International Neonatology Association

8th International Neonatology Association Conference

7-10 September 2023 | Dublin, Ireland

Wolman Disease: A Rare Disorder Observed in Early Infancy

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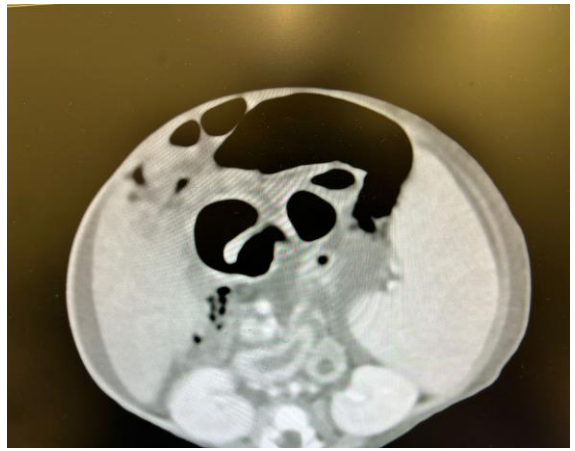
Background: Wolman disease is observed in conditions wherein the lysosomal acid lipase (LAL) enzyme activity is less than 1% and is characterized by vomiting, diarrhea, poor weight gain, hepatosplenomegaly, and liver failure in the initial months of life (1). The LAL enzyme is the primary enzyme responsible for the hydrolysis of cholesterol esters and triglycerides following the receptor-mediated endocytosis of low-density lipoprotein. The definitive diagnosis of Wolman disease is by measuring LAL enzyme activity in leukocytes or fibroblasts and by LIPA gene analysis (2, 3, 4)

Objective: To reveal Wolman's disease's clinical manifestations, diagnostic approaches, and treatment methods.

Methods: This is a case report of a male patient diagnosed with Wolman Disease due to the detection of decreased LAL enzyme activity and, subsequently, LIPA gene defect, who died at 68 days of age following cardiac arrest.

Results: A male infant born uneventfully via cesarean section at 38 weeks of gestation from a healthy 24-year-old mother admitted to the emergency department at postnatal 72 hours with abdominal distension. There was a consanguineous marriage between the parents, the mother's pregnancy was unfollowed, and she gave birth at home. Physical examination revealed hepatosplenomegaly and jaundiced skin. Laboratory values indicated elevated liver enzyme levels (ALT 61 U/L, AST 130 U/L), cholestasis (Total Bilirubin 4.39 mg/dL, Direct Bilirubin: 3.93 mg/dL), and coagulopathy (aPTT: 47.2 seconds, PT: 38.8 seconds, INR: 3.2). The patient was admitted to the neonatal intensive care unit for further investigations and treatment.

Urine tests for reducing substances, sugar chromatography, urine organic acids, tandem mass spectrometry, blood amino acids, very long-chain fatty acids, alpha-1 antitrypsin, TORCH infections, LDL, HDL, total cholesterol, triglycerides, LAL enzyme analysis and LIPA gene analysis for Wolman Diseases, and enzyme analysis for Niemann-Pick disease type C were done. Biliary ultrasonography was performed to exclude biliary atresia. The galactosemia screening test was negative, while sugar chromatography in urine was positive for galactose and lactose. Metabolic tests were normal including tandem mass spectrometry, urine organic acids, amino acids, very long-chain fatty acids, and cholesterol. Biliary ultrasonography revealed no signs of biliary atresia. Decreased LAL enzyme activity in plasma and subsequent LIPA gene analysis confirmed the diagnosis of Wolman disease. IV cefotaxime and gentamicin were initiated for potential infectious agents. ADEK was replaced. The patient had an erythrocyte transfusion and fresh frozen plasma (FFP) for anemia and ongoing coagulopathy. The abdominal tomography revealed hepatosplenomegaly and extensive calcification involving both adrenal glands, consistent with Wolman disease. Echocardiographic examination showed a 5 mm diameter ASD and peripheral pulmonary stenosis. Despite treatment, the patient died due to cardiac arrest on the 65th day of hospitalization.



Conclusion: Lysosomal acid lipase deficiency is a rare, autosomal recessive condition caused by mutations in the gene encoding lysosomal acid lipase (LIPA) that result in reduced or absent activity of this essential enzyme. The severity of the resulting disease depends on the nature of the underlying mutation and the magnitude of its effect on enzymatic function. Wolman's disease is a severe disorder that presents during infancy, failing to thrive, hepatomegaly, hepatic failure, and an average life expectancy of less than four months. (5) The life expectancy may vary depending on the severity of the disease, the presence of early diagnosis, and the availability of multidisciplinary care. Moreover, consanguineous marriages among affected families emphasize the significance of genetic counseling and early diagnosis in preventing the recurrence of this rare and debilitating disorder. Collaborative efforts among medical professionals, researchers, and patient advocates are pivotal in raising awareness, improving diagnostic approaches, and enhancing the overall quality of life for individuals and families affected by Wolman disease.

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