Scholars Academic Journal of Biosciences (SAJB) **ISSN 2321-6883 (Online)**
Sch. Acad. J. Biosci., 2014; 2(10): 728-730 **ISSN 2347-9515 (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublisher.com

Case Report

Niemann Pick Disease Type A in an Infant: A Case Report

Shubhankar M[1], Sunil K. A.[2], Bikash R.P.[1], Shantanu K.M.[1]
[1]Junior resident, [2]Associate professor, Department of Paediatrics, MKCG Medical College, Berhampur, Odisha-760004, India

***Corresponding author**
Shubhankar Mishra
Email: dr.subham.scb@gmail.com

Abstract: Niemann-Pick Disease is an autosomal recessive disorder of infancy characterized by failure to thrive, hepatosplenomegaly and neurodegenerative changes. Inherited deficiency of acid sphingomyelinase activity leads to sphingomyelin and cholesterol storage within the lysosome. The clinical phenotype ranges from a severe infantile form with neurologic degeneration resulting in death usually by 3 years of age (type A) to a later-onset non neurologic form (type B) that is compatible with survival into adulthood. We present a case of niemann-pack disease with galaxy of typical and atypical presentation. It's a rare disease in India.
Keywords: Niemann-Pick, Sphingomyelinase, Lysosome.

INTRODUCTION

Niemann-Pick disease types A and B are caused by an inherited deficiency of acid sphingomyelinase activity [1]. NPD type A is a fatal disorder of early childhood characterized by failure to thrive, hepatosplenomegaly, and a rapidly progressive neurodegenerative course that leads to death by age 2-3 years [2]. In the classic infantile type-A variant, a missense mutation cause's complete deficiency of sphingomyelinas it is more common in Ashkenazi Jewish population [3, 4]. NPD Type B is most commonly seen. Mutations in the *SMPD1* gene is the primary cause. Our presentation will help physicians diagnose the entity easily.

CASE REPORT

A nine month male child was presented to paediatric opd with intermittent fever for 3 months, abdominal distention for 2 months and excessive cry for 2 days. He was the first child of a 3rd degree consanguineous marriage. No similar history was in past. Birth history was uneventful with a birth weight of 3.5 kg. He was exclusively breastfed and immunized as per age. On examining child was conscious and irritable with some pallor. He had lowset ears, facial dysmorphism (Fig. 2), persistent mongolian spot all over body (Fig. 1) with features of undernutrition. There were multiple Mongolian spots allover in his body (typical and atypical sites). Weight was 6.5 kg and head circumference was 41 cms. On examining abdomen liver is 6 cms, with spleen 5 cms.other systemic examinations were with in normal range. On ophthalmic examination there were multiple cherry red spots in the fundus.On investigating the case there was Hb-9.9gm% TLC was 15,200/mm^3 (N 38,L 57, E 03, M 02)TPC was 4.5 lac. Reticulocyte count was 0.5%. ps showed normocytic normochromic anemia. PT INR was normal. Total bilirubin was 0.7mg/dl, direct fraction was 0.4mg/dl, SGOT-635 IU/L, SGPT-406 IU/dl, sr.alp-538, sr.protein-6gm%, sr albumin-4gm%, HBsAg was negative. X-ray imaging of chest and spine were normal. ICTC was non reactive. Sickling test was negative. Hb electrophoresis showed AA band. Liver biopsy was done. It showed features of foamy cells with microvacuolated hepatocytes (Fig. 3).

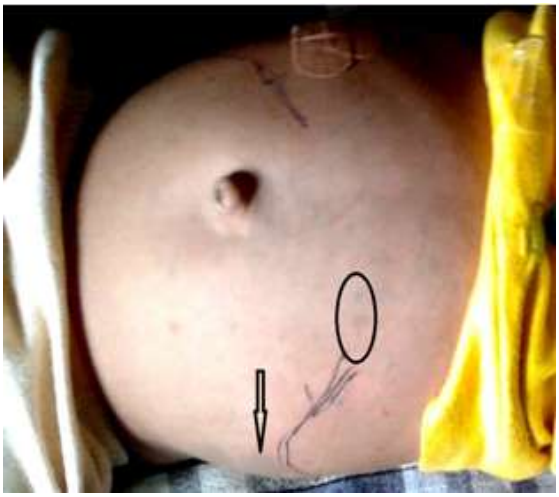

Fig. 1: Multiple Mongolian spots with hepatosplenomegaly

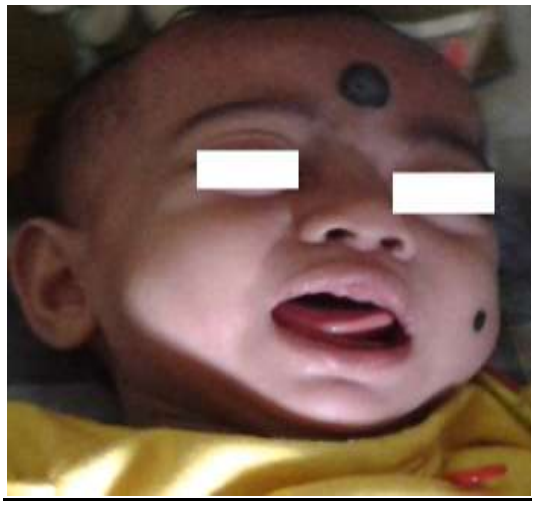

Fig. 2: Syndromic dysmorphic facies with low set ear

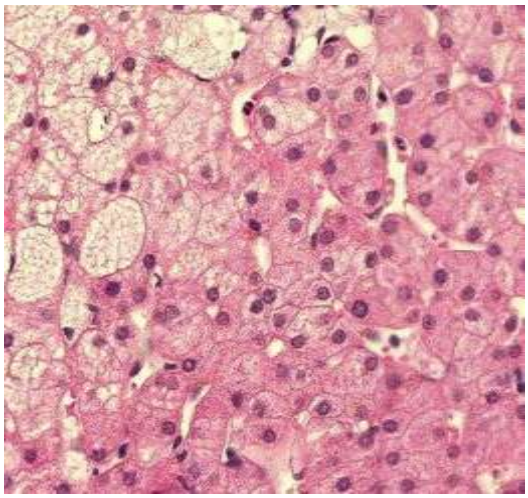

Fig. 3: Liver biopsy with foamy infiltration and histiocytes

DISCUSSION

Niemann Pick Disease is autosomal recessive disease. NPD type A is a rapidly developing metabolic illness [5]. The name Niemann-Pick is derived from two German pediatricians - Albert Niemann, who first identified the Type A in 1914, and Ludwick Pick, who first identified the Type B in 1927 [6, 7]. Both forms of NPD are both caused by the deficient activity of the enzyme acid sphingomyelinase (ASM) leading to the accumulation of sphingomyelin in the monocytes, reticulo endothelial system and in type A even in the central nervous system [8, 9]. The clinical spectrum of this disorder ranges from the infantile, neurological form that results in death by 3 years of age (type A NPD) to the non-neurological form (type B NPD) that is compatible with survival into adulthood [1]. A review of English medical literature shows that 1,200 cases of NPA and NPB worldwide have been reported with the majority being Type B or an intermediate form. The cause of this type of deficiency in sphingomyelinase is mutation in SMPD gene [3]. Thus patients present with progressive lung disease, hepatosplenomegaly, short stature and pancytopenia. Niemann Pick Disease type A is usually fatal [10]. It leads to severe neurological symptoms, hepatosplenomegaly and cherry red spot in eye. In later stages, spasticity and rigidity may be seen [4].

Classically Niemann Pick Disease is classified into four subtype [5]

- Niemann Pick Disease type A: classic infantile
- Niemann Pick Disease type B: visceral
- Niemann Pick Disease type C: subacute / juvenile
- Niemann Pick Disease type D: Nova Scotian

Some intermediate forms are also there. Type E patients are adults with moderate hepatosplenomegaly and some increase in sphingomyelin in the liver, spleen, and bone marrow [6]. F for a form characterized in 2 patients by childhood onset of splenomegaly, lack of neurologic involvement, diminished sphingomyelinase activity, and thermolabile enzyme [7]. Niemann-Pick disease types E and F have not been well-characterized. Diagnosis of Niemann Pick Disease is by clinical picture, liver biopsy and histopathology finding of Niemann Pick cells on bone marrow examination. Diagnosis is confirmed by measurement of sphingomyelinase enzyme on cultured fibroblasts. No specific treatment is known for type A, but symptoms are treated. In Type-B the cholesterol level is kept in limit. For Type-c treatment with 2-hydroxypropyl-β-cyclodextrin has showed some good results [8]. Prognosis is very bad in type A (85% die before 18 months [9]. Type B children live comparatively longer but require supplemental oxygen due to lung impairment. Genetic counselling and genetic testing is recommended for families who maybe carriers of Niemann Pick.

CONCLUSION

NPD type A is a fatal disease. No treatment available for it till now. Early diagnosis and management of complication will help to increase life span of the child.

REFERENCES

1. Horinouchi K, Erlich S, Perl DP, Ferlinz K, Bisgaier CL, Sandhoff K, Desnick RJ ; Acid sphingomyelinase deficient mice: a model of types A and B Niemann–Pick disease."Nature genetics, 1995; 10(3): 288-293.
2. Schuchman EH; The pathogenesis and treatment of acid sphingomyelinase-deficient Niemann–Pick disease. Journal of inherited metabolic disease, 2007; 30(5): 654-663.
3. Camoletto PG, Vara H, Morando L, Connell E, Marletto FP, Giustetto M, Sassoè-Pognetto M et al; Synaptic vesicle docking: sphingosine regulates syntaxin1 interaction with Munc18. PLoS One, 2009; 4(4): e5310.

4. Ira Shah http:/www.pediatriconcall.com /fordoctor/casereport/niemann pick disease.asp.2006
5. International center for type A & type B Niemann P ick disease 2010 The Mount Sinai Medical Center www.mssm.edu/research
6. Lynn R, Terry RD; Lipid histochemistry and electron microscopy in adult Niemann-Pick disease. The American journal of medicine, 1964; 37(6): 987-994.
7. Schneider EL, Pentchev PG, Hibbert HS, Sawitsky A, Brady RO; A new form of Niemann-Pick disease characterised by temperature-labile sphingomyelinase. Journal of medical genetics, 1978; 15(5): 370-374.
8. Liu B, Turley SD, Burns DK, Miller AM, Repa JJ, Dietschy JM; Reversal of defective lysosomal transport in NPC disease ameliorates liver dysfunction and neurodegeneration in the npc1−/− mouse. Proc. Natl. Acad. Sci. 2009; 106 (7): 2377–2382.
9. Neufeld EB, Wastney M, Patel S, Suresh S, Cooney AM, Dwyer NK, Roff CF, et al. The Niemann-Pick C1 protein resides in a vesicular compartment linked to retrograde transport of multiple lysosomal cargo. Journal of Biological Chemistry, 1999; 274(14): 9627-9635.