Original Article

Assessment of the Quality of Life of Iraqi Children with Juvenile Idiopathic Arthritis: A Single-Center Study

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Abstract

Background: Even with the rapid advancement in the treatment of juvenile idiopathic arthritis (JIA), most affected children still suffer from remarkable degree of discomfort and reduced functional capacity. As such, many instruments have been invented to evaluate the quality of life (QoL) in those patients. **Objective:** This study aimed to assess the QoL in children with JIA using Children Health Assessment Questionnaire (CHAQ) instrument. **Materials and Methods:** This is a case–control study including 52 children with JIA who were attending Basrah Center for Disables Rehabilitation/Basrah, Iraq. Other age- and gender-matched children free from any systemic connective tissue diseases were also enrolled to represent the control group. One parent of each child (cases and control) was asked to read and fill an Arabic-translated version of the original CHAQ. Data were extracted from the questionnaire and subjected for statistical analysis. **Results:** Four types of JIA have been recognized which were oligoarthritis, polyarticular arthritis, systemic arthritis, and enthesitis-related arthritis which represented 48.08%, 36.54%, 9.62%, and 5.77%, respectively. Analysis of CHAQ data revealed a worse life quality in patients compared to controls. Six CHAQ domains (arising, walking, hygiene, activities, disability, and pain) attained significantly higher scores in patients (0.73 ± 0.61, 0.76 ± 0.52, 0.5 ± 0.29, 1.12 ± 0.6, 0.67 ± 0.41, and 0.83 ± 0.53, respectively) than in controls (0, 0, 0, 0.32 ± 0.26, 0.24 ± 0.21, and 0, respectively). **Conclusion:** CHAQ is a feasible and a reliable instrument to evaluate Iraqi children with arthritis. Treated children with JIA of different types had a worse QoL compared with the unaffected children.

Keywords: Arthritis, assessment, juvenile, quality of life

Introduction

Juvenile idiopathic arthritis (JIA) is a chronic immune-inflammatory disease with unknowing etiology starting before the age of 16 and lasting, at least, 6 weeks. The other known conditions that cause similar feature should be excluded before assigning the disease as JIA.[1] In high-income countries, incidence has been reported to vary from 2 to 20/100,000 population and prevalence from 16 to 150/100,000 population.[2] This disease usually associated swollen joints and stiffness, and thus it is considered as an important cause of short-term and long-term disability.[3]

Despite the tremendous improvement in the treatment of JIA during the last years, partly because of appropriate legislative initiatives in pediatric drug development,[4] a considerable number of affected children are still suffering from short-term and long-term disabilities as well as devastating complications such as chronic uveitis and end-stage renal failure.[5] These disabilities are not only restricted to physical impairments but also include social, mental, educational, and economic consequences.[6] Accordingly, a number of instruments have been developed to evaluate general health and life quality of the affected children. Two of these instruments have gained a global acceptance: Children Health Assessment Questionnaire (CHAQ) and Short Form Health Survey 36.

The CHAQ is a disease-specific, self-reported questionnaire which measures both the disability and discomfort in children with chronic arthritis in general.[7] This instrument has been frequently subjected for testing and found to be valid, reliable, and sensitive for development over time.[8,9] Thus, this study aimed to assess overall health and functional status of a

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sample of Iraqi children suffering from JIA using CHAQ instrument.

Materials and Methods

A total of 52 patients with JIA who were referred to Basrah Center for Disables Rehabilitation, Basrah, Iraq, for treatment during the period from January 2017 to August 2018 were enrolled in this case–control study. The diagnosis of JIA was made by the consultant medical staff at this center, and it was based on a clinical examination, X-ray findings, and laboratory tests in line with the criteria of International League of Associations for Rheumatology.[10] The classification of patients into different types was done according to Durban criteria.[11] Each JIA patient was investigated for erythrocyte sedimentation rate (ESR), double-strand antinuclear antibodies (dsANA), and C-reactive protein. Bone deformities were assessed by X-ray imaging.

Demographic and clinical data including age, gender, age at diagnosis, and disease duration were obtained either by direct interview with child's parent or from the hospital records. Other age-and sex-matched 50 children with no history of any systemic connective tissue diseases were randomly selected from those who hospitalized in the pediatric department of Al-Sadr Teaching Hospital, Basrah to represent the control group. Written informed consent explaining the scope of the study was obtained from at least one parent of all participating children.

Instruments

CHAQ reflects the functional capacity and independence during the last week of daily life activities. It is made up of eight domains: dressing, arising, eating, walking, reach, grip, hygiene, and activities. For each domain, there is a 4-level difficulty scale that is scored from 0 to 3, corresponding to "without any difficulty" (0), "with some difficulty" (1), "with much difficulty" (2), and "unable to do" (3). The higher scores correspond to the highest degree of incapacity. The average of the scores of the domains makes up the disability index, which varies from 0 to 3 points.

Utilization of assistance and/or aids in a domain sets the score to a minimum of 2 for that domain. CHAQ also presents visual analog scales (VAS) for pain evaluation. This was calculated using a metric ruler to measure the distance from the left hand side of the line to the mark (0–15.0 cm). The measured distance was multiplied by 2 to obtain a value from 0 to 3.0.

Statistical analysis

All statistical analysis was accomplished using Statistical Package for Social Sciences software version 24 (IBM SPSS Statistics for Windows, Armonk, NY, IBM Corp). Student's *t*-test was used to compare the scores of different CHAQ domains for the patients with those for the controls. The initial hypothesis was that the study population had more functional limitations than the healthy population. $P \leq 0.05$ was accepted as statistically significant.

Results

Demographic and clinical characteristic of the study population

Mean age of the patients was 12.9 ± 3.8 years compared to 11.8 ± 4.2 years for controls with no significant difference ($P = 0.407$). Likewise, there was no significant difference in gender distribution between the two groups [Table 1]. Among patients, there were 21 males and 31 females whereas there were 24 males and 26 females among controls ($P = 0.439$).

Oligoarthritis (OLI) and polyarticular arthritis (POL) represented the vast majority of JIA case with 25 (48.08%) and 19 (36.54%), respectively, while systemic arthritis (SA) and enthesitis-related arthritis (ERA) comprised the minority of cases with 5 (9.62%) and 3 (5.77%), respectively [Figure 1].

The clinical and laboratory characteristics of each type of JIA are shown in Table 2. Overall, there were no significant differences between the four types in all included clinical and laboratory findings. However, a remarkable higher proportion of dsANA positivity was seen among patients with OLI compared with the other types. In addition, patients with SA showed higher mean ESR compared with the other types (20 mm/h was accepted as a cutoff value of ESR).

Child Health Assessment Questionnaire in juvenile idiopathic arthritis patients and controls

Table 2 illustrates the result of eight CHAQ domains as well as disability index and VAS (pain score). Five of these ten domains showed significant differences between patients and controls. Interestingly, in four of these five domains, the control group reported perfect achievement with zero value for each of arising, walking, hygiene, and VAS. The fifth domain which differed significantly between patients and controls was the disability index (0.67 ± 0.41 vs. 0.24 ± 0.21) because this index represents the average values for the eight CHAQ domains.

The most affected domains by the disease were activities (1.12 ± 0.6) followed by walking (0.76 ± 0.52) and then arising (0.73 ± 0.61). On the other hand, the least affected domains were eating (0.43 ± 0.33) and grip (0.50 ± 0.37).

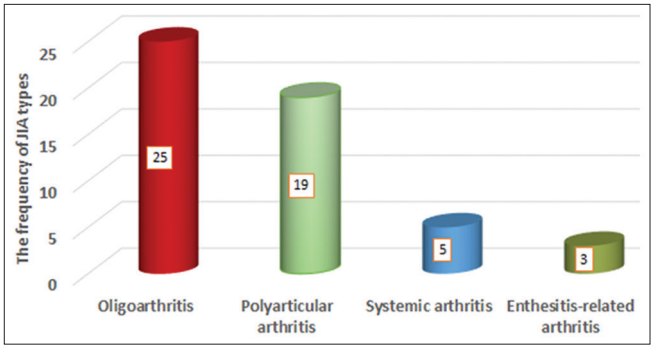

Figure 1: The frequency of different types of juvenile idiopathic arthritis

Table 1: Clinical and laboratory data of patients with different types of juvenile idiopathic arthritis

Variables	OLI (*n*=25), *n* (%)	POL (*n*=19), *n* (%)	SA (*n*=5), *n* (%)	ERA (*n*=3), *n* (%)	*P*
Age at diagnosis (years)	4.9±0.8	7.2±1.1	5.8±1.6	4.7±0.58	0.46
Disease duration (years)	4.2±1.3	3.7±0.9	4.0±1.0	4.3±0.58	0.62
dsANA					
Yes	11 (44)	4 (21.1)	1 (20)	0	0.06
No	14 (56)	15 (78.9)	4 (80)	3 (100)	
C-reactive protein					
Positive	4 (16)	1 (5.3)	0	0	0.49
Negative	21 (84)	18 (94.7)	5 (100)	3 (100)	
ESR (mm/h)	41.6±7.4	44.3±6.5	52.4±8.5	38.3±7.0	0.13
Uveitis					
Yes	3 (12)	1 (5.3)	0	0	0.69
No	22 (88)	18 (94.7)	5 (100)	3 (100)	

OLI: Oligoarthritis, POL: Polyarticular arthritis, SA: Systemic arthritis, ERA: Enthesitis-related arthritis, SD: Standard deviation, dsANA: Double-strand anti-nuclear antibodies, ESR: Erythrocyte sedimentation rate. Lower scores indicates better functional ability

Table 2: The eight domains of Children Health Assessment Questionnaire, disability index, and pain score in juvenile idiopathic arthritis patients and controls

Domains	Mean±SD		*P*
	Patients (*n*=52)	Controls (*n*=50)	
Dressing	0.64±0.42	0.33±0.23	0.121
Arising	0.73±0.61	0.0±0.0	<0.001
Eating	0.43±0.33	0.42±0.30	0.92
Walking	0.76±0.52	0.0±0.0	<0.001
Hygiene	0.50±0.29	0.0±0.0	<0.001
Reach	0.69±0.44	0.34±0.41	0.12
Grip	0.50±0.37	0.37±0.22	0.281
Activities	1.12±0.6	0.32±0.26	<0.001
Disability index	0.67±0.41	0.24±0.21	0.031
Visual analog scale (pain)	0.83±0.53	0.0±0.0	<0.001

SD: Standard deviation. Lower scores indicate better functional ability

Child Health Assessment Questionnaire in different types of juvenile idiopathic arthritis

Generally, three domains showed significant variation between the four types of JIA [Table 3]. The mean score for arising in OLI was 0.14 ± 0.05 which was much less than that in POL (0.94 ± 0.72), SA (1.0 ± 0.61), or ERA (0.82 ± 0.71) with significant difference (P = 0.02). Likewise, patients affected with OLI showed the least VAS (0.46 ± 0.27) than the other types. In this regard, patients with ERA had the highest VAS (1.32±0.76). On the other hand, SA patients seemed to have better walking activity (0.59 ± 0.40) than other types (P = 0.04).

Discussion

This study aimed to evaluate the quality of life (QoL) in children with JIA. Four types of JIA have been recognized in this study (OLI, POL, SA, and ERA) where the OLI represented about half of all cases. These results are comparable with a recent local study conducted in two centers in Baghdad and reported the same four types of JIA with the preponderance of OLI (either persistent or extended) over the other types.[12] However, the current results vary from that reported in Oman in which a total of 107 cases with JIA were investigated in a population-based multicenter study.[13] The authors reported five types of JIA (including psoriatic arthritis), and the POL rather than OLI was the most prevalent type. This variation may be attributed to ethnical factor and the different criteria used for JIA classification.

No significant differences were found between the different types of JIA regarding the clinical characteristics. In fact, the definitive diagnosis of JIA depends mainly on the clinical findings, and no laboratory investigation can confirm this diagnosis. Rather, these investigations can provide evidence of inflammation, monitor toxicity of therapy, and better understand the pathogenesis of the disease.[14] Interestingly, the adapted Durbin classification mainly depends on clinical evaluation and family history and has been frequently criticized because a considerable percent of JIA patients are unclassified.[15] Thus, it is not expected to find significant differences between JIA types in laboratory findings. Nevertheless, a previous Turkish study including 85 JIA patients and 60 healthy children reported higher ESR levels in SA and POL than OLI.[16]

For uveitis, this complication occurs in 10%–20% of all JIA cases. It most commonly occurs in young girls with dsANA-positive OLI (78%–90%) compared with 7%–15% of POL and rarely in SA.[17] However, may be due to the relative small sample size, the current result did not show a significant variation in the occurrence of this complication between different JIA types.

The most important result of the present study is that children with JIA have worse QoL than control group. These results confirmed the earlier studies conducted at different world regions.[18-20] Five domains of CHAQ were significantly higher in patients than controls in the current study. These were arising, walking, hygiene, activities, and VAS. In a Turkish study including 82 child with JIA using the same

Table 3: The eight domains of Children Health Assessment Questionnaire, disability index, and pain score in different types of juvenile idiopathic arthritis

CHAQ domains	Mean±SD				*P*
	OLI (*n*=25)	POL (*n*=19)	SA (*n*=5)	ERA (*n*=3)	
Dressing	0.62±0.41	0.72±0.39	0.51±0.33	0.69±0.41	0.26
Arising	0.14±0.05	0.94±0.72	1.0±0.61	0.82±0.0.71	0.02
Eating	0.47±0.32	0.51±0.52	0.32±0.30	0.44±0.34	0.17
Walking	0.84±0.51	0.83±0.61	0.59±0.40	0.77±0.39	0.04
Hygiene	0.39±0.25	0.51±0.34	0.64±0.42	0.46±0.32	0.36
Reach	0.62±0.47	0.75±0.56	0.70±0.38	0.67±0.42	0.64
Grip	0.41±0.32	0.66±0.44	0.62±0.30	0.33±0.29	0.16
Activities	1.12±0.71	1.39±1.10	1.06±0.46	0.91±0.62	0.07
Disability index	0.58±0.38	0.81±0.46	0.68±0.42	0.65±0.42	0.29
Visual analog scale (pain)	0.46±0.27	0.83±0.44	0.71±0.38	1.32±0.76	0.024

Lower scores indicate better functional ability. OLI: Oligoarthritis, POL: Polyarticular arthritis, SA: Systemic arthritis, ERA: Enthesitis-related arthritis, SD: Standard deviation, CHAQ: Children Health Assessment Questionnaire

questionnaire, Gumus *et al*.[19] stated that all the domains (except eating) were significantly higher in patients than controls. This variation may be attributed to the differences in treatment protocols adapted in each series. Patients in the present study were treated with methotrexate, Enbrel (etanercept), corticosteroids (oral methylprednisolone), or disease-modifying anti-rheumatic drugs, which included leflunomide, sulfasalazine, and azathioprine. The vast majority of these medications reduce pain and limit the inflammatory response. However, it seems that the severity of the disease is beyond the capacity of medications to completely relieve the symptoms.

It is worthy to mention that most participated parents were able to understand the Arabic translated version of CHAQ. However, certain domains particularly VAS, hygiene, and grip were frequently required more explanation, and it was found, in average, that each questionnaire needs about 18 min to complete which is longer than that recorded in the previous studies.[21] Of note, there is a CHAQ modified for Arabic children.[22] However, I prefer to use the original version for the questionnaire because the lifestyle of Iraqi children is closer to European style than Saudi style. In fact, this modified version was developed mainly due to the dressing of Arabic thobe and the Arabic style toilet. Both of these features are almost not applicable for Iraqi children.

Children with OLI type showed significantly better arising and VAS scores than other types, while those with SA showed better walking score than the other types. In the Turkish study, there were no significant variation between the different types.[19] This disparity may be attributed to the study population. In the Turkish study, there were 15 patients on remission without any treatment, while in the current study, all patients were receiving some kinds of treatment. Anyhow, it is reasonable to assume that OLI patients are less suffering from pain and arising difficulties while SA patients have better walking capacity compared with other types although larger sample size is required to confirm such a result.

Conclusion

Collectively, data from this study indicate that CHAQ is feasible and reliable to be used in Iraqi children. Treated children with JIA of different types had a worse QoL compared with the healthy children. A study comparing QoL of children with JIA under different treatment protocol is required to increase the general well-being of those children.

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Conflicts of interest

There are no conflicts of interest.

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