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Clinical Spectrum of Juvenile Idiopathic Arthritis in Children in Tertiary Care Hospital

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ABSTRACT

Background: Juvenile idiopathic arthritis (JIA) an autoimmune illness affects infants and teenagers worldwide. The study aimed to find the clinical, laboratory, therapeutic, and demographic characteristics associated with JIA patients in a tertiary care hospital.

Methods: This retrospective cross-sectional study examined the clinical spectrum of JIA in children at Khyber Teaching Hospital, Peshawar from February 25 to August 25, 2023. A total of 106 patients of both genders of less than 16 years of age, who fulfilled the International League of Association for Rheumatology (ILAR) criteria for JIA, were enrolled through the convenience sampling technique in this study. Diagnostic assessments, including clinical evaluations, laboratory testing, and imaging examinations were documented. Data analysis performed by SPSS 16.

Results: Out of the total patients (n=102), 61.8% were male with mean age at presentation being 9.44±3.89 years (2-7 years) and median duration of disease being 24 months (interquartile range 42 months). The majority (n=55, 53.9%) fall in the 11-15 age group, with Polyarticular RF Negative JIA prevailing 45 (44.1%, p<0.001%). Enthesial pain is frequent (n=84, 82.4%), while fever (n=47, 46.1% p=0.176) and lower back pain (n=35, 34.3%) were noted. Rashes were infrequent (n=10, 9.8%), and most reported symptoms for over 36 months (n=55, 53.9%). Treatment involves predominantly methotrexate (n=77, 75.5%). Gender and subtype disparities emphasize the intricate heterogeneity in symptom manifestation (p<0.05).

Conclusion: : The study findings have shown that the JIA is significantly associated with clinical, laboratory, and demographic factors and suggests crafting a policy for on-time diagnosis and management of JIA.

Keywords: Autoimmune Diseases, Juvenile Arthritis, Rheumatoid Factor.

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INTRODUCTION

Juvenile Idiopathic Arthritis (JIA) is the prevailing rheumatic condition that impacts children globally. This chronic autoimmune ailment includes a wide range of disorders that are characterized by ongoing inflammation in the joints, which starts before the age of 16 [1]. The prevalence of JIA varies throughout communities; however, it is believed that about 1 in 1,000 children are impacted by this condition [2, 3]. Globally, approximately 3 million children and young adults are estimated to suffer from JIA. The global prevalence of JIA has been estimated to range from 3.8 to 400/100,000 with an incidence of 1.6 to 23/100,000 [3]. Girls were consistently found to be at a higher risk than boys, and the oligoarticular subtype was found to be predominant [4].

The diverse characteristics of JIA are emphasized by its categorization into many subgroups, such as oligoarthritis, polyarthritis, systemic arthritis, enthesitis-related arthritis, psoriatic arthritis, and undifferentiated arthritis. Every subtype has unique clinical characteristics, illness progressions, and prognostic outcomes [5, 6]. Geographical and ethnic factors also contribute to the study of JIA, with variances shown in the rates of occurrence and the most common subtypes across different ethnicities. The complex character of JIA highlights the need for ongoing study to clarify its fundamental causes and enhance diagnostic and treatment methods, eventually improving the well-being of afflicted children [7, 8].

JIA is acknowledged as a substantial health concern among children in Pakistan, as well as in several other nations. Global estimations indicate that JIA has a prevalence of roughly 1 in 1,000 youngsters globally. The prevalence of the illness in Pakistan is anticipated to correspond to worldwide statistics. However, variances in different regions and hereditary variables can lead to disparities in the burden of the disease [9]. Ongoing endeavors to estimate the incidence of JIA in Pakistan are of utmost importance since epidemiological research is essential for comprehending the precise statistics and trends. Accurate data on the prevalence, subtypes, and demography of JIA is collected via comprehensive national health surveys and pediatric rheumatology registries [9].

The diagnostic criteria, as initially established by the International League of Associations for Rheumatology (ILAR), consider the length of arthritis, the number of afflicted joints, and distinct clinical characteristics. Diagnosis requires the elimination of other causes of infantile arthritis. Clinical examinations include the examination of joints, the measurement of morning stiffness, and the assessment of associated symptoms. Diagnostic procedures, such as erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) testing, in addition to imaging techniques like X-rays and ultrasound, assist in assessing joint deterioration [10,11]. JIA consists of several subgroups, each exhibiting distinct clinical features, including oligoarthritis, polyarthritis, systemic arthritis, enthesitis-related arthritis, and psoriatic arthritis [8].

Gaining a comprehensive understanding of these subtypes is crucial for developing customized treatment regimens. The research is necessary due to the lack of information on the clinical spectrum of JIA, particularly in tertiary care settings. The research intends to address unique problems and possibilities in these situations by giving an updated analysis. This will contribute to the diagnostic refinement and the development of specialized treatment methods. The objective of this interdisciplinary method was to analyze the results in the framework of comprehensive and collaborative healthcare, hence augmenting the study's total comprehensiveness and significance. This research aimed to find the clinical, laboratory, therapeutic, and demographic characteristics associated with JIA patients in a tertiary care hospital to find out the features of the disease's variability.

METHODS

This study used a retrospective cross-sectional design to thoroughly investigate the clinical range of JIA in the pediatric population at Khyber Teaching Hospital, Peshawar. The research included pediatric patients diagnosed with JIA who received medical treatment at Khyber Teaching Hospital throughout the period from 25th February to 25th August 2023. A total of 102 patients were recruited through a convenient sampling technique using the Cochrane formula for sample size [12]. The inclusion criteria consist of individuals who have been diagnosed with JIA according to the criteria established by the International League of Associations for Rheumatology (ILAR). This ensures that all JIA subtypes and different illness durations are included, allowing for a varied range of clinical presentations to be captured. Patients with incomplete medical records or those diagnosed with other rheumatologic diseases were excluded from the study [13].

The research prioritizes ethical concerns and has obtained permission from the Institutional Review Board/Ethics Committee of the Khyber Teaching Hospital, Peshawar, with ethical approval reference no. KTH/med/23/273. Stringent protocols are implemented to maintain patient anonymity, and the need for informed consent is eliminated because the research is being conducted retrospectively. The data collection includes electronic health records, admission and discharge summaries, laboratory findings, and imaging studies. Crucial demographic data, including age, gender, and socioeconomic position, is extracted. Diagnostic assessments, including clinical evaluations, laboratory

testing such as ESR and CRP, and imaging examinations like X-rays and ultrasound, are documented.
Data analysis involves the use of statistical approaches with the aid of suitable software, such as SPSS 16. Descriptive statistics provide information on the demographic and clinical parameters, whereas subgroup analysis investigates variances within different subtypes of JIA. Correlation studies examine the connections between illness features, treatment methods, and results.

RESULTS

A total of 102 participants were included in this study as summarized in Table 1. The age distribution of the cohort is very diversified and it has a large number falling in the age group of 11-15 years which is the greatest among all n=55 (53.9%). According to the gender ratio, a small majority of male students n=63 (61.62%) to females n=39 (38.2%) can be seen. In terms of the diagnosis, the most common subtype of RF Negative JIA takes several n=45(44.1%) and the second RF Positive JIA takes place in n=26 (25.5%) of all cases. The most frequent type of persistent Oligoarticular JIA that affects n=11(10.8%) of patients and Enthesitis-Related as well as Systemic JIA shape n=9 (8.8%) and n=6 (5.9%) of cases, respectively. The presence of endothelial pain is understood in n=84 (82.4%) of cases and the application of a gate probe is seen in n=74 (72.5%). The fact is that n=47 (46.1%) of the patients exhibit fever, and of the patients report n=35 (34.3%) of them with lower back pain. Rashes are not seen very often 10 (9.8%), and the pain in the neck is recorded in n=46 (45.1%) out of cases. On this background, it should be noted that half of the respondents naming symptoms that last as long as 36 months or more is considerable n=55 (53.9%). The conclusions of this study supply a broad picture of the clinical presentation of JIA patients and underscore the heterogeneity of the recognized manifestations in the applied series of cases.

Table 1: Demographic and clinical characteristics of Juvenile Arthritis patients

Variables		n (%)
Age Group	1-5 Years	8 (7.8%)
	6-10 Years	17 (16.7%)
	11-15 Years	55 (53.9%)
	16-20 Years	19 (18.6%)
	21-25 Years	3 (2.9%)
Gender	Male	63 (61.8%)
	Female	39 (38.2%)
Diagnosis	Polyarticular RF Negative JIA	45 (44.1%)
	Polyarticular RF Positive JIA	26 (25.5%)
	Oligoarticular JIA Persistent	11 (10.8%)
	Oligoarticular JIA	4 (3.9%)
	Enthesitis-Related arthritis JIA	9 (8.8%)
	Systemic JIA	6 (5.9%)
	Extended	1 (1%)
Enthesial Pain	Yes	84 (82.4%)
	No	18 (17.6%)
Gate Probe	Yes	74 (72.5%)
	No	28 (27.5%)
Fever	Yes	47 (46.1%)
	No	55 (53.9%)
Lower Back Pain	Yes	35 (34.3%)
	No	67 (65.7%)
Rashes	Yes	10 (9.8%)
	No	92 (90.2%)
Neck Pain	Yes	46 (45.1%)
	No	56 (54.9%)
Duration of Symptoms	< 6 Months	10 (9.8%)
	6-12 Months	14 (13.7%)
	13-24 Months	19 (18.6%)
	25-35 Months	4 (3.9%)
	> 36 Months	55 (53.9%)

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The parameters of laboratory and treatment are demonstrated in Table 2 where the patients will undergo the examination and the treatment of the juvenile arthritis. Hb levels (HB) show a normal distribution. Here n=45(44.1%) of samples were found at normal levels and n=57(55.9%) were found at high levels. Hepatic functions marked particularly by the Hepatitis C Virus (HCV) range from high to normal to low in n=12(11.8%), 22.2%, and equal amounts respectively. Mean Corpuscular Hemoglobin (MCH) peaks have tri-modal distributions revealing high levels in n=1(1%), normal levels in n=39(38.2%), and low levels in 62(60.8%). In almost n=62(60%) of patients, TLC usually falls within normal limits, while there is an n=41(40.2%) of patients who possess an elevated count. The platelet levels had a range, with n=56(54.9%) labelled as high, n=43(42.2%) as normal, and n=3(2.9%) as low. In layman's terms, about n=14(13.7%) of the cases are ANA positive and 25(24.5%) of the cases are RA Factor positive. The rate of Erythrocyte Sedimentation Rate (ESR) and C-reactive protein (CRP) are n=83(81.4%) and n=56(54.9%) respectively, and these indicate the degree of inflammation. Alanine aminotransferase (ALT) levels reflected mostly the results of normality n=94(92.2%) The most prescribed medicine is methotrexate used in 75.5% of cases, while the use of leflunomide is less prevalent taken in n=20(19.6%) of cases. About n=6(5.9%) of patients who control preventive Hydroxychloroquine, and also n=7(6.9%) of patients, who control preventive Sulfasalazine are prescribed.

Table 2: Laboratory and treatment parameters in Juvenile Arthritis patients.

Parameters		Frequency	Percentage
HB (g/dL)	High	57	55.9
	Normal	45	44.1
	Low	0	0
MCV (fL)	High	12	11.8
	Normal	45	44.1
	Low	45	44.1
MCH (pg)	High	1	1
	Normal	39	38.2
	Low	62	60.8
TLC (10^3/ul) 4000 to 11,000	High	41	40.2
	Normal	61	59.8
Platelets (10^3/ul)	High	56	54.9
	Normal	43	42.2
	Low	3	2.9
ANA	Positive	14	13.7
	Negative	88	86.3
RA Factor	Positive	25	24.5
	Negative	77	75.5
ESR	High	83	81.4
	Normal	19	18.6
CRP	High	56	54.9
	Normal	46	45.1
ALT	High	8	7.8
	Normal	94	92.2
Methotrexate	Yes	77	75.5
Leflunomide	Yes	20	19.6
HCQ	Yes	6	5.9
SSZ	Yes	7	6.9

Table 3 reflects a systematic presentation of the clinical parameters from heterogeneous genetic subtypes of juvenile arthritis, which could be relevant for a better understanding of the diverse picture of symptom appearance in different pathological conditions. According to age distribution findings, there is no relevance at a value of (P = 0.676) regardless of the subtypes. The highest frequency among all classes belongs to the 11-15 years age range. The substantial gender differences

(P = 0.014) are noted with males being higher in prevalence in the Polyarticular RF Negative JIA (n=31), Oligoarticular JIA Persistent(n=8), and Enthesitis-Related JIA(n=9), although the female majority is noticeable in Polyarticular RF Positive JIA(n=16) and Systemic JIA(n=4). The fever incidence, however, does not show a significant relationship between the two forms of JIA: Polyarticular RF Negative JIA and Polyarticular RF Positive JIA (P = 0.176). Rashes are presenting with significant differences across subtypes (P = 0.001), and Polyarticular RF Negative JIA Enthesitis-Related arthritis JIA subtypes are the ones that are showing higher rates of incidence than the others. The combined use of the detailed GRM analysis and provided p-value puts a clear light on the clinical profiles, which can be used to assess the complexity of the pathogenesis in JA subtypes which leads to a thorough and more understandable understanding of the intricate heterogeneity in symptom manifestation

Table 3: Distribution of clinical parameters across different subtypes of juvenile arthritis by using Chi-square test.

Parameters		Polyarticular RF Negative JIA	Polyarticular RF Positive JIA	Oligoarticular JIA Persistent	Oligoarticular JIA	Enthesitis-Related arthritis JIA	Systemic JIA	Extended	p-value
Age Group	1-5 Years	3	1	2	1	1	0	0	0.676
	6-10 Years	7	3	2	0	1	3	1	
	11-15 Years	26	15	4	3	5	2	0	
	16-20 Years	8	5	3	0	2	1	0	
	21-25 Years	1	2	0	0	0	0	0	
Gender	Male	31	10	8	2	9	2	1	0.014
	Female	14	16	3	2	0	4	0	
Fever	Yes	24	11	3	2	2	5	0	0.176
	No	21	15	8	2	7	1	1	
Rashes	Yes	5	0	0	0	0	5	0	0.001
	No	40	26	11	4	9	1	1	
Lower Back Pain	Yes	19	9	0	0	6	1	0	0.023
	No	26	17	11	4	3	5	1	
Enthesial Pain	Yes	41	20	8	2	8	5	0	0.076
	No	4	6	3	2	1	1	1	
Gate Problem	Yes	32	16	9	3	8	6	1	0.221
	No	13	10	2	1	1	0	0	
Neck Pain	Yes	25	16	0	0	5	0	0	0.001
	No	20	10	11	4	4	6	1	
Duration of Symptoms	< 6 Months	4	3	0	3	0	0	0	0.0001
	6-12 Months	8	1	2	0	3	0	0	
	13-24 Months	8	6	2	0	1	2	0	
	25-35 Months	1	0	2	0	0	0	1	
	> 36 Months	24	16	5	1	5	4	0	

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Table 4 is a specific investigation of chosen clinical signs and symptoms revealed during the diagnostic examination of juvenile arthritis patients of different subtypes, which then allows the reader to make comparisons between the disease categories. The hemoglobin Percentage (HB%) distributed is not different (P = 0.228) across the three subdivisions. The histogram graph shows low HB%(n=26) in the cases of Polyarticular RF Negative JIA and Oligoarticular JIA Persistent(n=6). Treatment response of HCV is not significantly influenced by subtype and a P-value of 0.236 was achieved. The prevalence of HCV level in polyarticular negative RF JIA is stronger as compared to the low HCV level(n=17). The most significant difference among these subtypes is mean corpuscular hemoglobin (MCH) levels, with no statistical significance (P = 0.925) for high(n=1), low (n=28), and normal (n=16) categories in distribution. Total Leukocyte Count (TLC) does not show a significant change among the different types of cases displayed (P = 0.386), being mostly limited to normal limits (n=23). Coefficient variation for platelet counts demonstrated no change (P=0.848)while the equivalent spread in the different types was balanced with importance to the high, normal, and low categories. Autoimmune markers, for example, Antinuclear Antibodies (ANA) and RA Factor, do not show any statistical significance as to the distribution (p = 0.594, and p = 0.002 respectively). A high prevalence of RA factor-positive afflictions is found in the kind of JIA that affects multiple joints in Polyarticular RF-positive JIA. Higher ESR, as well as CRP, were discovered among all subtypes of patients with glial neoplasms with slight differences, however, without connection to their subtype. Only ALT levels do change not proving to be different (P = 0.586) between subtypes of manic depression, represented by the normal distribution of these variables. On treatment-related parameters, the multivariate regression of the usage of MTX, Leflunomide, HCQ, and SSZ displayed no statistically significant differences among the subtypes (P = 0.177, P = 0.869, P = 0.665, and P = 0.931, respectively).

Table 4: Distribution of clinical parameters across different subtypes of Juvenile Arthritis.

Parameters		Polyarticular RF Negative JIA	Polyarticular RF Positive JIA	Oligoarticular JIA Persistent	Oligoarticular JIA	Enthesitis-Related arthritis JIA	Systemic JIA	Extended	P-value
HB%	Normal	19	12	5	3	5	0	1	0.228
	Low	26	14	6	1	4	6	0	
HCV	High	6	1	2	2	1	0	0	0.236
	Normal	22	12	4	1	4	1	1	
	Low	17	13	5	1	4	5	0	
MCH	High	1	0	0	0	0	0	0	0.925
	Normal	16	9	5	3	3	2	1	
	Low	28	17	6	1	6	4	0	
TLC	High	22	9	5	1	1	3	0	0.386
	Normal	23	17	6	3	8	3	1	
Platelets	High	27	15	4	2	4	4	0	0.848
	Normal	17	10	7	2	4	2	1	
	Low	1	1	0	0	1	0	0	
ANA	Positive	5	6	0	1	1	1	0	0.594
	Negative	40	20	11	3	8	5	1	
RA Factor	Positive	3	14	3	1	3	1	0	0.002
	Negative	42	12	8	3	6	5	1	

ESR	High	36	23	7	3	8	5	1	0.692
	Normal	9	3	4	1	1	1	0	
CRP	High	25	12	8	2	6	3	0	0.671
	Normal	20	14	3	2	3	3	1	
ALT	High	2	3	2	0	0	1	0	0.586
	Normal	43	23	9	4	9	5	1	
Methotrexate	Yes	38	19	9	2	4	4	1	0.177
	No	7	7	2	2	5	2	0	
Leflunomide	Yes	8	6	1	1	3	1	0	0.869
	No	37	20	10	3	6	5	1	
HCQ	Yes	3	1	1	1	0	0	0	0.665
	No	42	25	10	3	9	6	1	
SSZ	Yes	4	2	1	0	0	0	0	0.931
	No	41	24	10	4	9	6	1	

SSZ; Sulfasalazine, RF; Rheumatic Fever, JIA; Juvenile Ideopatic Arthritis, ESR; Erytrocyte Sedimentation Rate, HB; Haemoglobin, HCV; Hematocrit Volume, TLC; Total Leukocyte Count; CRP; C-Reactive Protein, HCQ; Hydroxychloroquine, ALT; Alanine Aminotransferase, MCH; Mean Corpuscular Hemoglobin

DISCUSSION

The current study revealed the JIA and several similarities and differences become apparent about prior investigations. The study's demographic profile reveals a notable proportion of men (61.8%) primarily falling within the 11-15 age bracket, which closely corresponds to the data provided by Samia Bano. Bano's study additionally indicated a median age of presentation, indicating that JIA predominantly impacts mid-childhood. This period is crucial for timely intervention and precise diagnosis, aligning with our previous findings on the highest age at which JIA typically manifests [9].

The present study provides a comprehensive examination of different subtypes of JIA, specifically focusing on the prevalence of Polyarticular RF-negative JIA. These findings align with previous research conducted by Vinaya Kunjir [14] and Chang-Ching Shen [15]. Kunjir's research, carried out on a group of Indian individuals, also emphasized the high occurrence of Polyarticular RF Negative JIA, highlighting the possibility of genetic or environmental factors that affect the disease in various populations [14]. In comparison, Shih's study conducted in Taiwan revealed a significantly elevated incidence of Enthesitis-Related Arthritis (ERA), surpassing the prevalence observed in our group. The observed disparity may indicate the presence of regional or ethnic disparities in the symptoms of JIA, hence necessitating additional research to explore the distinct experiences of other groups with JIA [16].

Additionally, as elucidated in our research, the enduring and intense nature of symptoms, such as endothelial pain, fever, and chronicity of symptoms, align with the clinical intricacies emphasized in Hardal's comprehensive examination of JIA [17]. Both our study and Kim's review highlight the incapacitating and enduring characteristics of JIA, necessitating comprehensive care approaches to avert enduring impairments and enhance the quality of life. This is consistent with Bano's research, which found that individuals with longer disease durations were more likely to have joint abnormalities. Our data strongly supports this conclusion, as many patients experienced symptoms lasting longer than 36 months. The study findings indicate that the treatment strategies employed, primarily the administration of methotrexate, demonstrate a consistent pattern observed in other studies, including Shen's, which highlighted a notable dependence on disease-modifying anti-rheumatic medications. The regularity of treatment emphasizes the importance of methotrexate as a fundamental component in the management of JIA. However, it also emphasizes the need for continual assessment to enhance therapeutic strategies, considering the disease's frequently recurring or consistently active progression. Furthermore, our research provides novel perspectives on the gender-specific occurrence of distinct subtypes of JIA, which exhibited notable variations. Although not given as much emphasis in the examined papers, this element implies that gender may have an impact on the manifestation and advancement of diseases. This offers a new viewpoint that could inform the future study and the development of customized treatment approaches.

JIA is a valuable contribution to the existing literature, and it provides a thorough analysis of the different aspects including the demographic, clinical, and laboratory. The demographic findings of this research agree with the previous studies, which revealed high self-reporting during the 11-15 age

period and slight male predominance[18,19]. The notion that around 41.9 % also have Polyarticular RF Negative JIA mentioned is emphasized in JA cohorts. Of note, the cases having no clear subtype, although rare, are exceptional examples, with this fact implying that perhaps there are more subtypes not reported commonly.

It is consistent with previous research to indicate a peak incidence in the 11-15 age group and a slight male predominance [20, 21]. The prevalence of Polyarticular RF-negative JIA is consistent with the literature, emphasizing its prevalence in JA cohorts [22, 23]. A particularly interesting aspect of the extended subtype, despite its infrequency, is that it suggests potential subtypes not commonly reported.

JIA is characterized by chronic and systemic symptoms, as indicated by the reported prevalence rates of enthesis pain, fever, lower back pain, and duration of symptoms [24, 25]. JA has a multifaceted clinical presentation that reflects its heterogeneity. There are established patterns in the distribution of laboratory parameters in JA, with elevated inflammatory markers (ESR and CRP) and diverse hematological profiles [26, 27].

Methotrexate dominates the treatment-related parameters, which is consistent with its established role as a cornerstone in JA management [28]. In the face of variability in treatment approaches, fewer patients utilized Leflunomide, Hydroxychloroquine (HCQ), and Sulfasalazine (SSZ) [29]. To understand the heterogeneity of JA within the disease spectrum, it is important to analyze clinical parameters across subtypes of JA. The age and gender distribution differences between subtypes are in line with previous research, emphasizing the need for subtype-specific considerations in clinical management [29]. In addition, the presence of neck pain and rashes differs significantly between subtypes, offering new insights into possible subtype-specific characteristics. Based on the duration of symptoms analysis, a substantial proportion of patients have experienced symptoms for over 36 months, emphasizing the chronic nature of JA. In addition to enhancing the robustness of the findings, these p-values provide statistical validation of these clinical observations.

It is important to recognize that the research has several limitations despite the insightful discoveries made. First off, since the retrospective design depends on pre-existing medical records, which could not include all pertinent clinical information, bias may be introduced. Second, the results may not be as applicable to other contexts or groups since the study's sample size was small and limited to a single tertiary care institution. Furthermore, the study's cross-sectional design makes it impossible to evaluate long-term results or the evolution of the illness over time. To confirm and build on these results, further studies using bigger, multi-center cohorts and prospective designs would help offer a more thorough comprehension of JIA and its varied clinical spectrum.

CONCLUSION

The study highlighted the considerable heterogeneity in the clinical manifestations, laboratory findings, and demographic characteristics of JIA patients. The findings indicated that the majority of the patients were male, with Polyarticular RF-negative JIA being the most prevalent subtype. The treatment predominantly involved methotrexate, emphasizing its central role in managing JIA. These results underscore the importance of early and accurate diagnosis, as well as tailored therapeutic strategies to address the diverse clinical presentations of JIA. By recognizing the significant associations between JIA and various clinical, laboratory, and demographic factors, healthcare providers can better understand the complexity of the disease and improve patient outcomes through more personalized care.

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ETHICAL APPROVAL

The permission was obtained from the Institutional Review Board/Ethics Committee of the Khyber Teaching Hospital, Peshawar, with ethical approval reference no. KTH/med/23/273 on dated 24/02/2023.

CONFLICT OF INTEREST

The authors have no conflict of interest.

AUTHORS CONTRIBUTION

MSS & IU: Designed, conceived the idea, registered trial, helped in data collection, and manuscript writing. AH & NP: Manuscript editing, statistical analysis. SAK: Data collection, data interpretation. MSS & KS: Did statistical analysis, final review, and manuscript editing. NP & KS: Supervised the entire study and was responsible for the integrity of the study

REFERENCES

1. Al-Mayouf SM, Al Mutairi M, Bouayed K, Habjoka S, Hadef D, Lotfy HM, et al. Epidemiology and demographics of juvenile idiopathic arthritis in Africa and the Middle East. Pediatric Rheumatology. 2021;19(1):166. https://doi.org/10.1186/s12969-021-00650-x

2. Harrold LR, Salman C, Shoor S, Curtis JR, Asgari MM, Gelfand JM, et al. Incidence and prevalence of juvenile idiopathic arthritis among children in a managed care population, 1996-2009. J Rheumatol. 2013;40(7):1218-1225. DOI: 10.3899/jrheum.120661
3. Horneff G, Borchert J, Heinrich R, Kock S, Klaus P, Dally H, et al. Incidence, prevalence, and comorbidities of juvenile idiopathic arthritis in Germany: a retrospective observational cohort health claims database study. Pediatric Rheumatology. 2022;20(1):100. DOI: 10.1186/s12969-022-00755-x
4. Thomas KN, Aggarwal A. Childhood rheumatic diseases: bites not only the joint but also the heart. Clinical Rheumatology. 2023;42(10):2703-2715. DOI: 10.1007/s10067-023-06621-9
5. Sur LM, Gaga R, Duca E, Sur G, Lupan I, Sur D, et al. Different Chronic Disorders That Fall within the Term Juvenile Idiopathic Arthritis. Life (Basel). 2021;11(5). DOI: 10.3390/life11050398
6. Zaripova LN, Midgley A, Christmas SE, Beresford MW, Baildam EM, Oldershaw RA. Juvenile idiopathic arthritis: from aetiopathogenesis to therapeutic approaches. Pediatr Rheumatol Online J. 2021;19(1):135. DOI: 10.1186/s12969-021-00629-8
7. Alberto M, Angelo R, Tadej A, Michael WB, Ruben B-V, Ruben C, et al. Toward New Classification Criteria for Juvenile Idiopathic Arthritis: First Steps, Pediatric Rheumatology International Trials Organization International Consensus. The Journal of Rheumatology. 2019;46(2):190. DOI: https://doi.org/10.3899/jrheum.180168
8. Eng SW, Duong TT, Rosenberg AM, Morris Q, Yeung RS. The biologic basis of clinical heterogeneity in juvenile idiopathic arthritis. Arthritis Rheumatol. 2014;66(12):3463-3475. DOI: 10.1002/art.38875
9. Bano S, Bosan K, Khurshid S, Rasheed U, Zeb A, Zammurrad S. Prevalence of Depression in Patients with Juvenile Idiopathic Arthritis Presenting at a Tertiary Care Hospital. Cureus. 2020;12(1):e6807. Doi: 10.7759/cureus.6807
10. Aslam J, Zaman H, Ubaid M. Reactive Protein can be used as a Diagnostic Tool for Acute Appendicitis. National Journal of Life and Health Sciences. 2022;1(1):13-15. DOI: https://doi.org/10.62746/njlhs.v1n1.7
11. Dave M, Rankin J, Pearce M, Foster HE. Global prevalence estimates of three chronic musculoskeletal conditions: club foot, juvenile idiopathic arthritis and juvenile systemic lupus erythematosus. Pediatric Rheumatology. 2020;18(1):49. DOI: https://doi.org/10.1186/s12969-020-00443-8
12. Singh A, Masuku M. Sampling Techniques and Determination of Sample Size in Applied Statistics Research: An Overview. International Journal of Commerce and Management. 2014;2:1-22. https://www.ijecm.co.uk/wp-content/uploads/2014/11/21131.pdf
13. Ben Tekaya A, Hannech E, Saidane O, Rouached L, Bouden S, Tekaya R, et al. Association between Rheumatic Disease Comorbidity Index and factors of poor prognosis in a cohort of 280 patients with rheumatoid arthritis. BMC Rheumatol. 2022;6(1):78. Doi: 10.1186/s41927-022-00308-5
14. Kunjir V, Venugopalan A, Chopra A. Profile of Indian Patients with Juvenile Onset Chronic Inflammatory Joint Disease Using the ILAR Classification Criteria for JIA: A Community-based Cohort Study. The Journal of Rheumatology. 2010;37(8):1756. DOI: 10.3899/jrheum.090937
15. Lin C-H, Lin C-L, Shen T-C, Wei C-C. Epidemiology and risk of juvenile idiopathic arthritis among children with allergic diseases: a nationwide population-based study. Pediatric Rheumatology. 2016;14(1):15. DOI: 10.1186/s12969-016-0074-8
16. Shih YJ, Yang YH, Lin CY, Chang CL, Chiang BL. Enthesitis-related arthritis is the most common category of juvenile idiopathic arthritis in Taiwan and presents persistent active disease. Pediatr Rheumatol Online J. 2019;17(1):58. DOI: 10.1186/s12969-019-0363-0
17. Hardal C, Erguven M, Saglam ZA. Systemic juvenile idiopathic arthritis as a fever of unknown origin. North Clin Istanb. 2017;4(1):81-84. Doi: 10.14744/nci.2016.07769
18. Golhen K, Winskill C, Yeh C, Zhang N, Welzel T, Pfister M. Value of Literature Review to Inform Development and Use of Biologics in Juvenile Idiopathic Arthritis. Frontiers in Pediatrics. 2022;10. DOI: 10.3389/fped.2022.909118
19. Zaripova LN, Midgley A, Christmas SE, Beresford MW, Baildam EM, Oldershaw RA. Juvenile idiopathic arthritis: from aetiopathogenesis to therapeutic approaches. Pediatric Rheumatology. 2021;19(1):135. DOI: 10.1186/s12969-021-00629-8
20. Mussadiq S, Verma RK, Singh DP, Bajpai PK, Begum N, Kumar S. An epidemiological study and trend analysis of laboratory confirmed COVID-19 cases among children in North India. J Family Med Prim Care. 2022;11(2):542-546. DOI: 10.4103/jfmpc.jfmpc_1239_21
21. Green MS, Schwartz N, Peer V. A meta-analytic evaluation of sex differences in meningococcal disease incidence rates in 10 countries. Epidemiol Infect. 2020;148:e246. DOI: 10.1017/S0950268820002356
22. Oberle EJ, Harris JG, Verbsky JW. Polyarticular juvenile idiopathic arthritis - epidemiology and management approaches. Clin Epidemiol. 2014;6:379-393. Doi: 10.2147/CLEP.S53168
23. Feger DM, Longson N, Dodanwala H, Ostrov BE, Olsen NJ, June RR. Comparison of Adults With Polyarticular Juvenile Idiopathic Arthritis to Adults With Rheumatoid Arthritis: A Cross-sectional Analysis of Clinical Features and Medication Use. J Clin Rheumatol. 2019;25(4):163-170. DOI: 10.1097/RHU.0000000000000819

24. Walsh JA, Magrey M. Clinical Manifestations and Diagnosis of Axial Spondyloarthritis. J Clin Rheumatol. 2021;27(8):e547-e60. DOI: 10.1097/RHU.0000000000001575
25. Bentaleb I, Abdelghani KB, Rostom S, Amine B, Laatar A, Bahiri R. Reactive Arthritis: Update. Current Clinical Microbiology Reports. 2020;7(4):124-132. DOI: https://-doi.org/10.1007/s40588-020-00152-6
26. Şener G, İnan Yuksel E, Gökdeniz O, Karaman K, Canat HD. The Relationship of Hematological Parameters and C-reactive Protein (CRP) With Disease Presence, Severity, and Response to Systemic Therapy in Patients With Psoriasis. Cureus. 2023;15(8):e43790. DOI: 10.7759/cureus.43790
27. Murakami J, Shimizu Y. Hepatic manifestations in hematological disorders. Int J Hepatol. 2013;2013:484903. DOI: 10.1155/2013/484903
28. Friedman B, Cronstein B. Methotrexate mechanism in treatment of rheumatoid arthritis. Joint Bone Spine. 2019;86(3):301-307. Doi: 10.1016/j.jbspin.2018.07.004
29. Harris JG, Kessler EA, Verbsky JW. Update on the treatment of juvenile idiopathic arthritis. Curr Allergy Asthma Rep. 2013;13(4):337-346. Doi: 10.1007/s11882-013-0351-2