Recurrent Pneumonias and Bronchiectasis - Is it an Immunodeficiency Disorder? - A Case Report

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ABSTRACT

Common Variable Immunodeficiency (CVID) is a form of primary immunodeficiency disorder characterised by hypogammaglobulinemia and recurrent sino-pulmonary infections. Its diagnosis is based on the presence of low serum IgG (< 2 SD below normal for age) with or without low IgA/ IgM levels and presentation beyond two years of age. These children also have disorders of autoimmunity with majority of them presenting as autoimmune cytopenias, predominantly thrombocytopenia and some having anaemia and neutropenias. Here we report a nine years old boy with past history of recurrent pneumonia, presenting this episode with fungal pneumonia, thrombocytopenia and anaemia eventually diagnosed as CVID.

Key words: common variable immunodeficiency; cytopenias; fungal pneumonia; recurrent pneumonia

INTRODUCTION

Common Variable Immunodeficiency (CVID) is a syndrome of highly heterogeneous primary immunodeficiency disorders characterised by hypogammaglobulinemia and protean clinical characteristics. It is the commonest form of antibody defects.[1] The diagnosis of CVID is based on the simultaneous presence of low serum IgG (2 SD below the age-adjusted norms) with low IgA and/or IgM levels.[2] The age of presentation of CVID is later in childhood.[3] Clinically, a vast majority of patients with CVID present with recurrent sino-pulmonary bacterial infections.[4] Apart from this, these individuals also present with gastrointestinal, viral and systemic bacterial infections. Besides infections, patients with CVID also present with a wide array of non-infectious complications including autoimmunity, granulomatous disease, enteropathy, splenomegaly and solid tumours.[5] These patients also have autoimmune cytopenias including thrombocytopenia, anaemia and neutropenia.[2] Treatment of CVID includes a multi-disciplinary approach with the best results obtained with intravenous immunoglobulin (IVIG).[6] Here we report a case of nine years old boy with CVID presenting with recurrent respiratory infections, cytopenias and hepatosplenomegaly. As per our knowledge, this is the first case being reported from our country.

CASE REPORT

A nine year old boy presented to our set up with history of fever for one week and cough, difficulty breathing and fast breathing for two days. There was no history of hemoptysis or significant weight loss. The child had been diagnosed as a case of pulmonary tuberculosis and received Category I Anti-Tubercular Treatment (ATT) for duration of six months one and half years back. Despite receiving Cat I ATT there was no resolution of symptoms and hence the child again received Category II ATT which was completed just two months prior. The child was born to non consanguineous marriage and was 3rd in order of the five siblings with no significant birth and past history. Developmental and immunisation history were as per age. At admission the child was afebrile, HR - 120 beats/min, BP - 100/45 mm Hg, RR - 42 breaths/minute with nasal flaring and SpO_2 - 86% at room air and 99% with O_2 via nasal prongs. The child was pale. Rest of the general examination was normal. His weight and height were both below the third centile (Figure 1). Respiratory system examination showed intercostal retractions with crepitations, decreased air entry and bronchial breath sounds over right mammary, supramammary and axillary areas. On examination of the abdomen there was hepatomegaly of four cm and splenomegaly of three cm. Rest of the examination was within normal limits.

On admission laboratory examination revealed Hb: 6.8 gm%, Total leucocyte count: 5300 (N84 L13), Platelets 30,000/mm^3, hypoalbuminemia (total albumin: 2.9 g%), positive C-reactive protein, peripheral smear showed microcytic hypochromic RBCs with reduced platelets, HIV I and II was negative, chest X-ray showed consolidation in right lung field (Figure 2) and HRCT of chest showed evidence of bronchiectasis (Figure 3). The child was then started on IV antibiotics which included ceftriaxone, vancomycin, ceftazidime, linezulid and meropenem. But there was no clinical improvement. Sputum for AFB stain and gene x-pert was also negative. Bone marrow examination was normal. Sputum for KOH mount revealed "Hyaline branched septate fungal hyphae". Subsequently child was started on Voriconazole and improved. Ultimately immunoglobulin panel were sent which revealed IgG: 287 mg/dl, IgM < 20 mg/dl and IgA 33 mg/dl which were all below more than 2 SD of normal.[7] Hence on the basis of European Society of Immune Deficiencies (1999) criteria, a diagnosis of probable CVID was made and the child was administered IVIG which showed dramatic response with resolution of all clinical and laboratory parameters. At one month follow-up the child had gained weight and had resolution of chest X-ray findings.

DISCUSSION

Clinically CVID can have versatile presentations ranging from recurrent infections, autoimmune disorders to malignancies. Among the infectious disorders respiratory system involvement is predominant.[4] These patients typically have

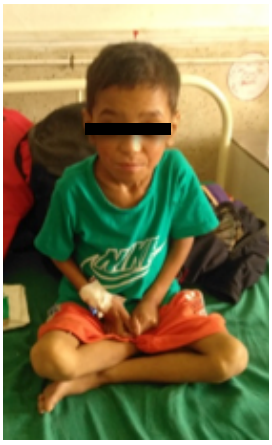

Figure 1. Appearance of child prior to treatment

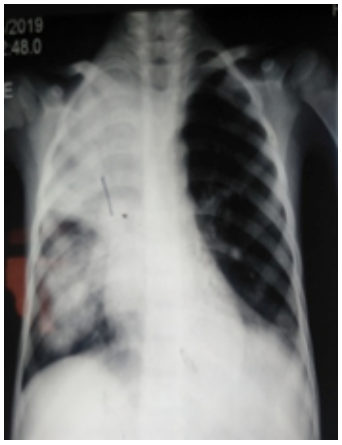

Figure 2. Chest X-Ray prior to treatment

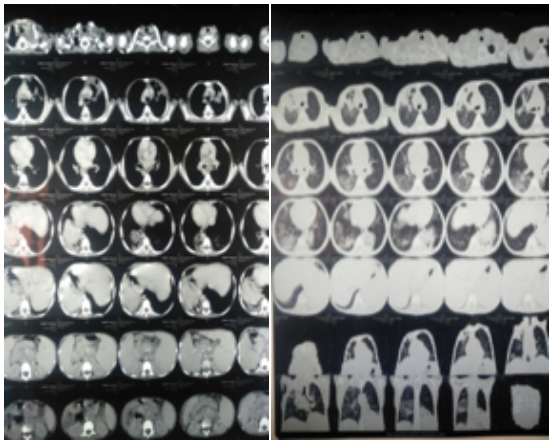

Figure 1. CT scan of chest showing evidence of bronchiectasis

recurrent pneumonia and as a result develop various lung complications including chronic lung disease and bronchiectasis.[8] Our case also had recurrent pneumonias not responding to conventional therapies and subsequently developed bronchiectasis. He was subsequently diagnosed to have fugal pneumonia, which indicated primary immunodeficiency disorder.[9]

The child also had hepatosplenomegaly and bicytopenia (microcytic hypochromic anaemia and thrombocytopenia). It has been reported that autoimmune haematological abnormalities, specifically cytopenias, are the most common of all autoimmune manifestations in CVID and may present as thrombocytopenia, anaemia or neutropenia.[2] Autoimmune cytopenias account for four to 20% of patients of CVID who have some form of autoimmunity.

There are various criteria for the diagnosis of CVID.[10] But because of the ease of application we selected the European Society of Immune Deficiencies (1999) criteria to diagnose our case. ESID (1999) categorises CVID as either probable or possible CVID. A diagnosis of probable CVID is made if a male or female patient who has a marked decrease of IgG (at least 2 SD below the mean for age) and a marked decrease in at least one of the isotypes IgM or IgA, and fulfils all of the following criteria: Onset of immunodeficiency at greater than two years of age; Absent isohemagglutinins and/or poor response to vaccines and defined causes of hypogammaglobulinemia have been excluded. Similarly a diagnosis of possible CVID is made if a male or female patient who has a marked decrease (at least 2 SD below the mean for age) in at least one of the major isotypes (IgM, IgG, and IgA) and fulfils all of the following criteria: Onset of immunodeficiency at > two years of age; Absent isohemagglutinins and/or poor response to vaccines; and defined causes of hypogammaglobulinemia have been excluded. Hence on the basis of presence of past history of recurrent pneumonia, bronchiectasis, presentation this time to our centre with fungal pneumonia, cytopenias, splenomegaly and markedly decreased IgG, IgM and IgA all < 2 SD below mean for age, a diagnosis of CVID was made and specific treatment in the form of IVIG was administered with resulted in dramatic clinical improvement.

CONCLUSIONS

CVID should always be considered in children presenting beyond five years of age with recurrent respiratory infections and cytopenias which are not amenable to conventional therapies. Early diagnosis and specific treatment results in a favourable outcome.

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