UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
SCHOOL OF MEDICINE
DEPARTMENT OF PAEDIATRICS AND CHILD HEALTH

PATTERN AND TREATMENT OUTCOMES OF JUVENILE IDIOPATHIC ARTHRITIS IN KENYATTA NATIONAL HOSPITAL

DR MERCY KAMAU
(MBCHB UON)
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DECLARATION

This dissertation is my original work and has not been presented for the award of a degree in any other university

Signed.....Date.....

Dr Mercy Kamau,
Department of Pediatrics and Child Health, University of Nairobi.

This dissertation has been presented with our full approval as supervisors:

Signed.....Date.....

Prof Christine Yuko Jowi,

Associate Professor,

Department of Pediatrics and Child Health, University of Nairobi.

Signed..... Date.....

Dr L. Owino

Lecturer, Pediatric rheumatologist,

Department of Pediatrics and Child Health, University of Nairobi.

DEDICATION

To my beloved family and friends who have been my inspiration, source of support and encouragement throughout this project.

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I would like to thank the almighty God for giving me life and allowing me to complete this study.

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ABRREVIATIONS

ANA- anti nuclear antibody

CRP- C reactive protein

DMARDS- disease modifying anti rheumatic drugs

ERA- enthesitis related arthritis

ESR- erythrocyte sedimentation rate

HLA- human leucocyte antigen

HRQOL- health related quality of life

IgM- immunoglobulin M

ILAR- International league of associations for rheumatology

JADI- juvenile arthritis disease index

JADAS- Juvenile arthritis damage activity score

JIA- Juvenile idiopathic arthritis

JRA- juvenile rheumatoid arthritis

MHC- major histocompatibility complex

NSAIDS- non steroidal anti-inflammatory drugs

RF- rheumatoid factor

ABSTRACT

BACKGROUND

Juvenile idiopathic arthritis (JIA) is the most common rheumatic disease of childhood. Early diagnosis and appropriate management is important to prevent associated disease damage and disability.

OBJECTIVE

To determine the subtypes of JIA seen at the KNH pediatric rheumatology clinic and to determine their treatment and clinical outcomes.

METHODOLOGY

This was a cross sectional study. The study population was children between 1- 18 years. Patients were recruited from the KNH pediatric rheumatology clinic. The study period was 4 months. Data analysis was done using STATA software package.

RESULTS

The most common subtype of JIA found was polyarticular JIA 40%. The male to female ratio of the patients recruited into the study as 1:2.

The average time from the onset of symptoms till diagnosis was 6 months. Patients with active disease were 80% despite being on treatment. Damage was divided into intra and extraarticular damage. 48% of the patients seen had articular damage. Systemic and polyarticular JIA patients had more articular damage than patients with the other JIA subtypes.

Extra articular damage was also observed in 16% of the patients. One patient with polyarticular JIA was found to have uveitis.

CONCLUSION

The most common subtype of JIA from this study was found to be polyarticular. The male to female ratio was 1:2. The average time of diagnosis from onset of first symptoms was an average of 12 months. 48% of the patients had articular damage.

RECOMMENDATIONS

1. Health workers should be taught how to recognize JIA early for prompt institution of appropriate treatment.
2. Clinicians should be taught on the importance of screening for anterior uveitis early on all JIA patients.

1.0 INTRODUCTION AND BACKGROUND INFORMATION

Juvenille Idiopathic Arthritis (JIA) is an inflammatory disorder that's chronic in nature. It causes joint erosion in children and often progresses to disability.(1) It is one of the most common rheumatological disorders in childhood. JIA compromised 33% and 32% of all rheumatological disorders seen in a South African and an Indian study respectively.(2,3) However in a Kenyan study done by Migowa et al, JIA was was not as common as other rheumatological disorders. Out of the twenty six patients recruited into the study, none had JIA. (36) JIA is a part of a group of heterogeneous disorders that manifest with arthritis as a symptom. The pathogenesis of JIA is unknown. It seems to be related to both genetic and environmental factors.(4,5) JIA is classified into seven subtypes based on the International League of Associations for Rheumatology (ILAR) criteria.(6)

The disease is managed by use of disease modifying anti- rheumatic drugs (DMARDS), steroids and non-steroidal anti- inflammatory drugs (NSAIDS) to achieve remission and halt the damage for optimal growth. Traditional DMARDS include methotrexate, sulfasalazine, leflunomide and chloroquine. Many advances have been made in JIA management. One of the major advances is the introduction of biological agents. They have greatly improved long term outcome of patients and joint damage(7). Cerri.L et al found biologic agents to be very efficacious and safe in the management of JIA. (8). However access to these agents in developing countries is limited.

JIA is associated with articular as well as extra-articular manifestations. Patients develop disease and treatment related complications. Solati et al demonstrated that JIA causes severe disability in up to 20% of the children while 30% had damage in at least one joint group and 9% had growth retardation.(9). The most common extra-articular complication is chronic anterior uveitis. Lakshmi. M et al reported a prevalence of 17% for uveitis in patients with oligo articular JIA. Of all the children found to have chronic uveitis, 29% had marked visual loss (10).

2.0 LITERATURE REVIEW

2.1 EPIDEMIOLOGY

JIA worldwide has an incidence of 0.8-22.6/100,000 children per year. (6) There is disparity in the prevalence of disease subtypes between the various countries as shown by the EPOCA study (7). In Europe and USA oligoarticular JIA is the predominant subtype at 40-50% followed by polyarticular 25-30% while systemic JIA was at 5-15%.(6) However in developing countries like Costa Rica, New Zealand and South Africa polyarticular is the predominant subtype(11). The disease is higher in females with a female to male ratio of 2:1 in the west but in studies done in South Africa and India the male to female ratios have been reported to be equal (11). Olaosebikan et al in a Nigerian study also found polyarticular JIA as the most common subtype of JIA.(37) Age of onset in a series from the USA in the 1970s shows a peak incidence of JIA occurring at the age of 1-3 years with a preference for girls in this age group (12).A second less prominent peak was noted at 8-10 years with more boys in this age group with oligo articular JIA. (13) The disease began at a mean age of 4 years in females and 10 years in males (12, 13).

2.2 PATHOPHYSIOLOGY AND RISK FACTORS

The pathogenesis of JIA isn't completely understood. Immunologic susceptibility and triggers from an external source are considered necessary. Variants in Major histocompatibility Complex (MHC) class 1 and 2 regions have been shown to be associated with the various subtypes of JIA. Ombrello. M et al examined the (MHC) locus in a group of patients with JIA and verified the relationship between class 2 HLA region and systematic JIA. (14). The non HLA candidate loci are also associated with the various subtypes of JIA for instance polymorphism in genes encoding for tumor necrosis factor alpha, macrophage inhibiting factor, interleukin 6 and 1.

JIA is an immune mediated autoimmune disorder. It is mediated by the humoral and cellular arms of the immune system. (6) Type 1T lymphocytes release pro inflammatory cytokines that are specific for synovial and non-self-antigens as evidenced by increased number of activated T lymphocytes within synovial fluid taken from patients with JIA. (15) For the humoral immune system, B cells are activated, immune complexes are formed and complement system activated hence promoting inflammation (6)

Certain cytokine allele inheritance predisposes to severe disease and systemic disease. All these anomalies in the immune system usually cause joint inflammation that manifests as hypertrophy, hyperplasia, hyperemia and edema in the synovium. T lymphocytes also influx into the joint and play a role in the inflammatory process.

Possible non genetic factors include bacterial and viral infections. A study done in Canada in 1992 by Oen.K et al showed that Mycoplasma Pneumoniae infection incidence peaks coincide with JIA incidence peaks (16). Another study done by Ogra.P et al showed that rubella virus antibody levels were higher in children with JIA (17). Abnormal reproductive hormone levels and joint trauma are also thought to play a role. (6)

A few studies have also found a connection between the use of antibiotics and the development of JIA. The underlying mechanism is unknown but the alteration in the intestinal microbiome and immune dysregulation has been postulated to be a probable cause. A study done in the UK in 2015 by Horton.D et al showed that those exposed to antibiotics had higher risk of developing JIA. However, exposure to other non-bacterial antimicrobial agents like antiviral and antifungal drugs was not associated with an increased risk of JIA development. (18)

2.3 CLINICAL PRESENTATION

Clinically JIA presents with arthritis which has been present for six weeks, the onset of disease is usually insidious or abrupt with morning stiffness after a long period of inactivity. The affected joint usually has reduced range of motion, tender and painful. Arthritis usually occurs in the large joints especially the knees. The affected limb may become longer due to continued production of pro inflammatory cytokines systemically which have effect on the growth plate of long bones.(19) On the contrary, inflammation can also cause premature growth plate closure which may cause bones to be shortened. Uncontrolled disease can lead to uncontrolled hypertrtrophy of the synovium and progressive erosion of cartilage as well as bone. Systemic JIA presents with arthritis in one joint preceded by a fever over 2 weeks and either lymhadaenopathy, serositis, hepatosplenomegally or an evanescent rash. Polyarticular JIA is divided into rheumatoid factor positive and negative. It presents as arthritis affecting > 5 joints occurring within the first six months of disease. Enthesitis related arthritis usually presents with arthritis or enthesis with two of the following symptoms; tenderness in the sacroiliac joint,

HLAB27 antigen positive, arthritis in a male greater than the age of 6 years and acute anterior uveitis.

Oligoarthritis usually presents as arthritis affecting 1- 4 joints during the initial six months of disease. Psoriatic arthritis usually presents with arthritis and psoriasis with at least two of dactylitis, nail pitting or psorisis in a first degree relative. Undifferentiated arthritis doesn't fall into any of the above mentioned categories.

TABLE 1: ILAR CLASSIFICATION OF JIA

CATEGORY	DEFINITION	EXCLUSION
Systemic	1. arthritis affecting one joint 2. preceded by fever for the past 2 weeks accompanied by: • evanescent rash • generalized lymphadenopathy • hepato/splenomegaly • serositis	1. Psoriasis/ history of psoriasis in 1st degree relative 2. Arthritis HLAB27 positive boy beginning after 6th birthday 3. presence of IgM rheumatoid factor on 2 occasions 3 month apart 4. Ankylosingspondilitis, enthesitis related arthritis (ERA), inflammatory bowel disease, uveitis and history of above in first degree relative
Oligo arthritis	Arthritis in 1- 4 joints occurring the first 6 months of JIA	1,2,3,4 above 5. presence of systemic JIA
Polyarthritis (RF negative)	• Arthritis in >5 joints occurring in the first six months of disease • RF negative	1,2,3,4,5 above
Polyarthritis (RF positive)	• Arthritis in > 5 joints during the first 6 months of diseases • two RF positive tests 3months apart during the first 6 months of disease	1,2,4,5 above
Psoriatic arthritis	Arthritis and psoriasis with any 2 of the following: • dactylitis • pitting of the nails • first degree relative with psoriasis	2,3,4,5 above

CATEGORY	DEFINITION	EXCLUSION
Enthesitis related arthritis	Arthritis/ enthesitis or both with two of the following: • Tenderness in the sacroiliac joint • HLAB27 antigen • onset of arthritis in a male >6 years • acute anterior uveitis symptoms • history of ankylosing spondylitis, ERA, inflammatory bowel disease and acute anterior uveitis in a first degree relative	1,3,5 above
Undifferentiated arthritis	Arthritis that doesn't fulfil any of the above criteria	

2.4 DIAGNOSIS AND MANAGEMENT

JIA diagnosis is usually done on the basis of history and physical examination. No definitive diagnostic tests exists. It's not uncommon for all laboratory investigations to be normal in a patient with JIA.(6,19) Laboratory investigations may however be necessary in a patient with suspected JIA to help rule out other disorders that may mimic JIA and to help classify the disease.(6)

Erythrocyte sedimentation rate (ESR) and C- reactive protein (CRP) may be elevated in patients with polyarticular and systemic JIA. A complete blood count may reveal lymphopenia which occurs due to immigration of activated lymphocytes into the synovium from circulation.

Anti-Nuclear Antigen (ANA) is positive in 70% of the children with oligo articular JIA.(20) A positive ANA is usually a marker for increased risk of anterior uveitis especially in children whose onset of arthritis was <6 years.(1)

Rheumatoid factor (RF) may be positive in children with JIA and children without JIA it is therefore not useful in the diagnosis of JIA. RF is performed in polyarticular JIA due to its prognostic significance (21).

Anti CCP antibodies aren't normally done in JIA patients but it may indicate severity of JIA. (22) HLAB27 should be done in patients who present with enthesitis because it may predict the likelihood of developing axial arthritis. (23)

Radiographs are the quickest and most readily available method of evaluating joint involvement. Ultrasounds are the best imaging modality used to evaluate fluid within joints like the hip and shoulder because clinical assessment of fluid within this joints clinically may be difficult (2). Magnetic resonance imaging is also a powerful tool that may be used in demonstrating cartilage damage, joint erosion, loss of joint space and ligament involvement (24).

The end goal when managing JIA is to control pain, to prevent further joint damage and to prevent the loss of joint function keeping in mind that the rate of disease progression in JIA can be very rapid.(7) JIA has periods of remission and flare ups. Treatment is targeted at controlling the flare ups and remission.

During management of the disease, NSAIDS are useful in controlling pain as well as inflamation. Disease modifying anti rheumatic drugs (DMARDS) help in retarding and preventing disease progression therefore prevent joint destruction and loss of function. They however take some time to take effect. Corticosteroids are also potent anti-inflammatory drugs used to bridge time until DMARDS are effective. However, the adverse effects of corticosteroids make their use short term. Biological agents are very useful in the management of JIA since they retard joint erosion, improve signs and symptoms and improve the quality of life in JIA patients. (7)

2.5 COMPLICATIONS AND OUTCOMES OF JIA

JIA is an inflammatory disease that is chronic in nature. It often causes disability in children. As children with JIA reach adulthood, the disease may continue. (1, 25) The damage in JIA is divided in to articular and extra articular damage. They also face medication associated

morbidity, emotional and social dysfunction, mortality and economic burden on care givers. The disease impairs various aspects of both patient and caregiver lives. (1)

2.5.1 DISABILITY

Several studies have been done to show the extent of disability associated with JIA. A cross sectional study conducted by Solati et al in Italy over a period of 5 years in which 310 children with JIA were enrolled in. It showed that 20% of the children had severe disability, 30% had damage in at least one joint group, 25% showed extra articular damage while 9% had growth retardation.(1,9) Active disease, disability and impaired function cumulates the burden on the patient and generally on the health resources in the hospitals.(1) Articular damage due to JIA is assessed using the Juvenile arthritis damage index score (JADI). It is a tool that is designed to grade the severity of articular and extra articular damage in JIA patients. It is divided into two parts. JADI-A is for assessing articular damage with a total score of 72 while JADI-E is for assessing extra articular damage with a total score of 17. A score of > 0 is considered significant indicating damage.(36) The articular damage score assesses all the joints for damage while the extra articular damage score assesses for presence of ocular damage, endocrine issues, and musculoskeletal damage.

2.5.2 VISUAL OUTCOMES

Children with JIA are at a higher risk of developing uveitis and potential loss of vision. A retrospective study done in the USA by Sabri.k et al where 1081 patients under 18 years of age were enrolled in the study revealed 13% of the patients developed uveitis after following them up for 6 years. 15% with uveitis underwent 62 ocular surgeries. Good visual acuity was found in 91% of the patients. Impaired visual acuity was found in 3% of the patients and blindness was found in 6% of the patients. (26)

Another retrospective study was done by Sakarin.A et al in the United States her study had 55 patients with uveitis as a result of JIA. From the records, at 7 years 42% of the patients developed cataracts while 51% had developed cataract after 24 years. 5% developed glaucoma after 7 years and 22% developed glaucoma after 24 years. (27)

Uveitis can cause lifelong complications which include lifelong medication, eye surgeries and loss of vision which in the long run impairs the quality of life (1, 20). The American Academy of Pediatrics guidelines therefore recommends that children with oligo articular and polyarticular RF positive and ANA positive JIA < 7 years and have been diagnosed with JIA for< 4years get 3- 4 monthly screening for uveitis since they have an increased risk for developing uveitis.(28)

2.5.3 PHYSICAL ACTIVITY

Leliveld.M et al conducted a study on the physical activity and adolescents with JIA. He found that physical activity levels were reduced in 30 adolescents with JIA compared to 106 patients without JIA. Only 23% of patients with JIA met public health guidelines on physical activity compared to 66% of the patients in the control group. (29, 1)

2. 5.4 IMPACT ON HEALTH RELATED QUALITY OF LIFE

Several studies have been done on the impact of JIA on the health related quality of life (HRQOL). A German study done by Muller et al in 2005 showed that children with JIA had a lower HRQOL in relation to their self-esteem while adolescents had reduced HRQOL in relation to their generalized well-being and quality of life. One fifth had behavior problems with social isolation. Functional limitations, anxiety and depression were the main determinants of poor HRQOL. (30)

In another study by Petersen.C et al I Germany showed that HRQOL was decisively influenced by consequence of the health condition. The study showed that those in pain and those who had joint limitations had poorer HRQOL. (31, 1)

3.0 JUSTIFICATION AND UTILITY

3.1 JUSTIFICATION

Very few studies on JIA have been done in Kenya. Studies have shown that the commonest JIA subtypes vary in various geographical areas. A survey in this field was helpful in determining the commonest subtype seen in Kenyatta National Hospital. Furthermore, the complications management and treatment outcomes vary with the various JIA subtypes. A study in this field is therefore helpful in influencing our management and our way of practice.

3.2 UTILITY

JIA is a chronic disorder that often presents with arthritis. Other more common conditions may mimic JIA . A study in this field will influence our way of management by helping us suspect JIA early for patients presenting with symptoms of arthritis. It will also help influence our practice and informs practice.

4.0 RESEARCH QUESTION AND STUDY OBJECTIVES

4.1 RESEARCH QUESTION

What is the pattern, treatment and outcome of juvenile idiopathic arthritis seen in Kenyatta National Hospital rheumatology clinic?

4.2 STUDY OBJECTIVES

PRIMARY OBJECTIVE

1. To determine distribution of various subtypes of JIA for the patients seen in Kenyatta National Hospital pediatric rheumatology clinic.

SECONDARY OBJECTIVE

1. To determine the clinical outcomes of children managed for JIA in Kenyatta National Hospital pediatric rheumatology clinic.
2. To determine the treatment modalities of children with JIA seen in KNH pediatric rheumatology clinic.

5.0 METHODOLOGY

5.1 STUDY DESIGN

Cross sectional study

5.2 STUDY POPULATION

Children between the ages of 1-18years who were diagnosed with JIA. The diagnosis satisfied the ILAR criteria of diagnosing JIA. This was ensured by going through the patient's medical records to ensure that correct investigations and physical evaluation was done before making the diagnosis.

5.3 STUDY LOCATION

Patients were recruited for the study in the KNH pediatric and adult outpatient rheumatology clinic. Both clinics take place on Thursdays in the afternoon concurrently at the same venue. The clinic has an average of 50 patients out of which 6 are usually children under the age of 18 yrs.

5.4 STUDY PERIOD

The study was conducted over a period of 4 months.

5.5 STUDY OUTCOMES

- Determination of the subtypes of JIA as seen in KNH
- Description of the clinical outcomes associated with JIA in KNH.
- Determination of the treatment modalities used in management of JIA in KNH.

6.0 SELECTION AND ENROLLMENT OF PARTICIPANTS

6.1 Inclusion criteria

- All cases of JIA diagnosed in children 1 -18 years.
- All children whose diagnosis was verified using ILAR criteria.
- The children had a written informed consent from their primary care givers in order for them to be enrolled in the study.
- Children above the age of 12 years also gave assent for them to be enrolled in the study.

6.2 Exclusion criteria

- All cases that are suspected to have JIA but didn't satisfy the accepted diagnostic criteria.
- All patients diagnosed with JIA that didn't consent to be enrolled in the study.

6.3 SAMPLE SIZE DETERMINATION

The study was conducted only during the study period involving all the JIA patients seen in the pediatric rheumatology clinic and adult rheumatology that satisfied the inclusion criteria.

The Sample Size was determined using Fischer's Formula for Sample Size Determination in Prevalence studies:

$$m = \frac{z^2 p(1-p)}{d^2} =$$

$$d = \sqrt{\frac{z^2 p(1-p)}{m}} = \sqrt{\frac{(1.96^2)\,(0.15\times 0.85)}{50}} = 0.1$$

- m = sample size taken as 50
- z = Normal Standard Deviation taken with a 95% Confidence Interval; set at 1.96.
- p = Expected Prevalence of systemic JIA 15% as determined by the EPOCA study(7)
- d = gives a study precision of 9.8%

According to the above formula the sample size was 50.

6.4 STUDY PROCEDURE

The potential study participants were identified by screening the pediatric rheumatology and adult rheumatology clinic registers on clinic days before the start of clinic. Their files were retrieved and reviewed for whether they met the eligibility criteria. A determination was made with the clinical presentation, investigations, treatment, current disease activity and damage.

Patients who met the eligibility criteria were approached and written and informed consent was sought from the primary care giver assent was also sought from the patients above 12 yrs of age. Those that gave consent were enrolled into the study and a written consent form copy was given to them and the second copy remained with the primary investigator.

The data was collected in form of a questionnaire. The modified epidemiology treatment and Outcome of JIA (EPOCA) questionnaire was used to collect the data by the researcher.

7.0 DATA COLLECTION, MANAGEMENT AND ANALYSIS

7.1 DATA COLLECTION

After selection and enrollment of study subjects, data was collected from the children and their guardians using a questionnaire administered by an interviewer. The participants were also assessed physically and if necessary relevant lab investigations ordered.

7.2 PARTICIPANT INTERVIEW AND QUESTIONAIRE

All participants and guardians who gave consent were interviewed with a structured questionnaire which assessed the following from the patient:

- the patients demographic details
- the family socio economic status
- date of onset of disease and diagnosis
- family history of autoimmune diseases

The investigators then assessed all the patients and did a physical exam. The investigator assessed the following:

- The Juvenile Arthritis Damage Index score (JADI) to assess the extent of damage due to arthritis
- Looked at the file for the type of medication the patient had been on
- Assessed the disease status and its severity
- Did an examination of all the joints

The investigator then extracted the following information from the file:

- Patients clinical and laboratory information that was available in the file. Some of the lab tests that were missing weren't done because most of the patients could not afford the tests however those who could afford it, the lab tests were done and recorded.
- Uveitis screening.

7.3 DATA MANAGEMENT AND ANALYSIS

Collected data was entered in the computer storage program EPIDATA. Data verification was done manually by proof reading. The stored data was readily available whenever it was needed for analysis.

Data analysis

Data analysis was done by STATA 11 software package. Descriptive statistics were calculated for continuous variables such as age. Means and standard deviations for normal data and median with interquartile ranges were calculated.

8.0 CONTROL OF ERRORS AND BIASES

1. Each interviewer administering the questionnaire during an interview session had a copy of the study definitions and terminologies to ensure uniform interpretation of the results.
2. Each researcher was properly trained by a pediatric rheumatologist on how to examine all the patients' joints in order for them to accurately fill the JADI articular damage form.
3. The principal investigator assessed the responses to questionnaires administered and the clinical assessment forms on a daily basis to oversee data entry and ensure the validity of the collected data

9.0 ETHICAL CONSIDERATIONS

1. Permissions was sought from the KNH- UON Ethics and Research Committee (ERC) to collect and analyze data collected in the study is part of the requirements for MMED thesis dissertation. Copies of this protocol, the informed consent form were presented to the Ethics and Research Committee for written approval before commencing the study.
2. The of the study was carefully explained to the children's parents or guardians with a view to obtaining written consent prior to enrolling any child in the study. Any photos or images taken from the patients were taken with full consent from the patients and the guardians.
3. No experimental investigations or products were employed in this study.
4. Confidentiality was observed during the whole study period, by participating investigators and the institution the study was conducted in. Those who participated in the study were given study identification numbers and no personal identification data was recorded. No Information concerning the study findings was released to any unauthorized parties.
5. The overall study findings will be availed the specialists and staff running the respective outpatient clinics in hopes of disseminating the knowledge gained about JIA management and outcomes in children on follow-up in their facilities thereby contributing to the improvement of care delivered to this subset of children. The study findings will also be presented to the University of Nairobi (UON) department of Pediatrics and Child Health academic staff and students in fulfillment of the requirements of the M.Med program.

10.0 RESULTS

Sociodemographic data

A total of 50 children aged 1 – 18 years were enrolled in the study. The median age of children was 11 years ±5. Out of a total 50 children 16 were male and 34 were female. The male to female ratio was 1: 2.

TABLE 2: SOCIODEMOGRAPHIC DATA FOR CHILDREN RECRUITED INTO THE STUDY

CHARACTERISTIC	CATEGORY	N(50)
Gender	Male	16 (32%)
	female	34 (68%)
Social economic status	Low	39 (78%)
	Average	11 (22%)
	High	0
Mean age years Median	11 years ± 5 11 years (9-14) IQR	

Subtypes of JIA

Out of the 50 children, polyarticular JIA subtype was at 40% followed by ERA at 28% as seen in figure 1

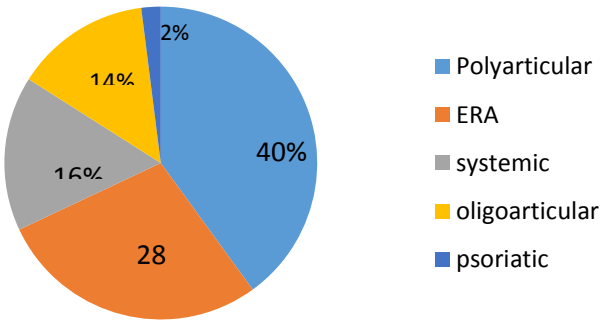


FIGURE 1: SUBTYPES OF JIA

There were no cases of undifferentiated JIA found.

AVERAGE TIME FROM ONSET OF SYMPTOMS TILL DIAGNOSIS

In this study the average time from the onset of symptoms till diagnosis was 12 months ± 5 months. This delay in diagnosis was found to be due to misdiagnosis, referral process and other reasons that included lack of finances and distance to the referral center. In 82% of the cases the diagnosis of JIA was made by the rheumatologist in the tertiary referral center.

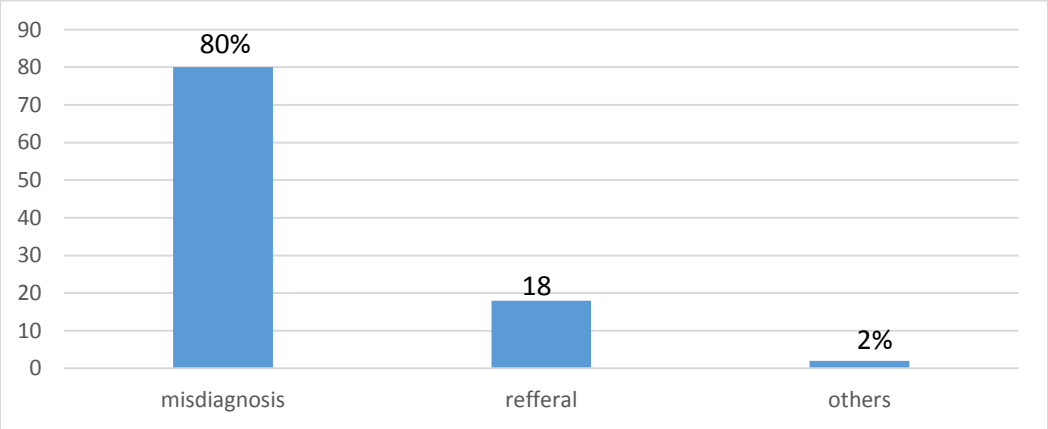


FIGURE 2: REASONS FOR DELAY IN DIAGNOSIS

CLINICAL OUTCOMES

Disease activity was determined by joint swelling or pain with limitation of joint movements. In addition systemic JIA disease activity was determined by presence of evanescent rash, lymphadenopathy, hepatosplenomegally, serositis or fever. Eighty percent of the study population still had continued disease activity despite treatment as seen in figure 4 below.

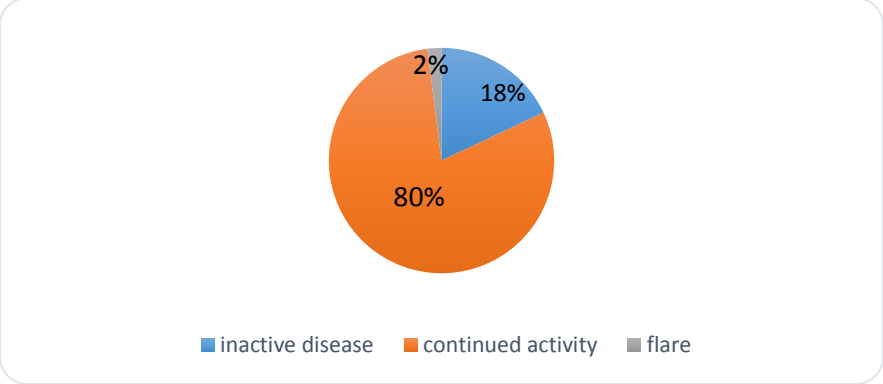


FIGURE 3 : DISEASE ACTIVITY.

ARTICULAR DAMAGE

JIA articular damage scoring index (JADI) is considered significant if the patient scores >0. 48% of the patients seen had articular damage. Most of the patients with the articular damage were female 91%. As seen in the table 3 below.

TABLE 3: ASSOCIATION OF GENDER AND JUVENILE ARTHRITIS ARTICULAR DAMAGE.

SEX	N(24)	%
Male	2	8.3%
Female	22	91.7%

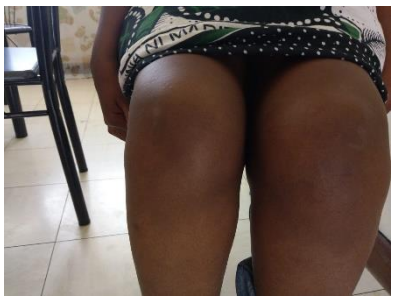
The pattern of articular damage observed was as seen in table 4 below.The joints that were most damaged were the elbow, wrist, metacarpal phalangeal joint and the knee joint

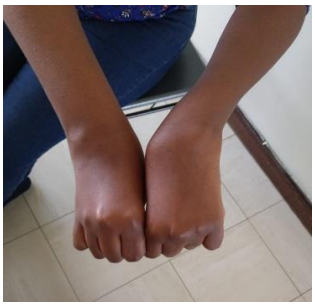
TABLE 4: JUVENILE ARTHRITIS DAMAGE INDEX (ARTICULAR DAMAGE)

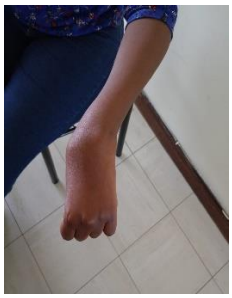
JOINT INVOLVED			N (50)	%
Temporo mandibular joint	Micrognathia or maligned teeth arcades		1	2%
Cervical spine	extension < 50% of normal range Or cervical sublaxation		5	10%
Elbow	flexion contracture < 30°	right left	10 10	20% 20%
Wrist	extension or flexion < 50% of range ulnar or radial deviation	right left	10 8	20% 16%
Metacarpal phalangeal joint	Flexion contracture, ulnar or radial deviation	Right left	8 4	16% 8%

Proximal interphalangeal joint	Flexion contractute	Right left	4 3	8% 6%
Hip	Internal rotation <10°	Right left	2 3	4% 6%
Knee	Valgus deviation >15° due to arthritis or flexion contracture <25°	Right left	7 8	14% 16%
Ankle	Flexible valgus deformity <20°	Right left	5 4	10% 8%
Metatarsal phalangeal joint	Visible deformity due to arthritis	Right left	5 6	10% 12%

Image 1 **Image 2** **Image 3**







The above images were taken from a sixteen year old girl with polyarticuar JIA. Image 1 shows a swollen left ankle indicating active disease while image 2 and 3 show wrist deformity with ulnar deviation of the left hand.

EXTRA ARTICULAR DAMAGE

JIA extra articular damage pattern observed was as seen in table 5 below.

TABLE 5: JIA EXTRA ARTICULAR MANIFESTATIONS.

Extra articular manifestation	**N(50)**	**%**
Striae rubrae	3	6%
Muscle atrophy	1	2%
Subcutaneous atrophy due to intra articular steroid injection	2	4%
Significant limb length difference	2	4%

Uveitis was also observed in one patient out of 17 (34%) patients that were screened for uveitis. Of note is that most of the patients with JIA had not been screened for uveitis 33(66%).

TABLE 6: LABORATORY INVESTIGATIONS

The laboratory investigations done are seen in the table below. Of note is that some of the lab investigations were not available on the patient's records. The tests were not available on the records primarily due to the cost implication on the patients.

INVESTIGATION	**RESULT**	**N (50)**
Antinuclear antibody	Positive	1
	Negative	25
	Not available	24
Rheumatoid factor	Positive	2
	Negative	18
	Not available	30
HLA B27	Not done	50

TREATMENT MODALITIES

Out of the 50 children recruited in the study the most common treatment modality used in treating JIA was methotrexate at 68% followed by NSAIDS at 60%.

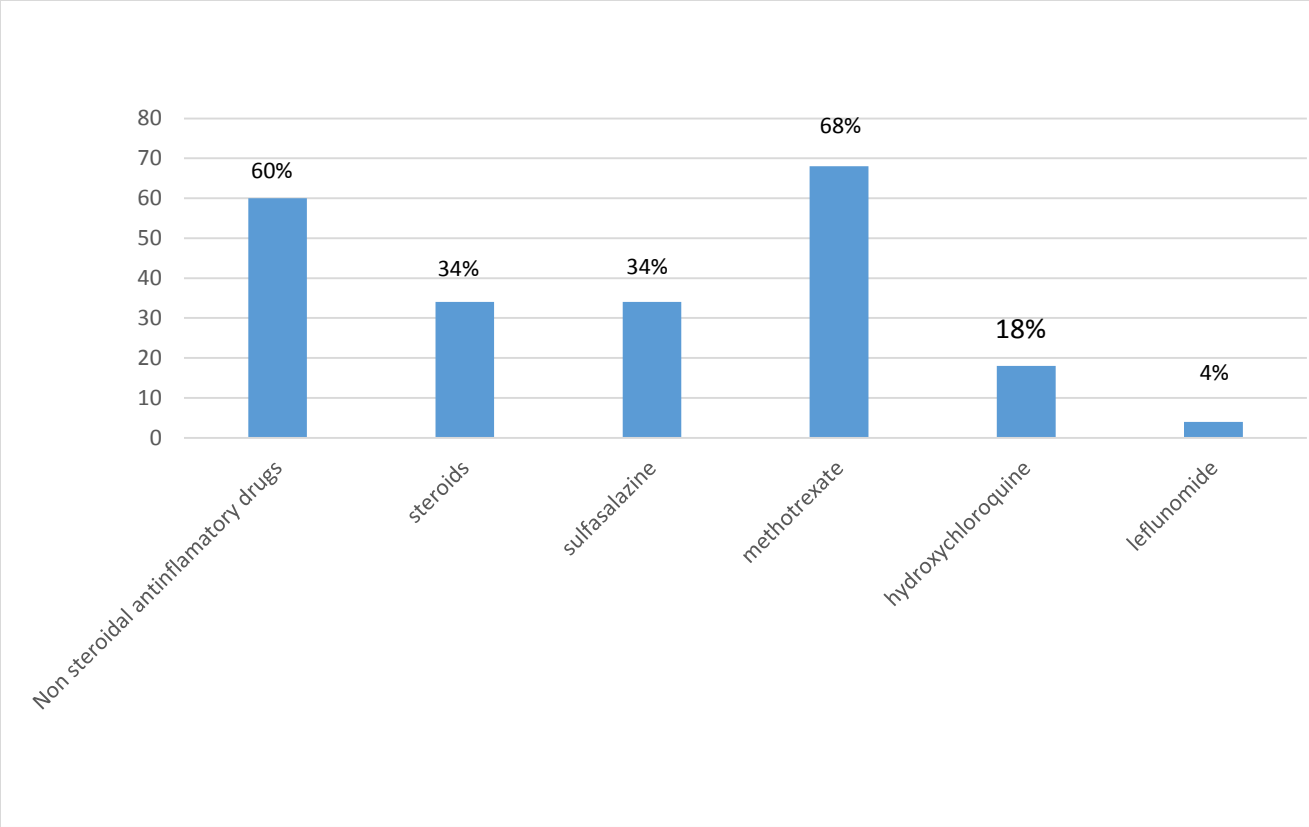


FIGURE 4: JIA TREATMENT MODALITIES

11.0 DISCUSSION

This study set out to determine the distribution of the various sub types of JIA, the clinical outcomes as well as the treatment modalities of JIA as seen in Kenyatta National Hospital among 50 patients who attended the pediatric rheumatology clinic. The study was conducted over a period of 4 months. This is one of the first studies in this area in our region. Out of the 50 patients, 20 had polyarticular subtype at (40%) which was the commonest subtype while 14 patients had the ERA subtype (28%). This finding is similar to the findings of other studies conducted in South Africa. Weakly K et al conducted a study in two tertiary centers in Cape town and found that 32 out of the 78 patients recruited into the study had polyarticular JIA 41% while 18 patients had ERA 23%.(34) The male to female ratio was 1: 2 in our study which is similar to another study done in France where out of the 67 patients with JIA recruited into their study, the male to female ratio was 1:2 (35). However the South African study by Weakly. K etal found the male to female ratio to be equal (34).The mean age in the study population was 11 years ± 5.

In the laboratory investigations ANA was not available in all the patients' records because the patients were unable to afford the cost of doing the test. The Rheumatoid factor test was not done on all the patients with polyarticular JIA therefore we were unable to categorize all the patients as RF positive or negative. This was also due to the additional cost of doing the test. HLA B27 was not done on the patients with ERA this is because the test is unavailable in KNH and it is an expensive test if done in other private labs outside KNH.

Majority of the patients 68% were on methotrexate and 30 were on NSAIDS 60% . This is because it is one of the available DMARDS available in KNH. None of the patients were on biologics for treatment of JIA. This finding was similar to another multinational study EPOCA that found that biologics were administered less frequently in Asia where 17% of the JIA patients received biologics compared to America where 54% of the JIA patients received biologics.(7)

The average time from onset of first symptoms until diagnosis was 12 months ± 5. This indicates delay in diagnosis. This finding can be compared to a similar study done on France. The study was a retrospective study. Sixty seven patients were recruited into the study from a tertiary center in France. The average time of diagnosis from onset of symptoms was 3 months (35). In our study, the cause in delay of diagnosis was: misdiagnosis in 40 of patients, referral process in 8 patients and other reasons in 2 of the patients. Other reasons included lack of finances to seek medical help and distance to the referral center. The diagnosis of JIA was made in 82% of the cases by the rheumatologist at the tertiary referral center.

The clinical outcomes observed were 80% of the patents enrolled into the study still had active disease despite them being on treatment. 2% of the patients had a flare of the disease while 18% of the patients had inactive disease. Disease activity was determined by the presence of joint swelling, pain or limitation of movement. While in systemic JIA active disease was determined by the presence of systemic features. This finding is similar to what Consolaro A etal found in the multinational EPOCA study 84% of the patients from the African continent had active disease. (7) This could be due to the duration of treatment or the modality of treatment the patients are on. (33)

Damage caused by JIA was divided into articular and extra articular damage. Twenty four (48%) patients had articular damage. This finding was slightly different compared to a similar study done in Italy Solari N etal found 34% of patients in his study had articular damage (9). In our study, among those with articular damage 22 (91%) were female while 2(8%) were male. The joints found to be commonly affected by JIA were the elbow joint, wrist and the knee joint.

Extra articular damage was also observed in 16% of the patients with JIA. The extraricular damage observed were striae rubrae at 6% limb length difference 4%, and subcutaneous atrophy at 4%. One patient with polyarticular JIA was found to have uveitis. However only 17 (34%) patients out of the 50 had had screening for anterior uveitis done on them. Uveitis can cause lifelong complications which include lifelong medication, eye surgeries and loss of vision which in the long run impairs the quality of life (20).

The American Academy of Pediatrics guidelines recommend that patients with oligo articular, polyarticular RF negative and ANA positive JIA below the age of 7 years who have had JIA for< 4years get 3- 4 monthly screening for uveitis because they have a higher risk for developing uveitis.(28) This guidelines have however not been implemented in our set up.

STRENGTHS

1. The study was conducted in the pediatric rheumatology clinic which runs on Thursday afternoon concurrently with the adult rheumatology clinic. Therefore participants in the study were recruited from both clinics.

LIMITATIONS

1. The classification of disease subtype was mainly clinical since some lab investigations were unavailable such as HLA B27 and other lab investigations were not done by the patients because of the cost.

12.0 CONCLUSION, RECCOMENDATTIONS

CONCLUSION

The most common sub types of JIA found were polyarticular and ERA this finding was similar to what other studies from Nigeria and South Africa found. We also found that there is need to closely follow up these children with JIA because 80% of them had active disease despite treatment. Finally, early referral and diagnosis of JIA needs to be done so that early appropriate treatment can be instituted so that the complications associated with JIA can be avoided.

RECOMMENDATIONS

1. Health workers should be taught how to recognize JIA early for prompt institution of appropriate treatment.
2. Clinicians should be taught on the importance of screening for anterior uveitis early on all JIA patients.

13.0 REFERENCES

1. Lakshmi N, Margaret G, Hasnett A, Lehman T. Burden of childhood onset arthritis. Pediatric rheumatol. 2010; 8: 20.

2. Okongo L, Christian S. The spectrum of pediatric rheumatic diseases in two tertiary centers in Cape Town South Africa. Ped rheumatol. 2014; 12(1):155.

3. Menon N, Pethumbaran G, Puthiyapurayil A, Numbdakath C, Arukaral R. Clinical profile and JADI in children with juvenile idiopathic arthritis: a study from a tertiary center in South India. Int J Rheum Dis. 2016; 15: 27.

4. Prahalad S, Giass D. A comprehensive review of genetics in Juvenile idiopathic arthritis. Pediatric rheumatol online J. 2008; 6: 11

5. Sampath P, Obrien E, Fraser A, Kerber R, Mineau G, Putt D, et al. Familial aggregation of JIA. Arthritis rheumatol J. 2004; 12:4022- 4027.

6. Kilegman R, Stanton B, St Geme J, Schor N. Nelsons textbook of pediatrics 20th ed. Philadelphia: Elsevier; 2016: 1160.

7. Consolaro A, Dolezalova P, Panaviene V, Eastman A, Merino R, Constantin T, et al. A multinational study on epidemiology, treatment and outcome of childhood arthritis. Ped Rheum.2014; 12 (1):08.

8. Lorenzo C, Fernanda F, Ginerva C, Serena C, Murlo M. Safety and efficacy of biolofical therapy with TNF inhibitors and non TNF inhibitors : A cohort study of young adults affected by JIA. Pediatric Rheumatol online J. 2011; 9: 273.

9. Solari N, Viola S, Pistorio A, Magni manzoni S, Vitale R, Ruperto N, et al. Assesing the current outcomes of JIA: a cross sectional study in a tertiary center sample. Arthritis rheum. 2008; 59 (10): 1379- 84.

10. Marivillet L, Terada C, Quartier P, Bodghi P, Prieur A, Buiqock E. Occular threat in JIA: pediatric rheumatol online J. 2008; 6 (1): 83.

11. Arguedas O, Fasth A, Anderson B, Porass O. Juvenile chronic arthritis in urban San Jose: A 2 year prospective study. J Rheumatol.2014; 29(1): 379-83.

12. Sullivan D, Cassidy J, Petty R. Pathogenic implications of age of onset in JRA. Arthritis rheumatol J. 1975;18 (3): 251-255.

13. Schaller J. Juvenile rheumatoid arthritis series. Arthritis rhematol J. 1977; 20 (2) 165-70.

14. Ombrello M, Remmers E, Tachmazidou L, Grom A, Foell D, Hass T, et al. HLA DRB1 and variants of MHC class 2 locus are stronger risk factors for systemic JIA. PHAS.2015; 112(52): 15970- 15975.

15. Silverman E, Isacovics B, Petesche D, Laxer M. Synovial fluid cells in JIA : evidence of selective T- cell migration into inflamed tissue: clinical and experim immuno J. 1993 jan; 91(1); 90-95.

16. Oen K, Postl B, Fast M. Epidemiology of JIA in Manitoba Canada 1975- 92: cycle in incidence. J of rheumatol. 1995; 22(4): 745-50.

17. Ogra PL, Chiba Y, Ogra SS, Dzierba J, Herd J. Rubella virus infection in JIA. Lancet. 1975; 1(7917): 1157-61.

18. Horton D, Scott F, Haynes K, Putt M, Rose L, Lewis J, et al. Antibiotic exposure and Juvenile idiopathic Arthritis: A case control study. AAP journal.2015;136(2):334-341.

19. Cassidy JT. Juvenile rheumatoid arthritis. In: Textbook of Rheumatology 6th ed. Kelly et al. Elsevier 2000:214.

20. Leila L, Cervantes R, Androud S, Reed G, Foster S. Visual outcomes in children with JIA associated uveitis. American opthalmo J. 2005; 21 (2): 70-72.

21. Shin Y, Chol J, Nahm D, Park H, Suh C et al. Rheumatoid factor is a marker of disease severity in Korean rheumatoid arthritis. Yonesi med J.2005;46: 464-470.

22. Kuna A, Lumot L, Miller M, Harjacek M, Simundic A, Vrikic N etal. Antibodies to mutated citrulinated vimetin and antibodies to CCP in JIA. Clinchem lab med.2009; 47: 1525-1530.

23. Kihwan K, Dong S. JIA diagnosis and differential diagnosis. Korean J Pediatr. 2010; 53(11): 931-935.

24. Lamer S, Sehag G. MRI and ultrasound in children with JIA. Eur J Radiol. 2000; 33: 85-93.

25. Duffy C. Health outcomes in pediatric rheumatic disease. Curr opin Rheumatol. 2004 Mar: 16 (2): 102-8.

26. Sabri K, Sauren mann. R, Silverman E, Leivan A. Course complications and outcomes of JIA related uveitis. AAPOS. 2008; 12 (6): 539-45.

27. Skarin A, Elbourgh R, Eland E, Bengtson E. Long term follow up of patients with uveitis associated with JIA: a cohort study. Occular immunol inflammation.2009; 17 (2): 104-8.

28. Angeles s, Maccraken C, Yeh S, Jenkin K, Stryker D, Volger L, et al. Characteristics of a cohort of children with JIA associated uveitis. Pediatric rheumatol. 2015; 13: 19.

29. Lelieveid O, Armburst W, Leeuwen V, Duppen N, Geerfzen J, Vanweert E. Physical activity in adolescents with JIA. Arthritis rheum. 2008; 59(10): 1379-84.

30. Muller E, Lehman H, Kuster R, Thyen U. Quality of life and psychosocial adaptation in children and adolescents with JIA and reactive arthritis. Z rheumatol. 2005; 64 (3): 177-87.

31. Petersen C, Nordenyers S, Muller E, Foeldrari I, Kuster R, Bullinger M. Health related quality of life in children and adolescents with JIA. Klin podiatry. 2008; 220(4) : 259-65.

32. Taana A, Corrente J, Magalanaes C. Remission status follow up in children with JIA. J pediatr.2007;83(2): 141-148.

33. Consolaro A, Giancane G, Schiappapitera B, Serigo D, Calandra S, Lanni S, et al. Clinical outcome measures in Juvenile idiopathic arthritis. Pediatr Rheumatol Online J .2016. DOI 10.1007/54 0744-016-0040-4.

34. Weakley K, Esser M, Scott C. Juvenile idiopathic arthritis in two tertiary centers in the Western Cape, South Africa. Pediatr Rheumatol Online J. 2012;10(1):35.

35. Aoust L, Semerano L, Kone I, Dusser P. Time to diagnosis in JIA a French perspective. Orphanet J rare dis. 2017;12: 43.

36. Migowa A, Colmegna I, Hitchon C, Were E, Ng'ang'a E, Ngwiri T, et al. The spectrum of rheumatic in-patient diagnoses at a pediatric hospital in Kenya. Pediatr Rheumatol Online J. 2017;15(1):4.

37. Olaosebikan H, Adelowa O, Animashaun B, Akintayo R. Spectrum of paediatric rheumatic disease in Nigeria. Pediatr Rheumatol Online J. 2017; 15: 7.

14.0 APPENDICES

14.1: CONSENT DOCUMENT AND FORM

Consent information document in English

Date:

Study title

Pattern and treatment outcomes of JIA in Kenyatta national hospital

Introduction

I am a postgraduate student at the University of Nairobi perusing a degree in Masters of Medicine in Pediatrics and Child health. I wish to request for your permission to enroll your child in a study that will be a part of my degree work. The study will involve my requesting you to allow me to examine your child with JIA and obtain further information from your child's records/ file. The information obtained will be recorded and analyzed for research purposes only

Purpose of the study

To determine the treatment and outcome for children diagnosed with JIA between the ages of 1-18 years managed at the KNH rheumatology clinic. In order to improve knowledge on the management of children with JIA.

Investigator: Dr. M. Kamau

Pediatric resident UON,

P.O.Box 70390-00400 Nairobi

Mobile: 0725149619

Lead supervisor: Dr Owino. L

Consultant pediatric rheumatologist

P.O.Box……

Mobile:

KNH UON ERC SECRETARIAT,

Telephone: 27263000 Ext 44355,

KNH,

Nairobi.

Background

JIA is a chronic disease that causes disability as well as other systemic complications like compromised vision due to uveitis. Early recognition and treatment of the disease is required to prevent any further morbidity and mortality.

Study procedure

Children aged 1- 18 years will be included in the study. The enrolled patients will be from KNH rheumatology clinic. After obtaining informed consent the children will undergo a focused clinical examination and their medical records will be assessed. Further investigations may be requested if deemed necessary. The data will be filled in the questionnaire.

Benefits

The study will allow us to assess the point of delay in making a diagnosis of JIA. The current management and outcomes will also be assessed. The results of the study will be used by health care providers to help improve the care of children with JIA.

Risks

There will be no risks anticipated to your child during the study. No invasive procedures will be carried out on your child during the study.

Voluntariness

This study will be voluntary. There will be no financial rewards given to your child for participating in the study. One is free to participate or withdraw from the study at any point. Refusal to participate in the study will not affect the management of your child in any way.

Confidentiality

The information obtained about your child will be kept in strict confidence. No specific information regarding your child will be released to any person without your written permission. We will, however, discuss general overall findings regarding all children assessed but nothing specific will be discussed regarding your child's condition. Your child's study identity number will not be revealed to anyone.

Problems or questions

If you ever have any questions about the study or about the use of the results you can contact the principal investigator, Dr. Kamau mercy 0725149619

If you have any questions on your rights as a research participant you can contact the Kenyatta National Hospital Ethics and Research Committee by calling 2726300 extension 44355.

GUARDIANS CONSENT FORM

Date

Study title: pattern and treatment outcomes for JIA

Lead investigator: Dr Mercy Kamau

Pediatric resident, university of Nairobi

P. O. Box 70390-0400 Nairobi.

Mobile: 0725149619.

Lead supervisor: Dr Owino Lawrence

Consultant pediatric rheumatologist, University of Nairobi.

P. O. Box

Mobile:

KNH- UON ERC secretariat Telephone: 2726300 extension 44355.

Kenyatta National hospital,

Nairobi.

I _____having received adequate information regarding the study research, benefits and risks hereby AGREE / DISAGREE (Cross out the appropriate) to participate in the study with my child. I understand that our participation is fully voluntary and that I am free to withdraw at any time. I have been given adequate opportunity to ask questions and seek clarification on the study and these have been addressed satisfactorily.

Parents/Guardian's Signature: _____Date_____

I _____ declare that I have adequately explained to the above participant; the study procedure, benefits and risks and given him /her time to ask questions and seek clarification regarding the study. I have answered all the questions raised to the best of my ability.

Investigator's Signature_____Date_____

FOMU LA KUTOA IDHINI YA KUSHIRIKI KATIKA UTAFITI

Tarehe_____

Kichwa cha Utafiti:

Mtafiti Mkuu: Daktari Mercy Kamau

Mwanafunzi wa shahada kuu ya matibabu maalum ya watoto, Chuo Kikuu cha Nairobi.

Nambari ya posta: 70390-0400 Nairobi.

Simu: 0725149619

Msimamizi Mkuu: Daktari Owino.L

Matibabu ya watoto, Chuo Kikuu cha Nairobi.

Nambari ya Posta:

Simu

KNH-UON ERC Secretariat- Simu: 2726300 extension 44355

Nairobi.

Mimi_____kuwa nime pokea habari kuhusu utafiti huu, faida na athari kukubaliana/ kukataza (kata jibu sahihi) kushiriki kwa utafiti huu. Naelewa kushiriki ni kikamilifu hiari na naweza kujiondoa saa yoyote. Nimepatiwa mda wa kutosha kuuliza maswali na kupata ufafanuzi kwa utafiti huu na hizi zote zime shugulikiwa.

Sahihi ya mzazi/mlezi_____ Tarehe_____

Minor Assent Document

Project Title: Pattern and treatment outcomes of JIA

Lead investigator: Dr Mercy Kamau,
Pediatric resident, university of Nairobi,
P. O. Box 70390-0400 Nairobi.
Mobile: 0725149619.

Lead supervisor: Dr Owino Lawrence,
Consultant pediatric rheumatologist, University of Nairobi.
P. O. Box
Mobile:

We are doing a research study about juvenile arthritis and how it affects the children who have it in the long term as well as the types of treatment they are receiving.
Permission has been granted to undertake this study by the Kenyatta National Hospital-University of Nairobi Ethics and Research Committee (KNH-UoN ERC Protocol No. _____)
This research study is a way to learn more about people. At least 50 children will be participating in this research study with you.
If you decide that you want to be part of this study, you will be asked to let us examine you as well as get more information on the disease from the file. If an eye test has not been done you will be sent to another clinic where the test will be done.
There are some things about this study you should know. These are the physical examination may be uncomfortable and tedious.
Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. We think these benefits might be to help other children with this disease in the future to be managed better.

When we are finished with this study we will write a report about what was learned. This report will not include your name or that you were in the study.

You do not have to be in this study if you do not want to be. If you decide to stop after we begin, that's okay too. Your parents know about the study too.

If you decide you want to be in this study, please sign your name.
I, _____, want to be in this research study.

_____ _____
Signature/ thumb stamp Date

FOMU LA WATOTO LA KUTOA IDHINI YA KUSHIRIKI KATIKA UTAFITI

Tarehe_____

Kichwa cha Utafiti: Aina mbalimbali na matokeo ya matibabu ya ugonjwa wa viungo Unaoadhiri watoto katika hospitali kuu ya Kenyatta.

Mtafiti Mkuu: Daktari Mercy Kamau,
Mwanafunzi wa shahada kuu ya matibabu maalum ya watoto, Chuo Kikuu cha Nairobi.
Nambari ya posta: 70390-0400 Nairobi.
Simu: 0725149619.

Msimamizi Mkuu: Daktari Owino.L
Matibabu ya watoto, Chuo Kikuu cha Nairobi.
Nambari ya Posta:
Simu

Tunafanya utafiti kuhusu ugonjwa wa viungo unavyoadhiri watoto na matibabu ambayo wanapata kupinga ugonjwa huu.

Tumepata ruhusa kutoka kamiti ya Chuo kiuu cha Nairobi pamoja na Hosiptali Kuu ya Kenyatta inayo husishwa na utafiti.

Huu utafiti utatusaidia kujua zaidi kuhusu watu walioadhiriwa na huu ugonjwa. kunao watoto wengine hamsini watakaokuwa katika huu utafiti pamoja na wewe

Ukiamua unataka kuwa katika huu utafiti, tutakuuliza uturuhusu tukuangalie mwili wako na tuangalie faili yako ili tupate maelezo zaidi kuhusu ugonjwa wako. Kama hujawahi angaliwa macho na daktari wa macho pia tutakutuma kwake ili uanagaliwe macho.

Kuna mambo kuhusu utafiti huu unafaa kuelewa. Shughuli ambazo tutazifanya zinaweza kuwa za kuchosha.

Sio kila mtu atapata faida kutokana na utafiti huu. Faida maana yake ni kitu kizuri kikikutendekea wewe. Fdaida itakuwepo ya kusaidia watoto wengine katika siku zijazo watakaosaidika kwa kutibiwa vyema zaidi kupitia matokeo ya utafiti huu.

Tukmaliza huu utafiti, tutaandika repoti ya kueleza matokeo tuliyopata. Kaika hii repoti jina lako halitatajwa wala hatutasema ulihusika katika huu utafiti.

Sio lazima uwe katika huu utafiti kama hautaki. Ukiamua baaadaye hutaki kuwa katika uafiti huu pia ni sawa. Wazazi wako wanajua kuhusu huu utafiti pia.
Ukiamua unataka kuwa katika huu utafiti andika jina lako hapa.
Mimi _____, nataka kuwa katika huu utafiti.

_____ _____

Sahihi/ alama ya kidole Tarehe

14.2: QUESTIONAIRE

DATE

PATIENT INFORMATION

1. patients initials
2. sex: Male Female
3. Age:
4. area of residence:
5. family socio economic status: Low Average High
6. Date of onset of disease

   (date of occurrence of first clinical manifestation of the disease)
7. JIA subtype
8. Date of diagnosis

   If difference in date of disease onset till diagnosis is >6 months
9. reason for the delay in diagnosis

   ☐ Referral process

   ☐ Misdiagnosis

ILAR CATEGORY OF JIA

☐ **SYSTEMIC ARTHRITIS**

classification criteria

Arthritis in <1 joint ☐

preceded by a quotian fever for the past 2 weeks for at least 3 days duration ☐

accompanied by:

evanescent rash ☐

generalized lymphadenopathy ☐

hepato/splenomegaly ☐

serositis ☐

exclusion criteria(all must be answered no for classification to be right)

1. Psoriasis/ history of psoriasis in 1st degree relative: Yes No N/A
2. Arthritis HLAB27 positive boy beginning after 6th birthday: Yes No N/A
3. presence of IgM rheumatoid factor on 2 occasions 3 month apart: Yes No N/A
4. Ankylosing spondylitis, enthesitis related arthritis (ERA), inflammatory bowel disease, uveitis and history of above in first degree relative Yes NO N/A

☐ OLIGOARTICULAR ARTHRITIS

classification criteria

Arthritis affecting 1- 4 joints during the first 6 months of disease

exclusion criteria(all must be answered no for classification to be right)

1. Psoriasis/ history of psoriasis in 1st degree relative: Yes No N/A
2. Arthritis HLAB27 positive boy beginning after 6th birthday: Yes No N/A
3. presence of IgM rheumatoid factor on 2 occasions 3 month apart: Yes No N/A
4. Ankylosing spondylitis, enthesitis related arthritis (ERA), inflammatory bowel disease, uveitis and history of above in first degree relative Yes NO N/A
5. presence of systemic JIA Yes No N/A

☐ **POLYARTICULAR ARTHRITIS (RF negative)**

classification criteria

Arthritis affecting >5 joints during the first six months of disease

RF test negative

exclusion criteria(all must be answered no for classification to be right)

1. Psoriasis/ history of psoriasis in 1st degree relative: Yes No N/A
2. Arthritis HLAB27 positive boy beginning after 6th birthday: Yes No N/A
3. presence of IgM rheumatoid factor on 2 occasions 3 month apart: Yes No N/A
4. Ankylosing spondylitis, enthesitis related arthritis (ERA), inflammatory bowel disease, uveitis and history of above in first degree relative Yes NO N/A
5. presence of systemic JIA Yes No N/A

☐ **POLYARTICLAR ARTHRITIS (RF POSITIVE)**

classification criteria

Arthritis in > 5 joints during the first 6 months of diseases ☐

two RF positive tests 3 months apart positive during the first six months of disease ☐

exclusion criteria(all must be answered no for classification to be right)

1. Psoriasis/ history of psoriasis in 1st degree relative: Yes No N/A
2. Arthritis HLAB27 positive boy beginning after 6th birthday: Yes No N/A
3. Ankylosing spondylitis, enthesitis related arthritis (ERA), inflammatory bowel disease, uveitis and history of above in first degree relative Yes NO N/A
4. presence of systemic JIA Yes No N/A

☐ **PSORIATIC ARTHRITIS**

classification criteria

Arthritis☐ and psoriasis ☐

with at least 2 of the following:

dactylitis ☐

nail pitting ☐

psoriasis in first degree relative ☐

exclusion criteria(all must be answered no for classification to be right)

1. Arthritis HLAB27 positive boy beginning after 6th birthday: Yes No N/A
2. presence of IgM rheumatoid factor on 2 occasions 3 month apart: Yes No N/A
3. Ankylosing spondylitis, enthesitis related arthritis (ERA), inflammatory bowel disease, uveitis and history of above in first degree relative Yes NO N/A
4. presence of systemic JIA Yes No N/A

☐ **ENTHESITIS RELATED ARTHRITIS**

classification criteria

Arthritis and enthesitis ☐

Arthritis ☐ Enthesitis ☐

two of the following:

sacroiliac joint tenderness ☐

HLAB27 antigen ☐

onset of arthritis in a boy >6 years ☐

acute symptomatic anterior uveitis ☐

history of ankylosing spondylitis, ERA, inflammatory bowel disease and acute anterior Uveitis in a 1st degree relative ☐

exclusion criteria(all must be answered no for classification to be right)

1. Psoriasis/ history of psoriasis in 1st degree relative: Yes No N/A
2. presence of IgM rheumatoid factor on 2 occasions 3 month apart: Yes No N/A
3. presence of systemic JIA Yes No N/A

☐ **UNDIFFERENTIATED ARTHITIS**

Classification criteria

arthritis that fulfills criteria in no category

or

arthritis that fulfills criteria in 2 or more of the above categories

LABORATORY AND ADDITIONAL CLINICAL INFORMATION

Anti-nuclear antibodies(ANA)

Date of first determination

Date of second determination

rheumatoid factor (RF) per ILAR criteria 3 months apart

Date of first determination

Date of second determination

HLA B27 determination positive☐ negative ☐ unknown ☐

Uveitis history yes ☐ no ☐ unknown ☐

Macrophage activating syndrome (MAS) yes☐ no ☐ unknown ☐

Other comorbidities yes ☐ no ☐ unknown ☐

If yes which comorbidity?

Family history of autoimmune disease yes ☐ no ☐ unknown ☐

If yes list the relationship to the subject and the disease

Relationship to subject _____ disease

RHEUMATOLOGY EXAM

LM (limitation of motion)

LM	pain	swelling	JOINT	LM	pain	swelling
			Toe 5			
			Toe 4			
			Toe 3			
			Toe 2			
			Toe 1			
			MTP joints			
			Subtalar joints			
			Intertarsal joints			
			ankle			
			knee			
			hip			
			DIP joints			
			PIP joints			
			MCP joints			
			wrist			
			elbow			
			shoulder			
			Acromion clavicular			
			Sterno clavicular			
			Cervical spine			
			Thoracic spine			
			Lumbar spine			
			Sacroiliac joints			

Physician global assessment of overall disease activity

consider all the signs and symptoms and rate the overall disease activity at the present visit

NO activity

0

1

2

3

4

5

6

7

8

9

10

maximum activity

DISEASE STATUS ASSESMENT

disease activity during the current visit

inactive disease continued activity flare

disease course from the last visit assessment

improved slightly improved unchanged slightly worse

Much worse

Presence of active uveitis yes no N/A

Presence of active systemic features yes no

dactililytis present (swelling of one or more joints) yes ☐ no ☐

N/A ☐

Presence of enthesitis

(Tenderness at the insertion of a ligament or tendon on bone) yes ☐ no ☐ N/A ☐

Presence of morning stiffness > 15 minutes yes NO N/A

Acute phase reactant values if available

CRP _____ ESR

DRUG THERAPY

drug	**Past prescription**	**Current drug**	**Drug to be continued**	**Drug discontinued**
NSAIDS				
Steroids				
• oral				
• intravenous				
• Intra articular				
methotrexate				
• oral				
• subcutaneous				
• Intra muscular				
Biological agents				
specify				

JUVENILE ARTHRITIS DAMAGE INDEX (JADI)

Extra articular damage

Ocular

Item	**absent**	**present**
Cataract and or uveitis (ocular surgery-2, blindness-3)		
Right eye	0	1,2,3
Left eye	0	1,2,3

Musculoskeletal (non articular)

	ABSENT	**PRESENT**
Severe muscle atrophy	0	1
Osteoporosis, fractures, vertebral collapse	0	1
Avascular bone necrosis	0	1
Vertebral curve abnormality due to limb length discrepancy	0	1
Significant limb length difference	0	1

CUTANEOUS

Striate rubrae	0	1
Subcutaneous atrophy due to intraarticular injection of steroids	0	1

ENDOCRINE

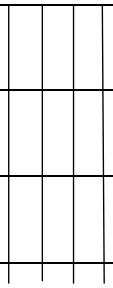
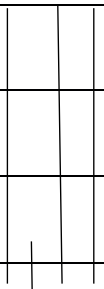
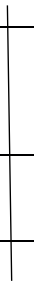
Growth failure	0	1
Pubertal delay	0	1
Diabetes mellitus	0	1
Total score (max 17)		

JUVENILE ARTHRITIS DAMAGE INDEX (JADI)

Articular damage

Joint type	**Definition of articular damage**	**score**
Temporo mandibular	normal no relevant damage	**0**
	Micrognathia or malaligned teeth arcades	**1**
	severe restriction of mouth opening not allowing three superimposed fingers to enter into the mouth	**2**
Cervical spine	normal or no relevant damage	**0**
	Extension <50% of the cervical spine, cervical subluxation	**1**
	Ankylosis, medullary compression or surgical fusion	**2**

JUVENILLE ARTHRITIS DAMAGE INDEX (JADI) ARTICULAR DAMAGE

Joint type	**Definition of articular damage**		
		right	**left**
shoulder	Normal or no relevant damage	**0**	**0**
	External rotation <50% and abduction <180	**1**	**1**
	ankylosis or prosthesis	**2**	**2**
elbow	Normal or not relevant	**0**	**0**
	Flexion contracture <30	**1**	**1**
	Flexion contracture >30 ankylosis or prosthesis	**2**	**2**
wrist	Normal or not relevant	**0**	**0**
	Extension or flexion <50% of normal range, ulnar or radial deviation	**1**	**1**
	Ankylosis or prosthesis	**2**	**2**
	fingers	**I II III IV V**	**I II III IV V**
Metacarpo phalangeal	Normal or no relevant damage 0		
	Flexion contracture, ulnar and radial deviation 1		
	Subluxation, ankylosis or prosthesis 2		
Proximal interphalangeal	Normal or no relevant damage 0		
	Flexion contracture 1		
	Swan neck or ankylosing deformities 2		
hip	Normal or no relevant damage	**0**	**0**
	Internal rotation <10	**1**	**1**
	Ankylosis or prosthesis	**2**	**2**
knee	Normal or no relevant damage	**0**	**0**
	Valgus deviation >15 or flexion contracture <25	**1**	**1**
	Flexion contracture >25 or prosthesis	**2**	**2**
ankle	Normal or no relevant damage	**0**	**0**

	Fixed Valgus deformity < 20	**1**	**1**
	Fixed valgus deformity >20 ankylosis or prosthesis	**2**	**2**
Metatarso phalangeal	Normal or relevant damage	**0**	**0**
	Visible deformity due to arthritis	**1**	**1**
	Fore foot arthroplasty	**2**	**2**
	Total score(max 72)		