The Journal of Rheumatology 2021;xx:xxxx
doi:10.3899/jrheum.210011
First Release July 15 2021

The Journal of Rheumatology

Changes in Treatments and Outcomes After Implementation of a National Universal Access Program for Juvenile Idiopathic Arthritis

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ABSTRACT. ***Objective.*** To evaluate the clinical and demographic characteristics of patients with juvenile idiopathic arthritis (JIA) in Chile and compare treatments and outcomes before and after the introduction in 2010 of the Explicit Health Guarantees (GES) for JIA, a national universal access program for diagnosis and treatment of this condition.

Methods. The clinical records of 280 patients with JIA followed at a private tertiary academic health network between 2007 and 2018 were reviewed.

Results. Seventy percent of patients with JIA were female, mean age at diagnosis was 8.5 ± 4.8 years and mean follow-up was 4.0 ± 3.7 years. After GES implementation (post-GES), time to evaluation by pediatric rheumatologist and diagnostic delay were significantly reduced (15.0 ± 4.5 vs 9.0 ± 4.2 months, $P = 0.004$). In addition, use of magnetic resonance imaging significantly increased post-GES ($P < 0.001$). In terms of JIA treatments, before GES implementation, no patients received biologics. Of the 67 patients diagnosed before 2010 with continued follow-up at our center, 34% began biologic treatment after GES implementation. Of 196 patients diagnosed post-GES, 46% were treated with biologics. JIA remission rates were significantly higher in patients diagnosed post-GES compared to pre-GES (43% vs 29%, $P = 0.02$). Post-GES, we observed a significant decrease in uveitis complications among JIA patients (45% vs 13%, $P = 0.04$).

Conclusion. The implementation of a national government-mandated universal access program for guaranteed JIA diagnosis and treatment led to earlier access to a pediatric rheumatologist and JIA diagnosis, increased rates of treatment with biologic drugs, higher rates of clinical remission, and lower rates of uveitis complications in Chilean children with JIA.

Key Indexing Terms: biologics, delayed diagnosis, health policies, juvenile idiopathic arthritis, universal healthcare

Juvenile idiopathic arthritis (JIA) is a heterogeneous group of diseases characterized by arthritis of unknown origin that persists for more than 6 weeks, with onset before 16 years.[1] It is currently the most common childhood chronic rheumatic disease, with a prevalence estimated to be 1 in 1000 for White populations.[2] There are no data on JIA prevalence in Chile. In recent decades, there have been major advances worldwide in access to timely diagnosis, and the treatment armamentarium against JIA has grown considerably. Earlier introduction of disease-modifying antirheumatic drugs (DMARDs), more widespread use of intraarticular steroids (IAS), and biological agents targeting molecules involved in disease pathogenesis have significantly improved outcomes.[3] However, a large proportion of patients with JIA continue to have persistent disease activity 1 year after initial presentation,[4] and 40–60% continue to have active disease in adulthood.[5] It is likely that delayed diagnosis and treatment access barriers are responsible for the suboptimal clinical outcomes in many of these patients. In the developing world, these problems are largely increased due to the scarcity of pediatric rheumatology specialists and often prohibitive costs of medications, particularly biologics.

Socioeconomic costs of JIA are high. In Europe, the annual cost per pediatric patient in 2012 ranged from €18,913 to €45,227, corresponding to direct healthcare costs (drugs, medical visits, hospitalizations, tests, and transportation) and nonhealthcare costs (caregivers, social services, and nonhealthcare transportation).[6] In the UK, the annual cost per patient in 2012 was reported to be €31,546, with a striking 27% accounted for by early retirement.[7] In the US, the yearly calculated cost of JIA from 2008 to 2016 is US$18,611 per patient, increasing to US$39,218 in biologic users.[8]

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The authors declare no conflicts of interest.

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Accepted for publication April 20, 2021.

The Chilean healthcare system combines public and private insurance. Public insurance covers > 80% of the population, mainly from middle–low socioeconomic levels, whereas the remaining population is covered by private or armed forces insurance. The latter is government-funded but provides private healthcare for members of the armed forces and their families. In 2000, a new program called the Explicit Health Guarantees (Garantías Explícitas en Salud [GES]) was created in Chile with the objective of improving healthcare quality by legally mandating guaranteed universal diagnostic and therapeutic access for different high-burden health problems.[9] Illnesses included in the GES program were selected using a set of criteria that included disease burden, treatment effectiveness, capacity of the health system, financial burden, and social consensus.[10] JIA was incorporated into the GES program in 2010, providing national universal access to diagnosis and therapy for all patients with JIA for life, even after transition to adult medicine. The GES program guarantees that evaluation by a specialist must take place before 30 days after referral from primary care, and that treatment must start no later than 7 days after confirmation of diagnosis. In terms of out-of-pocket costs, the GES program is free for people with low socioeconomic status who have public insurance. For those with public insurance but middle socioeconomic status, GES covers 90% of costs; for the privately insured population, 80% of costs are covered by insurance, capping out-of-pocket expenditures at approximately US$20 per month for nonbiologic users and at approximately US$250 per month for those requiring biologics.[11]

The aims of this study were to evaluate the clinical and demographic characteristics of a cohort of JIA patients in Chile and to compare how treatments and outcomes have changed in this cohort after the introduction of the GES program for JIA in 2010.

METHODS

A retrospective review was performed of clinical records of patients aged < 18 years, evaluated for the diagnosis of JIA between 2007 and 2018, at 6 pediatric rheumatology outpatient clinics and hospitals of the UC Christus Health Network, a private tertiary academic health network based in Santiago, Chile. All children were evaluated by a trained pediatric rheumatologist. Data of clinical characteristics such as age at the time of diagnosis, sex, age of symptom onset, diagnostic delay, comorbidities, laboratory evaluations at diagnosis, all imaging studies, and all treatments used in the course of the disease were recorded. JIA diagnosis was determined by the treating physician and classified by the International League of Associations for Rheumatology criteria as oligoarthritis, rheumatoid-factor (RF)-positive polyarthritis, RF-negative polyarthritis, systemic arthritis, enthesitis-related arthritis (ERA), psoriatic arthritis, or undifferentiated arthritis.[12] Inactive disease was defined as a state of no joints with active arthritis, no uveitis, no systemic symptoms, normal erythrocyte sedimentation rate (ESR) and/or C-reactive protein (CRP), and a physician global assessment indicating no disease activity. Remission was defined as inactive disease for at least 6 consecutive months.[13] Uveitis remission was defined by the treating ophthalmologists, who in most cases were specialists in uveitis.

The GES program consists of 2 different medical benefits packages: 1 standard package for children requiring nonbiologic treatment, and another for patients requiring biologics. Both packages include pediatric rheumatology consultations as well as consultations with ancillary specialties (ophthalmology, orthopedics) and allied health professionals (physical therapy, occupational therapy). The standard package includes access to frequent laboratory tests including complete blood counts, antinuclear antibodies (ANA) by indirect immunofluorescence and RF by immunoturbidimetric method; radiological studies including radiographs, ultrasound (US), sacroiliac and temporomandibular joint magnetic resonance imaging (MRI), and bone density scan; and to nonbiologic drugs including nonsteroidal antiinflammatory drugs (NSAIDs), corticosteroids, methotrexate (MTX), sulfasalazine (SSZ), hydroxychloroquine (HCQ), and cyclosporine (CSA). The biologics package currently includes access to etanercept (ETN), adalimumab (ADA), infliximab (IFX), tocilizumab (TCZ), and abatacept (ABA), although the last 2 were incorporated to the package in 2016. A patient included in the JIA GES program can access its benefits even after he/she transitions to adult care. The package chosen for each patient is decided solely by the treating physician depending on whether the specialist considers that the patient needs biologic treatment or not. There is a national guideline constructed by Chilean specialists to guide this decision-making process.

To evaluate the impact of the GES program, the patients were divided into 2 subgroups: those diagnosed with JIA prior to the implementation of the GES program in 2010 (pre-GES group) and those diagnosed after 2010 (post-GES group). To evaluate the effect of GES on treatments received by pre-GES patients, for some analyses we further subdivided this group into those with and without follow-up at our center after GES implementation.

This study was approved by the Pontificia Universidad Católica de Chile Scientific Ethics Committee (protocol number 190905008, November 07, 2019).

Statistical analyses. Analyses were performed using IBM SPSS version 25.0 (IBM Corp.). The Mann-Whitney *U* test was applied to compare numerical variables between groups. The chi-square test was used to test relationships between categorical variables. Correlations between numerical variables were performed using Spearman rank correlation coefficient. All values are expressed as mean and SD unless stated otherwise. A 2-tailed P value < 0.05 was considered statistically significant.

RESULTS

Demographic data and clinical characteristics. From January 2007 to December 2018, 280 patients with JIA were followed at our institution and included in this study; 84 pre-GES patients and 196 post-GES were identified. Demographic and clinical characteristics of both groups are outlined in Table 1. Uveitis was diagnosed in 34 patients (12%); of these, 74% of them were female, with a median age of onset of 4.4 ± 3.6 years, and most of them had oligoarthritis (65%).

Regarding laboratory evaluations, ANA were positive in 46% of patients, and of these, 58% had oligoarthritis. HLA-B27 was positive in 21 (8%) patients, of which 17 (81%) had ERA, 2 had oligoarthritis, and 2 had RF-negative polyarthritis. At diagnosis, mean CRP was 4.2 ± 14 mg/dL, and ESR was 19 ± 27 mm/h. Interferon-γ release assay for tuberculosis (TB) screening was done in all 113 patients who had begun biologics, with 2 patients having positive QuantiFERON-TB tests and requiring anti-TB treatment before starting biologics.

Sixty-four percent of patients had imaging studies performed. The most frequently performed radiology studies were joint US in 30% of patients and MRI in 28% of patients. In 72%, imaging studies showed signs of arthritis, most commonly synovitis and joint effusion, whereas erosions were found in 22 patients.

A comparison of baseline clinical characteristics among the 2 groups showed no significant differences. Of note, there was a significant difference in time to pediatric rheumatology

Table 1. Clinical characteristics of patients with JIA diagnosed before and after implementation of the GES program.

	Total, n = 280	Pre-GES, n = 84	Post-GES, n = 196	*P*
Demographics				
Age at disease onset, yrs	7.7 ± 4.6	6.9 ± 4.5	8 ± 4.6	0.06
Age at diagnosis, yrs	8.5 ± 4.8	8.1 ± 4.5	8.75 ± 4.8	0.34
Diagnosis delay, months	10.4 ± 19	15.0 ± 4.5	9.0 ± 4.2	**0.004**
Female	195 (70)	63 (75)	132 (67)	0.26
Clinical features				
No. of active joints < 6 months	4.8 ± 6.2	4.5 ± 5.0	4.9 ± 6.4	0.63
No. of active joints ≥ 6 months	5.5 ± 6.2	5.2 ± 5.9	5.7 ± 6.4	0.61
Arthritis subtype				
Oligoarthritis	122 (44)	35 (42)	87 (44)	0.70
RF+ polyarthritis	15 (5)	5 (6)	10 (5)	0.78
RF– polyarthritis	39 (14)	11 (13)	28 (14)	0.85
ERA	51 (18)	18 (21)	34 (17)	0.50
PsA	24 (9)	6 (7)	18 (9)	0.65
Systemic	22 (8)	9 (11)	13 (7)	0.33
Undifferentiated	7 (3)	1 (1)	6 (3)	0.68
Abnormal inflammatory variables at diagnosis	122 (44)	39 (46)	83 (42)	0.60
Uveitis	34 (12)	11 (13)	23 (12)	0.84
Enthesitis	50 (18)	16 (19)	34 (17)	0.74
Imaging studies				
Performed in total	180 (64)	51 (61)	129 (66)	0.42
Radiographs	56 (20)	24 (29)	32 (16)	**0.02**
US	85 (30)	23 (27)	62 (32)	0.57
MRI	80 (28)	9 (11)	71 (36)	< **0.001**
Treatments				
IAS	70 (25)	16 (19)	54 (28)	0.17
Systemic steroids	123 (44)	31 (37)	95 (48)	0.09
Biologic treatment	113 (40)	23 (27)	90 (46)	**0.005**
Uveitis patients treated with biologics	28 (82)	9 (82)	19 (83)	0.999
Rehabilitation therapy	58 (21)	21 (25)	37 (19)	0.26
Outcomes				
Inactive arthritis	131 (47)	54 (64)	128 (65)	0.89
Arthritis remission	63 (23)	24 (29)	85 (43)	**0.02**
Joint erosions	22 (8)	6 (7)	16 (8)	0.999
Uveitis remission	29 (85)	10 (94)	19 (83)	0.999
Uveitis complications	8 (24)	5 (45)	3 (13)	**0.04**
Follow-up, yrs	4.0 ± 3.7	6.75 ± 4.4	2.7 ± 2.3	< **0.001**

Values are expressed as mean ± SD or n (%). Values in bold are statistically significant. ERA: enthesitis-related arthritis; GES: Explicit Health Guarantees; IAS: intraarticular steroids; JIA: juvenile idiopathic arthritis; MRI: magnetic resonance imaging; PsA: psoriatic arthritis; RF: rheumatoid factor, US: ultrasound.

evaluation and diagnostic delay: pre-GES patients were evaluated and diagnosed 15.0 ± 4.5 months after onset of symptoms, vs 9.0 ± 4.2 months in post-GES patients ($P < 0.004$; Table 1, Figure 1).

In terms of imaging studies, the 2 groups differed in the number of radiographs and MRIs performed (of any joint), with more radiographs done in pre-GES patients than post-GES ($P = 0.02$), and the opposite for MRIs ($P < 0.001$; Table 1).

JIA treatments. In the entire cohort, NSAIDs were used in 209 patients (75%), 202 (72%) were treated with MTX, 123 (44%) with systemic steroids, 70 (25%) with IAS, 39 patients (14%) received SSZ, and 17 patients (6%) HCQ. Few patients were treated at some point during follow-up with other drugs: CSA (n = 5), leflunomide (n = 5), tofacitinib (n = 1), and colchicine (n = 1). Biologics were given to 113 patients (40%): of these, 57 received ADA (50% of biologic users), 42 (37%) ETN, 19 (17%) TCZ, 6 (5.3%) IFX, 6 (5.3%) golimumab (GOL), 3 (2.6%) ABA, 3 (2.6%) rituximab (RTX), and 2 (1.7%) canakinumab.

Among the 34 patients with uveitis, 97% received MTX and 82% biologics, of whom 79% received ADA, 11% IFX, and 11% TCZ. Uveitis reactivation while on biologics was observed in 8 patients (29%): 7 with ADA and 1 with TCZ. Of those with reactivation during ADA, 2 increased doses, and 2 switched to TCZ, 1 to IFX, and 1 to ABA, and one was treated only with

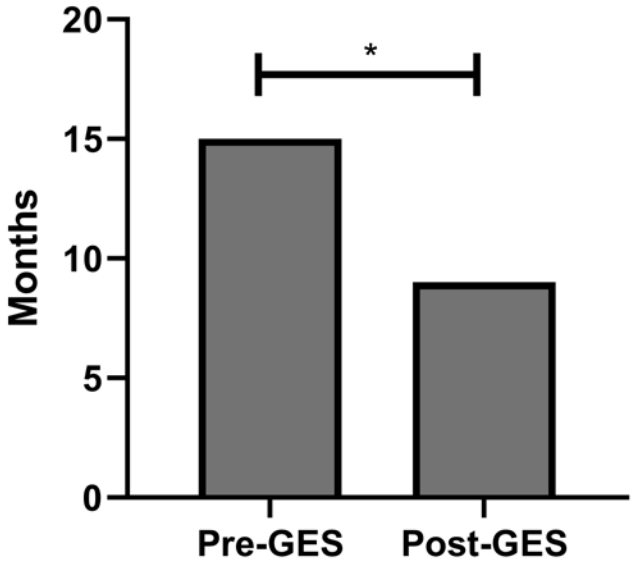

Figure 1. Juvenile idiopathic arthritis diagnostic delay before and after GES national program implementation in Chile. * $P < 0.05$. GES: Explicit Health Guarantees.

topical steroids. The patient who flared uveitis on TCZ was switched to ADA. At the last visit, 85% of patients had achieved uveitis remission. Uveitis was complicated by cataracts in 2 patients (6%), partial loss of vision in 5 patients (15%), and glaucoma in 6 patients (18%).

Fifty-eight patients (21%) were referred to allied health therapies: 53 (19%) to physical therapy and 22 (7.8%) to occupational therapy.

At the last visit, 46.7% of the 280 patients had inactive arthritis, and 22.5% were in remission with a mean follow-up of 4.0 ± 3.7 years.

Treatments before and after the introduction of the GES program. Of the 84 patients diagnosed before GES, 17 were not followed up in our center after 2010 (pre-GES without follow-up). Of these 17 patients, 82% received NSAIDs, 59% MTX, 36% systemic steroids, and 6% IAS. No patients in this group received biologics. Of the 67 patients diagnosed before GES and with subsequent follow-up in our center (pre-GES with follow-up), 72% received NSAIDs, 76% MTX, 35% systemic steroids, and 22% IAS. In this group, after GES implementation, 34% started biologics (23 patients), which were used in the following proportions: ETN (52%), ADA (39%), TCZ (17%), IFX (13%), ABA (4%), and RTX (4%). Regarding the 196 post-GES patients, 75% received NSAIDs, 72% MTX, 48% systemic steroids, 28% IAS, and 46% biologics. In terms of specific biologics, patients in this group received ADA (53%), ETN (33%), TCZ (17%), GOL (7%), IFX (3%), ABA (2%), RTX (2%), and canakinumab (2%; Figure 2).

There was a significant difference in the use of biologic treatment between pre-GES and post-GES patients; 23 (27%) patients diagnosed before the GES implementation received biologics, and 90 (46%) patients diagnosed after GES implementation used biologics ($P = 0.005$). There was no difference in the use of other drug therapies (Table 1).

Effect of GES on JIA outcomes. A higher rate of JIA remission was observed in patients diagnosed after the implementation of the GES program compared to those diagnosed prior to its implementation (43% vs 29%, $P = 0.02$; Figure 3). No difference in the rate of joint erosions was seen between pre- and post-GES patients (Table 1). In terms of uveitis, although there was no difference in uveitis remission between pre- and post-GES patients (94% vs 83%, $P = 0.99$), we observed a significant decrease in uveitis complications after GES implementation (45% vs 13%, $P = 0.04$; Table 1). Cataracts developed in 18% of patients of the pre-GES group and in 0% of the post-GES group ($P = 0.045$), partial loss of vision developed in 36% in the pre-GES group and in 4% of the post-GES group ($P = 0.013$), and glaucoma in 36% of the pre-GES patients and 9% of the post-GES patients ($P = 0.047$). No deaths occurred in either cohort during follow-up.

DISCUSSION

This study demonstrates how a national government-mandated universal access program for the diagnosis and treatment of patients with JIA in Chile led to earlier access to pediatric rheumatologists and diagnosis, increased rates of biologic therapy, higher clinical remission rates, and a decrease in uveitis complications.

Patients with JIA in Chile presented similar demographic and clinical characteristics to patients in other international series, closely resembling clinical characteristics of North American patients with JIA.[14] As reported, oligoarthritis was the most common JIA type. However, unlike most other series that report RF-negative polyarthritis as the second in prevalence,[15] in our cohort, ERA was the second most prevalent JIA type. Overall, we believe that the characteristics of our JIA patients make our results applicable to most settings worldwide.

Timely diagnosis and treatment of JIA is essential to

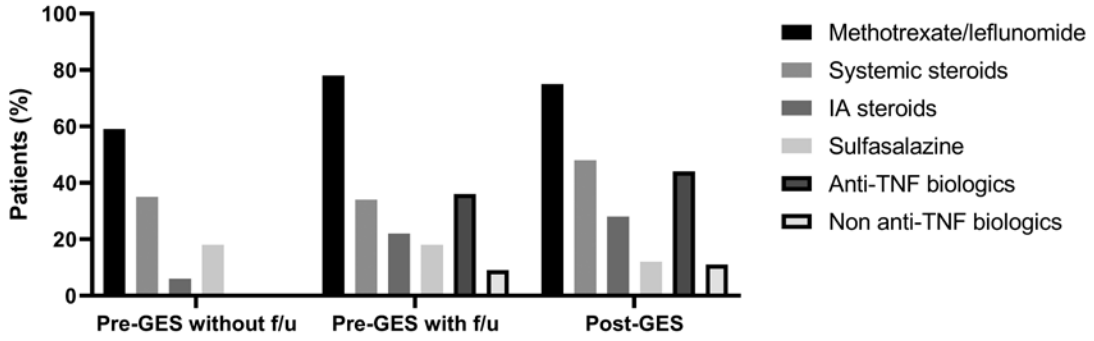

Figure 2. Changes in juvenile idiopathic arthritis treatment after GES national program implementation. Pre-GES without follow-up (f/u) patients are those diagnosed before GES introduction but without f/u in our center (n = 17); pre-GES with f/u are patients diagnosed before GES and with follow-up in our center after GES implementation (n = 67); and post-GES are those patients diagnosed after GES introduction (n = 196). IA: intraarticular; f/u: follow-up; GES: Explicit Health Guarantees; TNF: tumor necrosis factor.

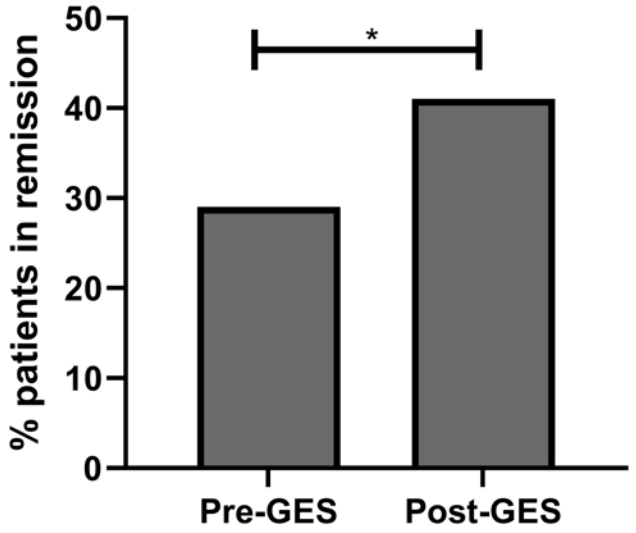

Figure 3. Juvenile idiopathic arthritis remission rate before and after GES program implementation in Chile. GES: Explicit Health Guarantees.

achieving optimal patient outcomes.[16] Multiple factors can influence the time it takes for a patient to be diagnosed. Diagnostic delay appears to vary by geographical location, probably due to healthcare access disparities.[14] Factors that appear to decrease diagnostic delay include arthritis subtype (shorter delay for systemic JIA),[17] younger age at onset,[18] aggressive clinical presentation, and abnormal inflammatory variables.[19] JIA characteristics in our series were comparable between pre- and post-GES groups, but notably, delay to pediatric rheumatology evaluation and JIA diagnosis decreased by 6 months on average after GES implementation. We attribute this improvement mainly to the government-mandated guarantee that evaluation by a specialist must take place no more than 30 days after referral from primary care. Although this reflects great advances, mean time to diagnosis in this series remains longer than that observed in series from developed countries,[18,19,20,21,22,23] suggesting additional measures must be adopted to improve access to early diagnosis.

Imaging studies play an important role in the diagnosis and monitoring of patients with JIA. The European League against Rheumatism (European Alliance of Associations for Rheumatology) and European Society of Pediatric Rheumatology recommend US and MRI in JIA evaluation to detect inflammation more accurately, determine joints involved, and to detect joint and bone damage early.[20] The GES program has guaranteed access to US and MRI for diagnosis and follow-up of JIA patients since 2010. We clearly demonstrate how after GES implementation, there was a significant increase in the number of MRIs performed ($P < 0.001$), probably facilitating earlier and more accurate diagnosis. We did not demonstrate a difference in the rate of joint erosions between pre-GES patients (with follow-up) and post-GES patients, although this was not evaluated systematically.

Since our series includes patients with JIA followed from several years before GES implementation, we were able to analyze how treatments and outcomes of this disease have changed longitudinally. Before the implementation of GES for JIA, patients had limited or no access to biologics due to high costs, even though the use of ETN for polyarticular JIA was approved by the Food and Drug Administration in 1999 and was available in Chile a few years later. Prior to GES, most of our patients received NSAIDs and MTX, with few oligoarthritis patients receiving IAS. After GES implementation, and largely due to this program, use of biologics increased from 0% to 27% among patients diagnosed before 2010, and reached 46% in patients diagnosed after 2010 ($P < 0.001$), constituting an outstanding achievement of this public policy.

Our current rate of biologic use is similar to Northern Europe and higher than other Latin American series that reported use of biologics in 32% of patients.[14] Disparities in access to biologics persist to date, even in developed countries with advanced welfare states.[23,24,25] Given that the Chilean per capita income is much lower than in Northern Europe,[21] the introduction of a program that legally guarantees universal access to these high-cost treatments may explain our current comparable rates. Given the government-mandated drug access, the rate of biologic use

in Chilean patients with JIA is likely to further increase in the future, considering that in the United States, up to 65% of JIA patients have used biologics, as reported by more recent series.[22] There are still several biologics that are not available in Chile, such as anakinra; others such as canakinumab are very expensive and not included in GES yet, so there is still a big gap to overcome.

Uveitis is the most frequent coexisting autoimmune disease in JIA patients and frequently requires biologic DMARDs (bDMARDs) for treatment.[26] Twelve percent of our patients presented uveitis, similar to the prevalence observed in Europe and higher than other series from Latin America, Africa, the Middle East, and Southeast Asia.[15] Early diagnosis and treatment is crucial for preventing complications.[27] The GES program guaranteed ophthalmology consultations for all children with JIA and gives access to biologic treatment as suggested by international guidelines.[1] Most of our uveitis patients were treated with biologics at some point, although all post-GES, with a remission rate of 83%. Thus, as previously reported, having access to biologic treatments is essential to uveitis outcomes.[28] We demonstrated how the GES program significantly decreased uveitis complications, including a striking decrease in partial vision loss from 36% to 4%, highlighting the impact of GES and universal access to biologics in the subgroup of JIA patients complicated by uveitis. Our study did not show a significant effect of GES on uveitis remission rates, probably due to the relatively low number of patients and the fact that all pre-GES patients with uveitis who required bDMARDs eventually received this therapy after 2010.

We observed no group difference in access to rehabilitation therapy because in Chile, the majority of patients who need rehabilitation attend centers of the Teletón foundation, a nonprofit organization created in 1979 that freely provides rehabilitation of children and adults with disabilities. Therefore, JIA patients pre- and post-GES have had access to rehabilitation regardless of their income or treatment guarantees.

JIA remission is a fundamental aspect of long-term outcome studies and the primary goal of treatment. Comparison of remission rates is difficult because remission criteria have changed over time, and different definitions are often used.[29] Using Wallace criteria, a systematic review of 17 studies, reported remission increased with longer disease duration from 33% at 6 months to 67% at 8 years.[30] Applying Wallace criteria,[13] our JIA remission rates were significantly higher in patients diagnosed post-GES compared to those diagnosed pre-GES (43% vs 29%, $P < 0.05$), despite the fact that almost one-third of pre-GES patients eventually received biologics after 2010 and that post-GES patients had shorter follow-up. Therefore, we strongly believe that earlier diagnosis is essential to achieve improved outcomes, although certainly this must be accompanied by early access to treatment. In Chile, additional pediatric rheumatologists are greatly needed throughout the country; we believe this is extremely important for early JIA diagnosis and treatment.

To our knowledge, our study is the first to evaluate the impact of implementing a universal healthcare access program for JIA, demonstrating a significant effect on JIA outcomes. Some limitations of this study must be considered. Although the introduction of GES appears to have greatly contributed to improving the prognosis of JIA in Chile, we cannot rule out the effect of the country's recent socioeconomic development, as it has been described that socioeconomic development is associated with lower JIA disease activity and damage.[14] An additional limitation of our study is that it did not include public hospitals. These institutions likely have additional and greater difficulties in access to diagnosis and therapy due to hidden access barriers, such as geographic distance and cost of transportation to a pediatric rheumatologist. However, given that the benefits packages of GES are universal for Chilean patients regardless of institution and insurance, we believe our results probably can be extrapolated to reflect improvement in diagnosis, treatment access, and outcomes in other centers throughout the country. Another limitation is that given the retrospective nature of our study, the classification of JIA types may have imprecisions, although we believe the diagnostic criteria were well registered in patient records. Similarly, no systematic prospective collection of adverse events was done, which limited our capacity to perform a comparative analysis of adverse events pre- and post-GES due to important risk of ascertainment and information bias.

In conclusion, these results show that the JIA GES program turned out to be a successful public policy in Chile, achieving earlier diagnosis, giving universal access to treatments including biologics, and improving the outcomes and prognosis of children with JIA. Given the rapidly evolving therapeutic armamentarium of JIA worldwide, it is important that the GES program undergoes constant reevaluation to add novel therapies that have demonstrated efficacy in JIA. This program sets an example for a successful public policy that could be implemented in other developing and developed countries worldwide.

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