Pulmonary Alveolar Proteinosis A Rare Disease

Nilesh Kumar*, Jyoti K, Sashi Ranjan*, Ankur Nandan Varshney*, Arvind Anand*, Ravi Anand***

*Institute of Medical Sciences, Banaras Hindu University, **Ranchi Medical College

Abstract : Pulmonary alveolar proteinosis is a rare lung disease in which abnormal accumulation of surfactant occurs with in the alveoli, interfering with gas exchange. PAP can occur in a primary form or secondarily in the settings of malignancy , pulmonary infection, or environmental exposure to dusts or chemicals. Rare familial forms have also been recognized suggesting a genetic component . we are going to present a rare case of pulmonary alveolar proteinosis. [Kumar N et al NJIRM 2013; 4(5) : 106-108]

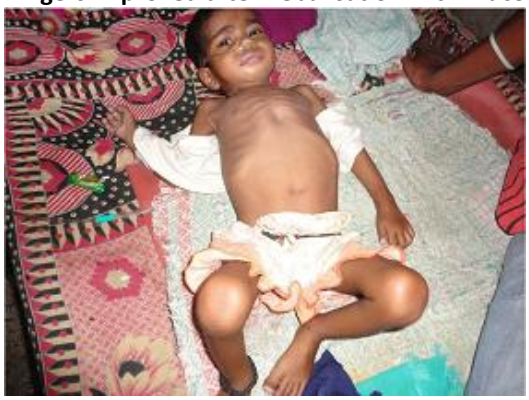
Key Words: Alveolar Proteniosis, Pulmonary

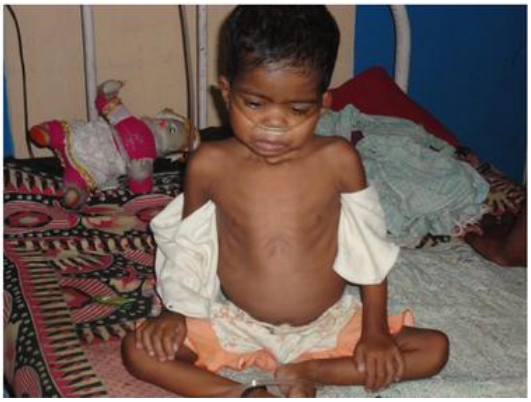
Author for correspondence: Nilesh Kumar, Department of General Medicine, Institute of Medical Sciences, Banaras Hindu University, E-mail : nilesh19arreno@gmail.com

Introduction: Pulmonary alveolar proteinosis is a disorder charecterised by intra alveolar accumulation of pulmonary surfactant lipoproteins. The distal airways are filled with granular eosinophilic material that stains positive with PAS.[1] Two clinically distinct type are found in children, a fulminant often fatal form presenting shortly after birth(congenital PAP); and a gradually progressive type presenting in older infant and children. In older children it is classified as primary & secondary. Early onset PAP has familial clustering suggesting genetic basis with mutation in surfactant protein-B prot β-chain of granulocyte macrophage colony stimulating factor.Primary(idiopathic)PAP in adults is an autoimmune disease whereas secondary alveolar proteinosis can occur in association with infection,malignancy & immunosuppression.[2] due to its rarity we are going to present this case.

Case Report : A 18 months old female child a product of non consanguineous marriage came to hospital with presenting complains of cough, fever & bluish discolouration of finger tips from last one month. The child was born at hospital at term by Normal Vaginal delivery & cried immediately after birth. Exclusive breast feeding was done till 6 months and she was asymptomatic. 1 year back she developed cough & cold with fever. For these complains local doctors were consulted & there was mild symptomatic improvement. Recurrence occurred after discontinuation of medication. Since last one month there was increased frequency of symptoms ,increase in breathing difficulty, abnormal body movement & bluish discolouration of tongue and oral mucosa along with clubbing (Figure 1) For these complains the child was

Figure 1 & 2: Patient of PAP with clubbing in all toes and fingers improved after nebulisation with mucomix



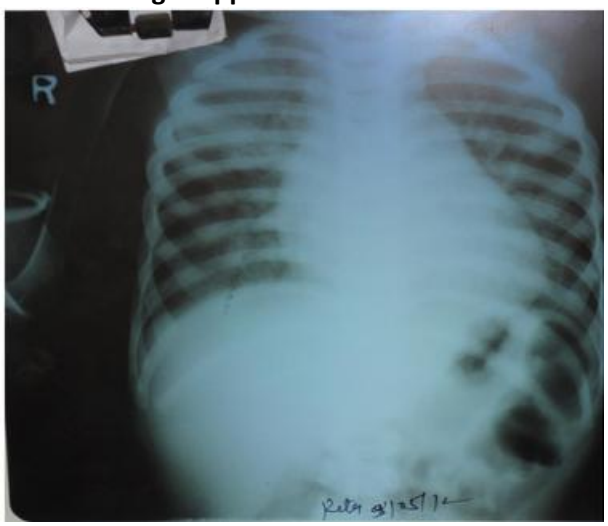


admitted at some hospital outside for 15 days. From there the patient came at our institute. Here X-Ray chest was done & higher antibiotics were started. X-Ray showed consolidation in right upper & middle lung fields. (Figure 2) There was no symptomatic improvement & no X-Ray clearance. A trial of ATT was given but then also symptoms persisted.

Lab investigations showed Hemoglobin 10 g/dl Total Leucocyte Count -35000/cmm Neutrophil - 61% and lymphocytes 34.9%. HIV Elisa test was negative .Contrast Enhanced Computed

Tomogaphy Thorax was planned & report showed ground glass opacity with smooth interlobar thickening involving whole of lung fields - crazy paving pattern. Air bronchogram was seen in both lung fields S/O pulmonary alveolar proteinosis**.** (Figure 3) Nebulisation with N-acetyl cystine 6 hrly was started along with Oxygen inhalation and all other medications including ATT was stopped. The child improved & became stable but O2 inhalation has to be continued to maintain saturation.

Figure 3: X-ray Showing patchy opacities more in right upper and middle zone



Discussion: In our case there was dyspnoea since 6 months of age, cyanosis, clubbing & no response to antibiotics & antituberculous treatment ,X-ray showing non resolving opacities & CECT showing characteristic features of PAP. Although the cause of PAP remains obscure, etiology of the disease came by the chance observation that mice bred for experimental study to lack a hematologic growth factor known as granulocyte-macrophage colony stimulating factor developed a pulmonary syndrome of abnormal surfactant accumulation resembling human PAP.[3] The presence of anti-GM-CSF autoantibodies in patients with PAP, and duplicated that syndrome with the infusion of these autoantibodies into mice.[4] Chest x-rays of affected individuals typically reveal nonspecific alveolar opacities. CT image lung lavage shows extensive bilateral ground- glass and interstitial opacities that gave clue for diagnosis of PAP. Diagnosis is generally made by surgical or endoscopic biopsy of the lung, revealing the distinctive pathologic finding. The current gold standard of PAP diagnosis involves histopathological examination of alveolar specimens obtained from bronchoalveolar lavage and transbronchial lung biopsy.[5] On microscopic evaluation the distal air spaces are filled with a granular, eosinophilic material that is positive with the PAS stain and the PAS diastase stain . The main histomorphologic differential diagnosis is pulmonary edema which does not have dense bodies. The first advance in the treatment of Pulmonary Alveolar Proteinosis came in November 1960.[6] when Dr. Jose Ramirez-Rivera at the Veterans' Administration Hospital in Baltimore applied repeated "segmental flooding" as a means of physically removing the accumulated alveolar material.[7] The standard treatment for PAP is whole lung lavage, in which sterile fluid is instilled into the lung and then removed, along with the abnormal surfactant material. This is generally effective at ameliorating symptoms , often for prolonged periods. Since the mouse discovery noted above, the use of GM-CSF injections has also been attempted, with variable success. Lung transplantation can be performed in refractory cases.[8,9] The disease is more common in males and in tobacco smokers. In a recent epidemiologic study from Japan Autoimmune PAP has an incidence and prevalence higher than previously reported and is not strongly linked to smoking, occupational exposure, or other illnesses.[10].

Conclusion: Allopathic drugs are highly and irrationally prescribed by AYUSH practitioners. Maximum irrational prescribing practice was seen in FDCs as compared to single drugs.

References:

1. Rosen SH, Castleman B, Liebow AA. Pulmonary alveolar proteinosis. N Engl J Med. Jun 5 1958;258(23):1123-42.
2. Griese M, Brasch F, Aldana VR, Cabrera MM, Goelnitz U, Ikonen E, et al. Respiratory disease in Niemann-Pick type C2 is caused by pulmonary alveolar proteinosis. Clin Genet. Feb 2010;77(2):119-30.
3. Stanley E, Lieschke GJ, Grail D, et al. (June 1994). "Granulocyte/macrophage colony-stimulating factor-deficient mice show no major perturbation of hematopoiesis but develop a characteristic pulmonary pathology". Proc. Natl. Acad. Sci. U.S.A. 91 (12): 5592–6. doi:10.1073/pnas.91.12.5592.
4. Uchida K, Beck D, Yamamoto T, Berclaz P, Abe S, Staudt M, Carey B et al. (2007). "GM-CSF autoantibodies and neutrophil dysfunction in pulmonary alveolar proteinosis". N Engl J Med 356 (6): 567–79. doi:10.1056/NEJMoa062505. PMID 17287477.
5. Monisha Das, MD And Gary A. Salzman, MD (February 2010). "Pulmonary Alveolar Proteinosis: An Overview for Internists and Hospital Physicians". Hospital Practice. 38 (1): 43–49. doi:10.3810/hp.2010.02.277. PMID 20469623.
6. Ramirez-Rivera J, Nyka W, McLaughlin J (1963). "Pulmonary Alveolar Proteinosis: Diagnostic Technics and Observations". New England Journal of Medicine 268 (4): 165–71. doi:10.1056/NEJM196301242680401. PMID 13990655.
7. Ramirez-Rivera J, Schultz RB, Dutton RE (1963). "Pulmonary Alveolar Proteinosis: A New Technique and Rational for Treatment". Archives of Internal Medicine 112: 173–185.
8. Ceruti M, Rodi G, Stella GM, et al. (2007). "Successful whole lung lavage in pulmonary alveolar proteinosis secondary to lysinuric protein intolerance: a case report". Orphanet J Rare Dis 2: 14. doi:10.1186/1750-1172-2-14 PMC 1845139 PMID 17386098.
9. Menard KJ (April 2005). "Whole lung lavage in the treatment of pulmonary alveolar proteinosis" J. Perianesth. Nurs. 20 (2): 114–26. Doi 10.1016/j.jopan.2005.01.005 PMID 15806528.
10. Inoue Y, Trapnell BC, Tazawa R,et (April 2008). "Characteristics of a Large Cohort of Patients with Autoimmune Pulmonary Alveolar Proteinosis in Japan". Am. J. Respir. Crit. Care Med. 177 (7): 752–62. doi:10.1164/rccm.200708-1271OC. PMC 2720118. PMID 18202348.

Conflict of interest: None
Funding: None