



Diagnostic Approaches and Management of Juvenile Rheumatoid Arthritis: Past Challenges v/s Current Advancement

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ABSTRACT

Juvenile rheumatoid arthritis is a single term signifying many disease state of rheumatology, despite having prominent disease appearance and identifying features, gets unnoticed until become chronic or severe in simple words. As its being manifested in pediatric population, become challenging for on time address and basic care. We are here to address all those past challenges, present scenarios and current advancement in field. This disease is not having any single or accurate root cause to address or deal with, as mostly idiopathic, sometimes immune related or remains unknown. So this review provides an overview of our workup in gathering all the relevant informations datas and all about diagnostic approach, treatment and management plans. All these information would be based on disease significance in Kyrgyzstan, India and worldwide data comparisons along with past issue redressals .

Keywords: Juvenile rheumatoid arthritis; pediatric arthritis; Young age Arthritis; chronic arthritis; Juvenile idiopathic arthritis; childhood arthritis.

Introduction

Juvenile Rheumatoid Arthritis (JRA) is a type of arthritis affecting the pediatric population. Any individual getting affected with arthritis under the age of 16 or younger is considered as Juvenile manifestation of Rheumatoid Arthritis.

Arthritis is inflammation (swelling), stiffness of joints which may leads to deformity. It can affect any joint of the body, can affect one or more joints at a time. As its rheumatoid arthritis it would be associated with muscle spasm, muscle wasting and less chances of cardiac involvement (<10%) pericardial effusion is also rarely seen, usually positive for RA Factor and chronic course. The joint deformity and residual defects present in joints. There is two type of deformities associated with JRA are Swan neck deformity and Boutonnieres deformity.

Epidemiology

varies globally, with an estimated incidence of 1-23 cases per 100,000 children

In India, the prevalence of juvenile idiopathic arthritis was estimated to be around 0.07–4.01 per 1,000 children in various studies

In Kyrgyzstan, data on JRA might be limited, as rheumatological conditions in children may not be extensively documented as per records and data found in osh infectious disease hospital osh city Kyrgyzstan; they confirmed and mentioned they didn't find any boom in JRA cases but senior doctors have attended afew cases which is under the WHO estimate of 1 or less in 1000.

They added as its a cold country so these joint problem are common here but Kyrgyz people are capable to tackle the situation with their diet and unique life style.

The epidemiology and clinical trajectory of bronchiolitis among hospitalized children in a tertiary care hospital in Osh city.

Among 7 state and privately owned hospital of osh registered with Oshsu under Ministry of Health and science of Kyrgyz Republic. We conducted this study among 200 children among age group of few months to 16 year of age.

Here we enrolled and coordinated with hospital staff to get data .

In enrolled patient and volunteers we acknowledged there were maximum female 65% in total 35% males, in osh city hospital (rheumatology department) we found two cases of JRA and in old city clinic only symptomatic patient found but on DDX they rulled out to be RA free.

Results :-

There is less prevalence of Juvenile rheumatoid arthritis as only 2 patient found in acute stage of Juvenile Rheumatoid Arthritis.

Classification

5 common Types of Arthritis

Type	Common Symptoms
Osteoarthritis	Knee pain, pain when walking, stiffness after resting, morning stiffness, trouble in bending, climbing, squatting, gripping
Lupus	Swelling of legs feet hands and periorbital swelling, mouth sores, painful and swollen joints head ache fatigue, chest pain due to pericarditis, cyanosis, sun sensitivity, blood disorder
Psoriatic arthritis	Swollen finger and toes Spinal pain , pitted nails, multiple joint involvement
Gout	Discomfort in joints even after pain vanishing, joint stiffness, inflammation, tenderness, redness, Pain in elbow, wrist, ankles, knees and fingers
Rheumatoid Arthritis	Pain swelling and stiffness in elbow, wrists feet, neck hands knees, shoulder, jaw and ankles, Morning stiffness, fatigue, appetite loss and weight loss , asymmetrical pattern in joint.

In rheumatoid arthritis or JRA we have 6 types

Oligoarticular JRA

is a type of arthritis in children where fewer joints are affected, typically involving four or fewer. It's more common in girls and often starts before the age of 6. This type might cause joint pain, swelling, and stiffness. Eye inflammation can also occur

Polyarticular JRA

is a type of arthritis in children where multiple joints, usually five or more, are affected by inflammation. This can cause pain, swelling, and stiffness in these joints. Unlike other types of JIA, polyarticular JIA often involves smaller joints, like those in the hands and feet. The condition can impact a child's daily activities

Systemic JRA

also known as Still's disease, is a rare and distinct subtype of JRA. Unlike other forms, it not only affects the joints but also involves systemic inflammation that can affect various organs throughout the body. Children with systemic JRA often experience spiking fevers, rash, and generalized symptoms such as fatigue. Joint involvement is common and can result in pain, swelling, and stiffness. The distinctive feature is the systemic inflammation, causing symptoms like high fever that tends to spike once or twice a day.

Psoriatic arthritis

Psoriatic arthritis (PsA) is a chronic inflammatory arthritis that occurs in some individuals with psoriasis, a skin condition characterized by red, scaly patches. PsA typically affects joints, causing pain, swelling, and stiffness. It can impact any joint, including fingers, toes, knees, and the spine. Skin and nail changes, such as pitting or discoloration, are common in PsA. The condition varies widely in its presentation and severity, with some individuals experiencing mild joint discomfort and others facing more severe joint damage. Psoriatic arthritis is an autoimmune disorder, where the immune system mistakenly attacks healthy tissues.

Etiology

The exact etiology of juvenile rheumatoid arthritis (JRA), is not fully understood. It is believed to involve a complex interplay of genetic, environmental, and immunological factors.

Genetic predisposition plays a role, as there is often a family history of autoimmune disorders or arthritis. Certain genetic markers are associated with an increased risk of developing JIA.

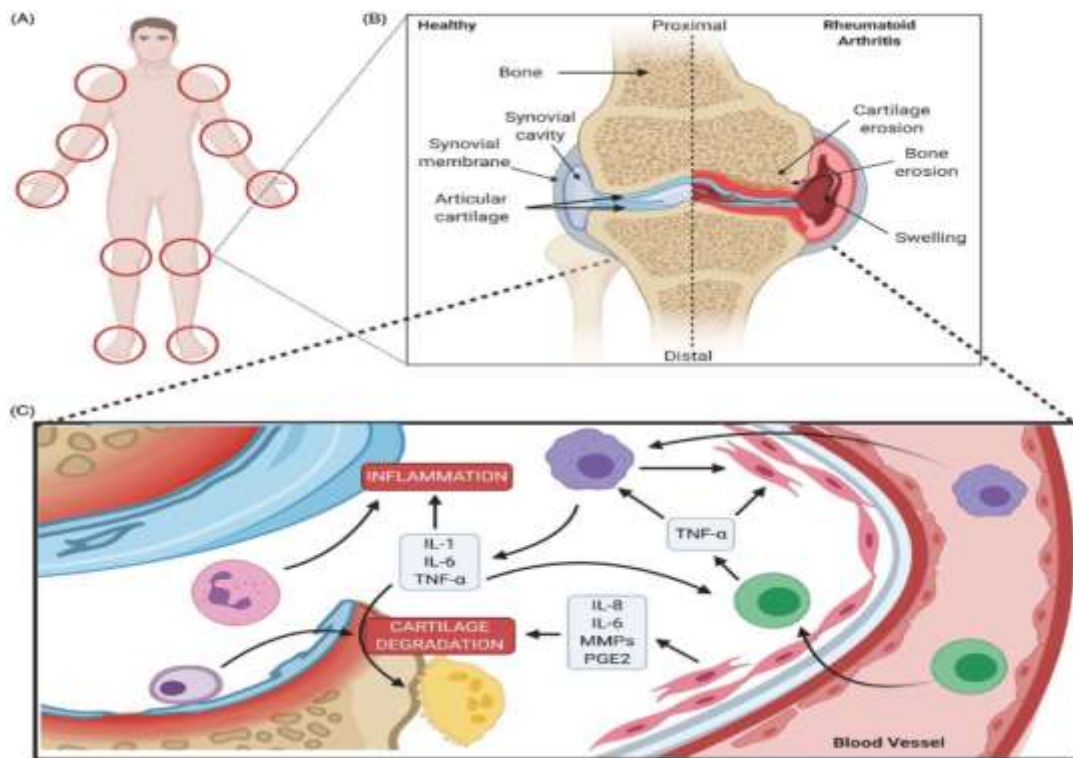
Environmental factors, such as infections, may trigger the onset of JIA in genetically susceptible individuals. Viral or bacterial infections are suspected to play a role in initiating an abnormal immune response.

The immune system dysfunction is a key component, where the body's immune system mistakenly attacks its own tissues, leading to chronic inflammation in the joints.

While the specific triggers and mechanisms are not fully elucidated, ongoing research aims to uncover the intricate details of JIA's etiology, contributing to improved understanding and more targeted therapeutic approaches.

Pathogenesis

It involves a complex series of events, primarily affecting the synovium, the lining of the joints. The process begins with the immune system mistakenly identifying components of the synovium as foreign invaders which triggers Immune cells, particularly T cells, become activated and release pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF- α) and interleukins. These cytokines trigger an inflammatory response and cytokines induce inflammation in the synovium, causing the release of enzymes that break down cartilage and bone. This leads to pain, swelling, and stiffness in the affected joints. Prolonged inflammation and the activity of destructive enzymes contribute to the erosion of cartilage and bone, leading to joint deformities and loss of function.



Clinical features and symptoms

Joint stiffness, pain, fever, limited motion, growth retardation,

Deformity, fatigue, skin changes, eye inflammation, and systemic symptoms such as enlarged lymph nodes, anemia, and weight loss

Diagnostic approaches:

Type of examination	Finding	Indication
Clinical evaluation	Onset, course	Acute, chronic
Physical examination	Stiffness, swelling, joint identification, number of joints involved, limited motion, tenderness	? JRA
Laboratory examination	<ol style="list-style-type: none"> 1. Cbc 2. ESR elevation 3. C-RP elevation 4. RA factor positive 5. Anti ccp antibody 6. HLA B27 positive 7. Joint fluid analysis 	Anemia Inflammation ?RA ? RA/ JRA

X-ray	Shows joint involvement, urea accumulation, deformity Joint erosion, joint space narrowing, soft tissue swelling, osteopenia	? RA
DDX	Infection, malignancy	



Management of juvenile rheumatoid arthritis:

For managing patient with JRA we prefer pharmacological treatment, physiotherapy, surgical intervention and correction along with supportive surgeries.

Nonsteroidal anti-inflammatory medicines (NSAIDs), to reduce pain and inflammation

Disease-modifying antirheumatic medicines (DMARDs), such as methotrexate, to ease inflammation and control JIA

Corticosteroid medicines, to reduce inflammation and severe symptoms

Medicines called biologics that interfere with the body's inflammatory response. They are used if other treatment isn't working.

Physical therapy, to improve and maintain muscle and joint function

Occupational therapy, to improve ability to do activities of daily living

Nutrition counseling

Regular eye exams to find early eye changes from inflammation

Regular exercise and weight control

Getting enough rest

Learning to use large joints instead of small joints to move or carry things

Conclusion

I and my team after 3 months of surveillance, screening and testing with the help of lab and instrumental diagnosis plus differential diagnosis of suspected patient and volunteers we came to this conclusion that our osh city is a kind of Free from Juvenile Rheumatoid Arthritis here prevalence of disease is

more among the adults in comparison with children. with utmost care and effort of our doctors and other health care worker in supervision of Health ministry of the state we are doing really well and hope further strengthening and expect downfall in JRA in future.

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