The Patterns of Juvenile Idiopathic Arthritis

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Background: Juvenile idiopathic arthritis (JIA) is one of the most common chronic rheumatological diseases seen in children below 16 years of age.

Objective: To evaluate JIA and its, clinical and laboratory characteristics and treatment.

Design: A Retrospective Study.

Setting: Department of Pediatrics, Abha Maternity and Children Hospital, Saudi Arabia.

Method: All children who presented with symptoms of arthritis and diagnosed with JIA between 1 June 2014 and 30 June 2018 were included in the study.

Result: Seventy-four children suffering from JIA were included in the study. Thirty (40.4%) children had oligoarthritis, followed by 22 (29.7%) children with polyarthritis RF positive and 2 (2.7%) with RF negative. Twelve (16.2%) were undifferentiated Juvenile Rheumatoid Arthritis (JRA). Sixty-four (86.5%) had joint pain, followed by joint swelling in 28 (37.8%). Twenty-five (33.8%) had a fever, 18 (24.3%) had rashes, Fifteen (20.3%) had a joint disability, 12 (16.2%) had fatigue, and nine (12.2%) had sleep disturbance. The laboratory profile was normal among most of the children and the frequency of ANA was positive among 29 (39.2%) children. Pharmacologic therapy started with NSAIDs followed by DMARDs.

Conclusion: The most common type of JIA was oligoarthritis. The treatment with biological agents and pharmacological medications are important for managing the complications of JIA among children.

JIA is a chronic inflammatory arthritis seen in children below 16 years of age. It is the most common chronic rheumatologic disease in children and is associated with joint swelling, increased heat sensation, tenderness and pain or limitation of movement for at least 6 weeks[1,2].

According to the International League of Associations for Rheumatology (ILAR), JIA is classified into seven types. The classification system is to recognize clinically homogenous subtypes of JIA which facilitate therapy identification and outcome management[3].

Though JIA is a common rheumatic disorder in the western world, its prevalence differs according to genetic factors and ethnicity[4]. The actual prevalence among Arab children still needs further research.

The diagnosis of JIA does not depend on laboratory investigations, but it can be achieved by exclusion[5]. There is no cure for JIA, thus the management aims to control the symptoms and prevent further complications.

There is a lack of published studies defining the characteristics of JIA in Saudi Arabia and other Arab countries; however, some studies were identified about JIA[6-10].

The aim of this study is to evaluate JIA, clinical, laboratory characteristics and treatment.

METHOD

All children diagnosed with JIA from 1 June 2014 to 30 June 2018 were included in the study. The minimum sample size was calculated according to Swinscow and Cohen formula (2003). All children born in Aseer and presented with juvenile chronic arthritis and diagnosed with persistent and extended JIA were included in the study.

The data of the patients were documented from the daycare unit and a questionnaire was developed after reviewing the literature including the study of Al-Hemairi et al[7].

Statistical analysis was done using SPSS software version 18.0. Descriptive analysis was done and statistics were presented as numbers and percentages for the categorical data and mean and standard deviation (SD) for continuous data.

RESULT

Seventy-four children suffering from JIA were included in the study. The data was collected, analyzed and tabulated.

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The mean maternal age was 35.87 years ranging from 23 to 55 years. Thirty-two (43.2%) mothers were between 30 to 40 years. The mean child age was 7.77 years, ranging from 1 to 18 years. Thirty-five (47.3%) children were males and 39 (52.7%) were females; the male to female ratio was 1:1.1, see table 1.

Table 1: Personal Characteristics of Maternal and Child

	Number	Percentage
Maternal age		
<30	18	24.3%
30-40	32	43.2%
>40	24	32.5%
Total	74	100%
Range	23.0 – 55.0	
Mean	35.87	
S.D.	7.15	
Child age		
<6	27	36.5%
6-10	20	27%
>10	27	35.5%
Total	74	100%
Range	1.0 – 18.0	
Mean	7.77	
S.D.	3.28	
Child sex		
Male	35	47.3%
Female	39	52.7%
Total	74	100%

All the children were born in the Kingdom of Saudi Arabia (KSA), except for one child who was born in India. The majority of the parents had university or higher education. More than 70.0% of the study group did not mention the income, see table 2.

Thirty (40.5%) children had oligoarthritic JIA, followed by 22 (29.7%) children with polyarthritis RF positive and 2 (2.7%) with RF negative. Twelve (16.2%) were undifferentiated Juvenile Rheumatoid Arthritis (JRA), see table 3.

Thirty-eight (51.4%) children were between six to 10 years, followed by 22 (29.7%) below 6 years of age and 14 (18.9%) above 10 years of age. Sixty-four (86.5%) children had joint pain, followed by 28 (37.8%) with joint swelling. Twenty-five (33.8%) had fever and 18 (24.3%) had rashes. Fifteen (20.3%) children had joint disability. Twelve (16.2%) suffered from fatigue and nine (12.2%) suffered sleep disturbance.

ANA test was positive in 29 (39.2%) children. Ds-DNA was positive in 27 (36.5%) children; RF was positive in 18 (24.3%) patients, ANCA was positive in 9 (12.2%), ALP was elevated in 5 (6.8%), AST and ALT were elevated in 8 (10.8%), see table 4.

Table 2: Social Characteristics

	Number	Percentage
Which area do you live in?		
Abha	25	33.8%
Mahail	12	16.2%
Khamis Mashit	7	9.5%
Gazan	9	12.2%
Sorataboida	5	6.8%
Enamas	3	4.1%
Other	13	17.6%
Total	74	100%
In which country was your child born?		
KSA	73	98.6%
India	1	1.4%
Total	74	100%
What is the highest level of completed education for the father?		
1. Lower primary	11	14.9%
2. Upper primary	7	9.5%
3. Lower secondary	7	9.5%
4. Upper secondary	23	31.1%
5. University or higher	26	35.1%
Total	74	100%
What is the highest level of completed education for the mother?		
1. Lower primary	8	10.8%
2. Upper primary	8	10.8%
3. Lower secondary	11	14.9%
4. Upper secondary	23	31.1%
5. University or higher	24	32.4%
Total	74	100%
The income of your family is:		
1000-<3000	9	12.16%
3000-<8000	6	8.11%
8000+	7	9.46%
Not mention	52	70.27%
Total	**74**	100%

RBCs were decreased in 14 (18.9%) patients, WBCs were elevated in 4 (5.4%), the platelet count was decreased in 12 (16.2%), hemoglobin level was decreased (anemic) in 14 (18.9%), ESR was elevated in 53 (71.6%) patients, CRP was elevated in 20 (27.0%), blood glucose was elevated in 9 (12.2%), see table 5. The kidney function test was normal in all cases.

Thirty-four (45.9%) children were treated with Naproxen, followed by Diclofenac in 26 (35.1%) while 6 (8.1%) were treated with paracetamol and 8 (10.8%) with ibuprofen. Twenty-one (28.4%) used biologic agents; 17 (22.9%) used adalimumab. Sixty-two (83.8%) patients used DMARDs, all of them used methotrexate. The steroid was used by 46 (62.2%) patients, 25 (33.8%) used it as a tablet, while 21 (28.4%) patients used as injectable, see table 6.

It was found that there was no significance between the different type of JIA and the child sex, the distribution of the type of JIA was matched in the two sex (p <0.05), see table 7.

Table 3: JIA, Time of Onset and Symptoms

	Number	Percentage
Which type of JIA affected the child?		
Oligoarthritic	30	40.5%
Polyarthritis (rheumatoid factor +ve)	22	29.7%
Polyarthritis (rheumatoid factor –ve)	2	2.7%
Systemic onset	6	8.1%
Psoriatic arthritis	1	1.4%
Enthesitis related arthritis	1	1.4%
Undifferentiated JRA	12	16.2%
Total	**74**	100%
At which age was the child diagnosed with JIA?		
<6	22	29.7%
6-10	38	51.4%
10+	14	18.9%
Total	**74**	100%
The most common symptoms of JIA:		
Joint pain	64	86.5%
Swelling	28	37.8%
Joint stiffness	13	17.6%
Joint disability	15	20.3%
Sleep disturbance	9	12.2%
Weight loss and decrease appetite	6	8.1%
Fever	25	33.8%
Rash	18	24.3%
Decreased physical activity	10	13.5%
Fatigue	12	16.2%
Lymphadenopathy	2	2.7%

Table 4: Laboratory Findings

Result and analysis:	Number	Percentage
• Autoantibodies:		
ANA		
Positive	29	39.2%
Negative	45	60.8%
Ds-DNA		
Positive	27	36.5%
Negative	47	63.5%
RF		
Positive	18	24.3%
Negative	56	75.7%
Anti-CCP		
Positive	65	87.8%
Negative	9	12.2%
ANCA		
Positive	9	12.2%
Negative	65	87.8%
Liver function test		
ALP		
Normal	69	93.2%
Elevated	5	6.8%
AST		
Normal	66	89.2%
Elevated	8	10.8%
ALT		
Normal	66	89.2%
Elevated	8	10.8%

The children in different types of JIA had the same age distribution; there was no significant difference between the different types of JIA and the age of the patients, see table 8.

Table 5: Blood and Laboratory Findings

	Number	Percentage
• Complete blood count (CBC):		
RBCs		
Normal	60	81.1%
Decreased	14	18.9%
WBCs		
Normal	70	94.6%
Elevated	4	5.4%
PL		
Normal	62	83.8%
Decreased	12	16.2%
Hgb		
Normal	60	81.1%
Anemic	14	18.9%
ESR		
Normal	21	28.4%
Elevated	53	71.6%
• Other.		
CRP		
Normal	44	59.5%
Elevated	20	27.0%
Blood glucose		
Normal	65	87.8%
Elevated	9	12.2%
Cr		
Normal	74	100.0%
Elevated	0	0.0
Urea		
Normal	74	100.0%
Elevated	0	0.0

Table 6: Type of Treatment

		Number	Percentage
Treatments:			
Analgesia and NSAIDS:			
1.	Paracetamol	6	8.1%
2.	Ibuprofen	8	10.8%
3.	Naproxen	34	45.9%
4.	Diclofenac	26	35.1%
Biologic agents:			
1.	Abatacept	1	1.4%
2.	Adalimumab	17	23.0%
3.	Anakinra	3	4.1%
4.	Etanercept	0	0.0
5.	Etanercept-szzs	0	0.0
6.	Infliximab	0	0.0
7.	Not applicable	53	71.6%
DMARDs:			
1.	Hydroxychloroquine	0	00
2.	Methotrexate	62	83.8%
3.	Not applicable	12	16.2%
Steroid :			
1.	Tablets	25	33.8%
2.	Injectable	21	28.4%
3.	Not applicable	28	37.8%

It was found that there was no significant relationship between type of JIA and all types of treatment, see tables 9, 10, 11 and 12.

Table 7: Gender and Type of JIA

			Group				Total
		Oligoarthritic	Polyarthritis	Systemic onset	Arthritis	undifferentiated JIA	
Sex boy	No.	17	10	3	2	3	35
	%	56.7%	41.7%	50.0%	100.0%	25.0%	47.3%
girl	No.	13	15	3	0	9	39
	%	43.3%	58.4%	50.0%	0.0%	75.0%	52.8%
Total	No.	30	24	6	2	12	74
%		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
X²				7.99			
P				0.434			

Table 8: Age of Patients and Type of JIA

	N	Mean	S.D.	Min.	Max.
Oligoarthritic	30	7.97	3.01	3.00	12.00
Polyarthritis	24	8.33	3.68	4.00	18.00
Systemic onset	6	5.83	4.49	1.00	11.00
Arthritis	2	7.50	3.54	5.00	10.00
	12	7.21	2.41	3.50	11.00
Total	**74**	**7.78**	**3.28**	**1.00**	**18.00**
F		0.808			
P		0.524			

Table 9: Type of JIA and Analgesia/NSAIDS

Analgesia/ NSAIDS:			Group				Total
		Oligoarthritic	Polyarthritis	Systemic onset	Arthritis	undifferentiated JRA	
Paracetamol	No.	2	1	1	0	2	6
	%	6.7%	4.2%	16.7%	0.0%	16.7%	8.1%
Ibuprofen	No.	5	3	0	0	0	8
	%	16.7%	12.5%	0.0%	0.0%	0.0%	10.8%
Naproxen	No.	14	13	2	0	5	34
	%	46.7%	54.2%	33.3%	0.0%	41.7%	45.9%
Diclofenac	No.	9	7	3	2	5	26
	%	30.0%	29.2%	50.0%	100.0%	41.7%	35.1%
Total	No.	30	24	6	2	12	74
%		100.0%	100.0%	100.0%	100.0%	100.0%	
X²				20.7			
p				0.188			

Table 10: Type of JIA and Biologic Agents

Biologic agents:			Group				Total
		Oligoarthritic	Polyarthritis	Systemic onset	Arthritis	undifferentiated JRA	
Not applicable	No.	23	16	4	1	9	53
	%	76.7%	66.7%	66.7%	50.0%	75.0%	71.6%
Abatacept	No.	0	1	0	0	0	1
	%	0.0%	4.2%	0.0%	0.0%	0.0%	1.4%
Adalimumab	No.	7	4	2	1	3	17
	%	23.3%	16.7%	33.3%	50.0%	25.0%	23.0%
Anakinra	No.	0	3	0	0	0	3
	%	0.0%	12.5%	0.0%	0.0%	0.0%	4.1%
Total	No.	30	24	6	2	12	74
%		100.0%	100.0%	100.0%	100.0%	100.0%	
X²				10.04			
p				0.612			

Table 11: Type of JIA and DMARDs

DMARDs			Group				Total
		Oligoarthritic	Polyarthritis	Systemic onset	Arthritis	undifferentiated JRA	
Not applicable	No.	8	1	0	0	3	12
	%	26.7%	4.2%	0.0%	0.0%	25.0%	16.2%
Methotrexate	No.	22	23	6	2	9	62
	%	73.3%	95.8%	100.0%	100.0%	75.0%	83.8%
Total	No.	30	24	6	2	12	74
%		100.0%	100.0%	100.0%	100.0%	100.0%	
X²				8.994			
p				.061			

Table 12: Type of JIA and Steroid

Steroid :			Group				Total
		Oligoarthritic	Polyarthritis	Systemic onset	Arthritis	undifferentiated JRA	
Not applicable	No.	15	6	3	0	4	28
	%	50.0%	25.0%	50.0%	0.0%	33.3%	37.8%
Tablets	No.	7	10	2	1	5	25
	%	23.3%	41.7%	33.3%	50.0%	41.7%	33.8%
Injectable	No.	8	8	1	1	3	21
	%	26.7%	33.3%	16.7%	50.0%	25.0%	28.4%
Total	No.	30	24	6	2	12	74
%		100.0%	100.0%	100.0%	100.0%	100.0%	
X²				6.774			
p				0.561			

DISCUSSION

There is a lack of hospital-based studies about JIA pattern among Saudi children, only 3 studies described the distribution of types of JIA according to the ILAR classification system[7,8,11].

The distribution and prevalence of JIA subtypes are globally different due to different ethnic groups[12]. In this study, it was found that oligoarthritic was the main type of JIA, followed by polyarthritis and this was in the same pattern in other studies in the USA, South America, Europe, Turkey, and Canada[13-15]. However, various studies have reported varying results. Oman and Kuwait showed that the most common type was polyarthritis which is the same as the second most common type in the present study[15,16]. A recent Saudi study showed that the systemic onset of JIA was the most common subtype among children[7]. Another study showed that systemic-onset JIA was the most common subtype among children[15-17].

In this study, the most commonly affected children were between 6 and 10 years followed by less than 6 years and the rest were above 10 years. This age was probably close to the age of onset of JIA symptoms among children in many studies[18-20].

Diagnosis of JIA is usually done by exclusion and hence the clinical presentation plays an important role in diagnosing JIA. Although the presentation of these patients may vary, joint involvement in the form of arthralgia, swelling and disability was a common feature. Fever associated with fatigue and sleep disturbances were other common presenting symptoms. The JIA characteristic features in our study were similar to other studies[21-23].

The laboratory profile was normal among most of the children. However, anemia was found to be the most common laboratory

finding among children with JIA[24]. ANA was positive among 39.2% of subjects which was almost similar to other studies of 36.58%[6,18].

The management of JIA is based on controlling the symptoms, preventing damage of nerve and preserving joints from disability. Pharmacologic therapy of JIA revealed great advance since the introduction of biologic agents, starting with NSAIDs followed by DMARDs[25,26]

There was no correlation between the subtypes of JIA with age, gender or type of treatment.

CONCLUSION

The most common type of JIA was oligoarthritis. The treatment with biological agents and pharmacological medications are important for managing the complications of JIA among children.

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