assessment scale of disease activity reported active disease (VAS > 1) in 55% of patients in the JIAPA group vs. 33.3% in the JAS group. VAS physician global assessment scale correlated with VAS patient self-assessment with an *r* value of 0.738 (*p* = 0.000) for pain and 0.757 (*p* = 0.000) for health perception.

Health status assessment by outcome measurements

1) *GFS*, JIAPA, and JAS had GFS III-IV, 65 and 50%, respectively. Twenty-five percent of each group had GFS II, while 10% of the JIAPA group and 25% of the JAS-group patients had GFS I. There were no significant differences between both groups (*p* = 0.07).

2) *HAQ-DI*. The highest HAQ-DI score (> 1.5) was found in 35% of JIAPA-group patients, and 10% of patients reported a HAQ-DI score of 0.

3) *BASFI*. The highest BASFI score > 5

was found in 92% of JAS-group patients; 8% reported a BASFI score of 0. A statistically significant correlation was found between GFS and HAQ-DI ($r = 0.858$, $p = 0.00$) and GFS and BASFI ($r = 0.608$, $p = 0.00$). In addition, there was a correlation with GFS and clinically related parameters, such as number of painful ($r = 0.379$, $p = 0.038$), swollen ($r = 0.377$, $p = 0.034$), and restricted joints ($r = 0.727$, $p = 0.000$).

Quality of Life (QOL)

1) *SF-36*. SF-36 data of patients with JIAPA compared with those with JAS and controls are shown in Figure 1. Results showed a major impact of JIA on health status in both JIAPA and JAS groups studied, reporting lower scores for all physical domain scales (general health, physical functioning, vitality, and body pain) and for physical role, social functioning, and emotional role in the mental domain compared with Mexican population scores used as controls ($p < 0.005$). Cases and controls reported similar scores of mental health. A comparison of health scales between JIAPA and JAS showed no significant differences. Patients reported 0 in physical functioning (8/3 patients with JIAPA and JAS, respectively), in emotional role 10/4 patients, and in both physical and emotional roles, 8/1 patients. No patient scored 0 in body pain. Table II shows that all functional measurements employed to evaluate disability, GFS, HAQ-DI, and BASFI were strongly correlated with scales related with the physical functioning and body pain of the SF-36 physical domain, while there was no correlation with any scale related with mental domain.

2) *EQ-5D*. Significant differences were not found between groups (mobility, $p = 0.370$; self-care, $p = 0.291$; usual activities, $p = 0.07$; pain/discomfort, $p = 0.09$, and anxiety/depression, $p = 0.377$). EQ-5D showed correlation with GFS (mobility, $r = 0.669$, $p = 0.000$; self-care, $r = 0.544$, $p = 0.001$; usual activities, $r = 0.641$, $p = 0.000$, and pain/discomfort, $r = 0.365$, $p = 0.04$); there was no significant correlation with anxiety/depression. As shown in Table III, GFS was the only variable that exerted an impact on quality of life assessed by SF-36.

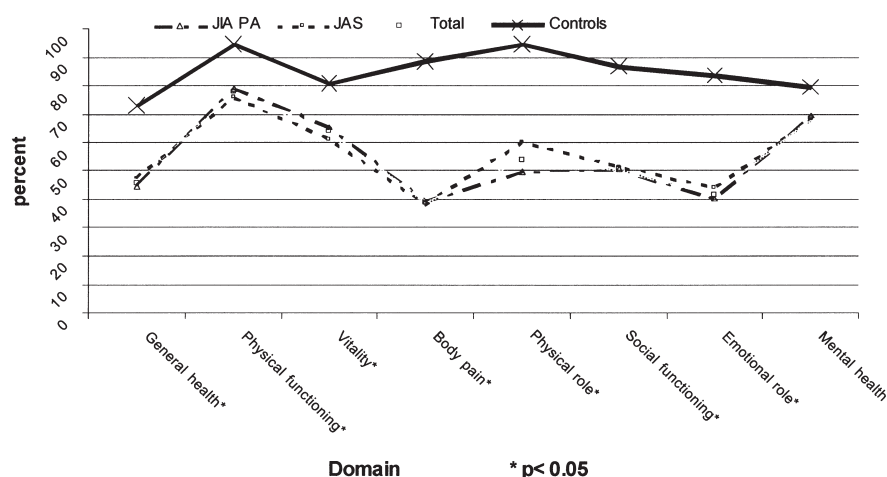


Fig. 1. Quality of life measured by the SF-36 in adults with childhood arthritis JIA PA compared with JAS and controls.

JIA PA: polyarticular juvenile idiopathic arthritis; JAS: juvenile ankylosing spondylitis. The higher the score, the better the quality of life for that particular domain. SF-36: Short-form 36.

Table II. Correlations among GFS, HAQ-DI, and BASFI with SF-36 physical domain scales.

	Physical	R	p
GFS	Physical functioning	0.636	0.000
	Body pain	0.468	0.007
HAQ-DI	Physical functioning	0.800	0.000
	Body pain	0.513	0.01
BASFI	Physical functioning	0.454	0.01
	Body pain	0.661	0.000

GFS: Global functional status; HAQ-DI: Health Assessment Questionnaire-Disease Index, BASFI: Bath Ankylosing Spondylitis Functional Index; SF-36: Short-form 36.

Discussion

For polyarticular disease, the percentage of patients with severe functional impairment (Steinbrocker classes III/IV classification) decreased from 15-20% in the 1970s, from 14-25% in the 1980s, and from 5-12% in the 1990s (19-25). For systemic sub-type, patient frequency in classes III/IV ranged from 22-40% in the 1970s, from 14-31% in the 1980s, and 0% in a single study in the 1990s (17-24). However, in 2001 reported percentages ranged from 19-29%, reflecting the heterogeneity of this particular JIA sub-type (24, 26). For oligoarticular JIA, it is more difficult to generalize outcome because this sub-group includes patients with extended disease course, considered to have a worse long-term outcome than patients with persistent oligoarthritis course. Studies conducted over 10 years published for Steinbrocker III/IV

reported from 36-43% for extended oligoarthritis and from 0-7% for persistent oligoarthritis (1-3, 27). Furthermore, enthesitis-associated JIA, a sub-group proposed in the most recent classification criteria for chronic arthritis in childhood ILAR 1998 (10) and that was previously included in the pauciarticular arthritis sub-type of ACR JRA 1977 (28) or EULAR JCA 1987 (29) shares many similarities with spondyloarthropathies, and indeed a certain proportion of patients develop sacroiliitis over time (7, 30).

In this study, our patients with JIA are not representative of the spectrum of JIA sub-types. This is biased by the severe sub-types of the disease spectrum, with a greater proportion of patients with polyarticular pattern and RF-positive, oligoarticular-onset, and enthesitis-related arthritis who subsequently evolve into JAS.

Table III. Multiple regression analysis with different SF-36 domains. GFS was the only significative variable.

Variable	B	S.E.	R	R ²	Sig.	Exp (B)
GFS	-1.281	.678	0.157	0.297	.059	.278

Variables entered in multiple regression model by conditional forward stepwise (p value < 0.05); Global Functional Status (GFS): pain, swollen, restricted joint counts, and disease duration.

Our study showed that 65% of the JIAPA-group patients and 50% of patients from the JAS group were severely disabled according to GFS III/IV. Thirty five percent of JIAPA-group patients had a HAQ-DI score of > 1.5 and 92% of JAS-group patients had a BASFI score > 5, these scores defined as severe functional impairment. These results disagree with those published during the last decade in JIA outcome studies (30-33). However, recently Ravelli and Martini have focused attention on that the current outcome of JIA is not satisfactory, because in reality the majority of children with JIA had continuing or recurrent disease activity that often extended into adulthood (34).

Our patients with JIAPA and JAS perceived poorer quality of life and poorer physical and emotional impairment compared with Mexican population scores (17) and with recently published international studies (7-9). Despite these findings, JIAPA and JAS cases did not refer mental health impairment compared with controls; this mental-domain scale is specifically related with nervousness and depression all of the time; therefore, patients are likely to have become accustomed to living with this disabling disease because such an illness begins in the early childhood years. EQ-5D corroborates impaired health status in this population studied. In this study, the JIAPA group possessed the severe functional disability and impaired physical and mental health similar to patients in the JAS group. Other factors probably contributing to an unfavorable outcome in this study include long disease duration (7, 32), late disease diagnosis, and lack of early DMARDs use (31).

Educational level is higher in patients with juvenile arthritis compared with the national group, but the percentage of unemployment in this study group

was 53% higher than in the national population (35), this explained by severe patient disability. Our findings are not in agreement with previous studies published 30 years ago in which Ansell and Wood (36) found that 83% of patients were studying, were employed, or were married and running a household at 15 years of follow-up, or more recently in which P.H. White and E.S. Shear in 1992 (37) reported an employment rate of 72% in patients with JIA. A fundamental aspect of long-term outcome studies should include standardized instruments to assess functional ability in children with JIA (39, 40) in order to increase the comparability of future studies on the prognosis of this chronic disease. We conclude that in our study population, JIAPA and JAS impair function and QOL severely with considerable difficulty for patient adaptation to adult life. This study calls for future studies in resource-poor countries for the identification of pediatric rheumatic diseases with great potential for causing disability.

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