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(CASE REPORT)

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Case Report: A rare case of PleuroPneumonia and ALL T-cell in a pediatric patient

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Abstract

The leukemias may be defined as a group of malignant diseases in which genetic abnormalities in a hemopoetic cell give rise to an unregulated clonal proliferation of cells. The progeny of these cells has a growth advantage over normal cellular elements because of their increased rate of proliferation and decreased rate of spontaneous apoptosis. The result is a disruption of normal marrow function and marrow failure. The clinical features, laboratory findings and responses to therapy vary depending on the type of leukemia. Here is presented the case of a 6-year-old boy with atypical clinical findings of Childhood acute lymphoblastic leukemia.

Keywords: Clinical Features; Children; Leukemias; ALL

1. Introduction

Childhood acute lymphoblastic leukemia (ALL) was the first disseminated cancer shown to be curable. Nearly 3100 children are diagnosed each year with a peak incidence at 2-3 years old and occurs more in boys than in girls. (5,10,11) The disease is more common in children with certain chromosomal abnormalities, such as Down Syndrome, Bloom Syndrome, Fanconi Anemia, Diamond Blackfan Syndrome, Neurofibromatosis type I, Ataxia-teleangiectasia.

The etiology of ALL is unknown, although several genetic and environmental factors are associated with childhood leukemia such as: ionizing radiation, alkylating agents, benzene exposure. (8, 9, 10) Acute lymphoblastic leukemia (ALL) accounts approximately 77 % of cases of childhood leukemias, acute myelogenous leukemia (AML) for approximately 11 %, chronic myelogenous leukemia (CML) for 2-3 % and juvenile myelomonocytic leukemia (JMML) for approximately 1-2 %. The remaining cases consist of a variety of acute and chronic leukemias that do not fit classic definition for ALL, AML, CML, or JMML. The classification of ALL depends on characterizing the malignant cells in the bone marrow to determine the morphology, phenotype as measured by cell membrane markes and cytogenetic and molecular genetic features. (5, 7, 8, 9, 10, 11) The diagnosis of ALL is strongly suggested by peripheral blood findings that indicate bone marrow failure. Anemia and thrombocytopenia are seen in most patients. Many patients with ALL present with a total leukocyte counts of < 10,000/µl. In such cases, the leukemic cells often are reported initially to be atypical lymphocytes and it is only further evaluation that the cells are found to be part of malignant clone. When the results of pheripheral blood suggest the possibility of leukemia, the bone marrow should be examinated, including bone marrow aspiration and biopsy, flow cytometry, cytogenetics and molecular studies. ALL is diagnosed by bone marrow evaluation that demonstrates > 25 % of the bone marrow cells as homogeneous population of lymphoblasts. Initial evaluation also includes CSF examination. If lymphobLasts are found and the CSF leukocyte count is elevated, overt CNS or meningeal

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leukemia is present. The staging lumbar puncture may be performed in conjuction with the first dose of intrathecal chemotherapy, if the diagnosis of leukemia is previously established from bone marrow evaluation.

The treatment of ALL is based risk directed therapy including four stages: remission induction, consolidation, intensification and maintenance; treatment of the relapse and supportive care.

Improvements in therapy and risk stratification have resulted in significant increases in survival rates, with current data showing overall 5 years survival of approximately 90 %. However, survivors are more likely to experience significant chronic medical conditions compared to their siblings, including musculoskeletal, cardiac and neurologic conditions. Overall, long term management following ALL should be conducted in a clinic where children can be followed by a variety of specialists to address the chanllenges of these unique patients. (1, 2, 4, 5, 6, 11).

Here is presented the case of a 6-year-old boy with atypical clinical findings of Childhood acute lymphoblastic leukemia.

1.1.1. Aim

The aim of this report is to highlight the importance of nonspecific clinical presentation of leukemias in making the right diagnose in time.

2. Case report

A 6-year-old boy was admitted to a regional hospital with a two days history of: high temperature, rough cough and difficulty in breathing. He was transferred to "Mother Tereza Hospital", Department of ICU Pediatrics, to further examination and treatment, for masive Pneumonia and Pleuropenumonia sinister.

He was the first child of an albanian couple, pregnancy and delivery were normal, birth weight was 4000g, vaccinated according albanian schedule. He was hospitalised 2 months ago, for URT infections, resulting in at the same time Covid positive.

2.1. Physical examination at admission noticed not good general condition.

He had an obligated orthopneic position, due to his difficulty in breathing, pale fascies, fatigue. His respiratory rate was 38-40/min; Sat O2=91% (RA); heart rate 160/min. It was noticed a total silence at auscultation of sinister pulmon and in percussion mat sound of the same lung. Abdomen was soft, palpable, enlargement of hepar et lien. There were also palpable, painless lymphonodules axilar, cervikal, inguinal.

Table 1 Laboratory examination values

White blood cells	63300 cells/mm^3
Red blood cells	3,100,000 cells/mm^3
Hemoglobin	10.3 g/dL
Platelets	70,000 cells/mm^3
LDH	3443 U/L
Aspartate aminotransferase	186 U/L
Alanine aminotransferase	255 U/L
Blood urea nitrogen	24.9 mg/dL
Creatinine	0.43 mg/dL
C reactive protein	0.2 mg/dL
D-dimer	4.82 mg/dL
Fibrinogen	354 mg/dL
PT quick time	101%
Prothrombin time/international normalized ratio (INR)	0.86

aPTT	25.7 sec
Ferritin Viral panel (HbsAg,HbC, CMV, EBV, Rubella, Toxoplasmosis, HIV) C3, C4, ANA, ANCA, Nomal	533 mg/dl Negative

According to the laboratory parameters, the patient had anemia, mild thrombocypenia and leukocytosis (RBC 3,1 million/mm^3; Hgb 10,3 g/dl; HCT 31%; WBC 63300/mm^3; Neutrophile 5600/mm^3; Lymphocite 36300/mm^3; Monocytes 17900/mm^3; PLT 70000/mm^3). His biochemical examination showed an elevated transaminase: ALT 255U/L AST 186 U/L and high level of LDH 3443U/L. C Reactive Protein (PCR) resulted normal. A high level of D dimer 4,82 mg/dl, high level of Ferritin 533mg/dl and slightly high level of Fibrinogen 354,6mg/dl. A PCR test for Covid 19 was performed, that resulted negative. Levels of C3, C4, Reumatoid Factor (RF), ANA, ANCA were normal. The Viral panel (HbsAg IgM, IgG; HbC IgM, IgG; CMV, EBV, Rubella, Toxoplasmosis, HIV) resulted negative. His coagulation indexes; TPI; CK MB; PRO BNP were normal.

At the same day it was performed a Chest X- Ray, which resulted total Sinister pulmonal opacification, meanwhile in CT thorax (IV contrast) was seen Mediastinal lymphadenopathy, heterogeny lesion localized at anterior superior mediastinum diameteres Φ 7,5x6,5 cm, paracardial extension, which was suspected as a lymphoma or thymoma. There was also massive pleural liquid in sinister hemithorax and atelectasis. In this situation it was started O2 tharapy 2l/ min with nasal canjule and antibiotic therapy (Ceftriaxone).

Due to further examination, the patient was completed with a Cardiac Ultrasonography which resulted normal, Abdominal Ultrasonography was noticed an enlargement of spleen and liver and Lymphonodal Ultrasonography showed axillar, cervical and inguinal bilateral lymph nodules.

The citology and morphology examinination of cerebrospinal liquid resulted normal. Meanwhile Citomorphology of Pleural likid puncture showed a domination of atypic lymphocites.

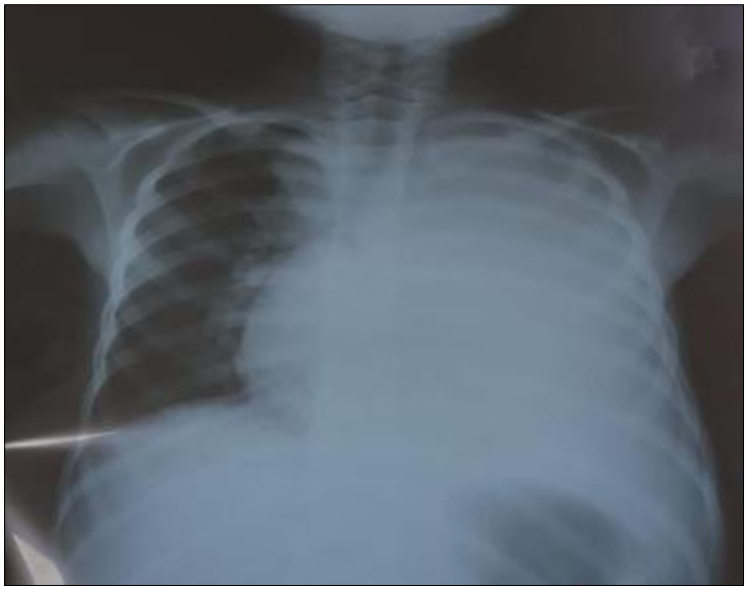

Figure 1 Chest X ray on first day of hospitalization

Pheripheric blood smears 65 % blasts; thrombocytes 47.000/ mm^3. Imunophenotype of pheripheal blood showed presence of 65 % anormal cells and monoclonal proliferation of T cells. In such situation was a high index of suspicion of Lymphoma in this patient. So, there were performed further examination to bone marrow. Bone marrow aspiration showed that 85% of the cells were blasts. Imunophenotype of bone marrow showed 85% blasts and monoclonal proliferation of T cells. The patient was diagnosed as an ALL with T-cells with pulmonary infiltrated mass.

At his third day of hospitalization, it was started AIEOP 9502 (old) Protocol: Prephase & Induction phase (Prednisolone, Vincristine, Doxorubicine and one single dose of L-Asp).

On his Day 8^0 of hospitalization, he was under therapy only with Prednislone and antibiotics. It was performed a Chest X-Ray which resulted as a noticeable improvement. It persisted lightly changes at basal sinister pulmon.

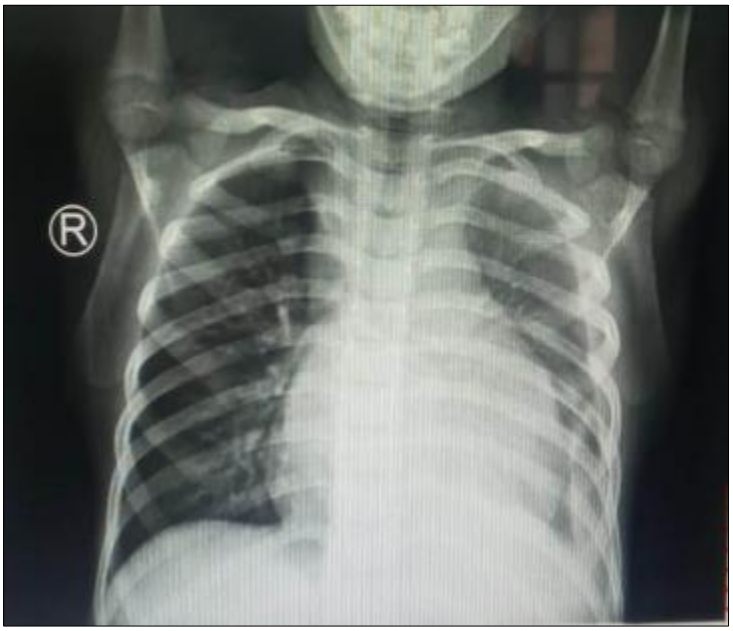

Figure 2 Chest X ray in 8^0 days of hospitalization

Actually, patient is under chemotherapy. He has a satisfactory clinical progress and he is considered as "Good responder".

3. Discussion

The leukemias are the most common malignant neoplasms in childhood, accounting 31 % of all malignancies that occur in children younger than 15 years old. Each year, leukemia is diagnosed in 3100 children and adolescents, an annual incidence of 4.5 cases per 100.000 children. The initial presentation of ALL usually is nonspecific and relatively brief. Anorexia, fatigue, malaise, irritability, low grade fever are often present. Bone or joint pain, particulary in lower extremities may be present. As the disease progresses, signs and symptoms of bone marrow failure become more obvious with the occurance of pallor, fatigue, exercise intolerance, brusing, oral mucosal bleeding or epistaxis. Organ infiltration can cause lymphadenopathy, hepatosplenomegaly, testicular enlargement or central nervous system involvement, which include increased intracranial pressure, papilledema, retinal hemorrhages, seizures, headaches and cranial nerve palsies. (1 ,2, 3, 4, 5) We observed association between pleural effusion and leukemia on a pediatric patient. While lymphadenopathy is the most common manifestation of leukemia in the thorax, leukemia also may involve the lungs, pleura, pericardium, bones and soft tissues. (1,2). Based on evidences the mediastinal mass can be >1/3 of thoracic diameter on D5 level (mediastinum/thorax >0,33) (3,4). Leukemic involvement of the pleura manifests with :(a) pleural effusion, (b) pleural masses or thickening, or (c)a combination of the two (5,6). Respiratory distress in our patient occurs as a result of a large anterior mediastinal mass. This problem is frequently seen in adolescent boys with T cell ALL, who also has a higher leukocyte count.

4. Conclusion

The initial presentation of ALL is usually nonspecific but it can envolve in the presence of a massive pleural effusion, pulmonary mass with signs of hepatosplenomegaly and lymphadenopathy should consider the possibility of Leukemia. So, a high index of suspicion should be kept while valuating a child with Fever of Unknown Origin.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed Consent was taken from the parents of hospitalized child, reported in the study, for using the data of the medical records, and photos, providing anonymity.

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