

## LEUKEMIA MIMICKING JUVENILE RHEUMATOID ARTHRITIS

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### SUMMARY:

Leukemia is the most common childhood cancer and acute lymphoblastic leukemia (ALL) represent about 75% of all cases. All patients who present with arthritis should have thorough investigations otherwise early diagnosis may be missed. This study describes four patients which presented with arthritis but later on they were diagnosed to be suffering from leukemia.

**KEY WORDS:** Leukemia, Juvenile Rheumatoid Arthritis

Pak J Med Sci January-March 2005 Vol. 21 No. 1 85-87

### INTRODUCTION

Leukemia is the commonest childhood cancer, accounting for about 33% of pediatric malignancies<sup>1</sup>. The incidence of acute leukemia in childhood seems to vary throughout the world, for every million children in the UK, about 35 new cases of acute leukemia will present per annum. This equates to a 65 in 100000 risk for boy throughout childhood up to 14 years of age and 46 in 100000 risk for girls<sup>2</sup>. Acute lymphoblastic leukemia (ALL) represents about 75% of all cases, with a peak incidence at age

4 years<sup>1</sup>. These patients may present to physicians with various clinical manifestations, hemorrhagic features being the commonest. Rarely, the cases may present with arthritic manifestations<sup>3</sup>. Several studies have indicated a link between rheumatic diseases, autoimmune phenomena and cancers. An increased risk of hematologic malignancies, compared with the general population, was found among patients with rheumatoid arthritis and systemic lupus erythematosus (SLE)<sup>3,4</sup>. Patients with malignancies may develop autoimmune and rheumatic manifestations<sup>5</sup>. We describe four patients that presented with arthritis but later on diagnosed to have leukemia.

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- \* Received for publication: June 30, 2004  
Revision received: October 13, 2004  
Revision accepted: October 17, 2004

### CASE REPORTS

#### CASE - I

A 9 years old boy was admitted in pediatric unit of Khulna Medical College Hospital with the complaints of fever for 4 months, pain and swelling of different joints for the same duration and itching of the whole body for 10 days. He had a history of fluctuating joint symptoms with morning stiffness.

On examination, he was mildly anaemic, increased temperature with cervical and inguinal lymphadenopathy, small joint arthritis and

hepatosplenomegaly. Initially it was clinically thought to be a case of systemic Juvenile Rheumatoid Arthritis (JRA). On investigation, WBC count was 11,700/cumm, N- 41% L- 55%, E- 04%, ESR -95mm in the 1st hour, peripheral blood film (PBF) was normal. RA test was negative, ASO titer was 200 units.

Patient was being treated as JRA and was kept for observation. After three months the boy became severely anaemic with haemorrhagic manifestations and was readmitted. Peripheral blood film (PBF) and bone marrow aspiration was in favor of Acute Lymphoblastic Leukemia (ALL). Management was given according to the chemotherapeutic schedule. The boy improved well and was under follow up.

#### *CASE – II*

A girl of 7 years was admitted in our unit with the complaints of fever for two months, pain in the joints for one month, itching of the body for 15 days and cough for 4 days. On examination, she had moderate anemia with increased temperature, emaciated, cervical lymphadenopathy, hepatomegaly and erythematous rash all over the body. Patient was clinically diagnosed as JRA while differential diagnosis was thought as ALL. Investigations revealed, Hb%-42%, WBC-1,40000/cumm, Platelet-40,000/cumm, ESR-160mm in the first hour, PBF revealed features of ALL. Finally bone marrow study was done which confirmed it as ALL. Management was given accordingly.

#### *CASE –III*

A female child of 3 years was admitted with complaints of fever for 5 months, pain and swelling of the joints for 3 months. On examination, the child was moderately anemic with increased temperature. There were signs of arthritis in large and small joints of limbs, but no hepato-splenomegaly or lymphadenopathy. On investigation, Hb%-50%, WBC-1,00,000/cumm, ESR 80mm in the first hour, platelet count- 85,000/cumm and PBF was suggestive of ALL. Bone marrow examination

was done to confirm the diagnosis which was in favour of ALL.

#### *CASE-IV*

A boy of 5 years was admitted in our Hospital with complaints of fever, joint (knee, Ankle) pain, weight loss for one and half months and passage of black stool for 3 days. On examination he was moderately anemic. He also had hepatomegaly, cervical and inguinal lymphadenopathy and signs of arthritis. Child was diagnosed clinically as JRA. On investigations, total count of WBC and platelet was normal. Comment on peripheral blood film was microcytic hypochromic anemia with thrombocytopenia and suggested for bone marrow study. Bone marrow examination revealed picture suggestive of ALL. He was managed according to the protocol of ALL.

Arthritis was improved in all the cases in different phases after chemotherapeutic schedule of ALL treatment.

### **DISCUSSION**

We encountered four patients during the last two years who presented with arthritis without the classical features of leukemia. We diagnosed leukemia during investigations. We missed initially one case, who later on came to us with features of leukemia and was confirmed by investigations. In our experience some of the patients of hematological malignancies may present with arthritis and are initially treated as juvenile rheumatoid arthritis. Like other studies<sup>5,6</sup>, we agree from our short experience that hematological malignancies like ALL are associated with or present with arthritis which may have auto immune phenomena. Itching was observed in our two patients. The basis of itching was not clear. In our opinion, this might be due to immunological reaction.

An increased risk of haematological malignancies, compared with the general population was found among patients with rheumatoid arthritis and SLE<sup>3,4</sup>. These features may be the result of generation of autoantibody,

paraneoplastic syndrome, direct invasion of joints and muscles by the tumor cells or combination chemotherapy<sup>5</sup>. Auto antibody activity has been identified in the sera of patients with hematological malignancies. Malignant diseases are associated with the induction of autoimmunity that is characterized by the generation of autoantibodies against wide range of autoantigens<sup>6</sup>. The antitumour immune response may result in elicitation of auto antibodies against various autoantigens including self antigens expressed in tumor cells. A large group of autoantigens are designated as tumor associated auto antigens<sup>6,7</sup>. More than 400 auto antigens have been identified by the new methodology called SEREX (Serological analysis of recombinant cDNA expression libraries of human tumors with autologous serum)<sup>8</sup>. Paraneoplastic syndrome may be the result of secretion of various hormones and hormone like peptides by tumor cells or the result of activation of autoimmune phenomena<sup>6,9</sup>. The bidirectional relation between autoimmune conditions and cancer has been recently summarised<sup>10</sup>. In our opinion, arthritis may be the autoimmune phenomena of ALL and can be taken as one of the signs. After chemotherapeutic treatment for ALL, this sign improves which give basis for the autoimmune explanation. Further studies are needed to favour this observation.

### CONCLUSION

We conclude that thorough investigations for malignancies like ALL have to be done for the patients who present with arthritis. Other wise early diagnosis may be missed and many patients may be lost without careful diagnosis and management.

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