

## A 2 MONTH OLD WITH COUGH SINCE BIRTH

**Clinical Problem :** A 2 year old girl born of third degree consanguineous marriage presented with fever, cough and breathlessness since 3 months. She had been treated for same with multiple antibiotics but had no response. There was no history of any contact with tuberculosis (TB). She was a full term vaginal delivery with birth weight of 3 kg. She has an elder 5 year old brother who is normal. Her immunization and milestones are up to date. She has a poor diet intake and eats only milk, chapatti and dal rice. On examination, she had bell shaped chest, beading, wrist widening and double malleoli. She had bilateral crepitations and Grade III Clubbing. Other systemic examination was normal.

Investigations showed:

- CBC = Normal
- Liver and Renal function tests = Normal
- Venous blood gas = No acidosis
- S. calcium = 9.8 mg/dl, phosphorus = 2.3 mg/dl, and alkaline phosphatase = 2962 IU/L.
- Chest X-Ray = Bilateral bronchopneumonia
- Gastric lavage = Gram negative bacilli
- HIV = Negative
- Sweat chlorides = Normal
- Mantoux test = Negative
- X-Ray wrist = flaying, fraying of metaphysis

She was treated with intravenous antibiotics and chest physiotherapy with mucolytic therapy for her pneumonia to which she responded.

### What is the cause of her persistent pneumonia?

**Expert Opinion:** This child has severe bony defects with bell shaped chest. This type of bone disease can also be seen with Metaphyseal dystrophy, renal tubular acidosis and rickets. In this child, there is no metabolic

acidosis ruling out renal tubular acidosis. Also X-Ray is classically suggestive of rickets. In addition, her serum phosphorus is low and alkaline phosphatase is elevated suggestive of untreated rickets. Metaphyseal dystrophy would have normal serum calcium, phosphorus and alkaline phosphatase. Thus, the bony defects are due to rickets. Severe rickets can lead to chest deformity and collapse of the rib cage leading to a bell shaped chest due to soft bones and weak muscles. Due to decrease in the total lung capacity because of small chest, there is hypoventilation and decreased recruitment of alveoli in the process of respiration. Also, due to improper cough mechanism, the secretions tend to pool and cannot be removed leading to a source for infection to settle in. Thus, in this patient, recurrent pneumonia is due to rickets. Treatment consists of good chest physiotherapy, treatment of rickets in addition to specific treatment for pneumonia.

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