Acid sphingomyelinase deficiency: Burden of disease and real-world impact of enzyme replacement therapy on pediatric patients and caregivers

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BACKGROUND:

Acid Sphingomyelinase Deficiency (ASMD) is an ultra-rare autosomal recessive lysosomal storage disorder characterized by intracellular lipid accumulation in multiple organ systems resulting in significant impacts on morbidity and mortality. Olipudase alfa, an enzyme replacement therapy, was recently approved by several agencies for the treatment of the non-neurologic manifestations of ASMD. Studies demonstrate improvement in organomegaly, pulmonary function and lipid profiles with olipudase alfa, yet little is known about its impact on quality of life (QoL) for patients and caregivers.

Risks associated with olipudase alfa: Most parents/caregiver said in the survey that there were no disadvantages or adverse impacts on their child. Disadvantages mentioned in the survey included the treatment not crossing the blood-brain barrier, the child missing school on some days to receive the treatment and the demands and challenges of the clinical trial.

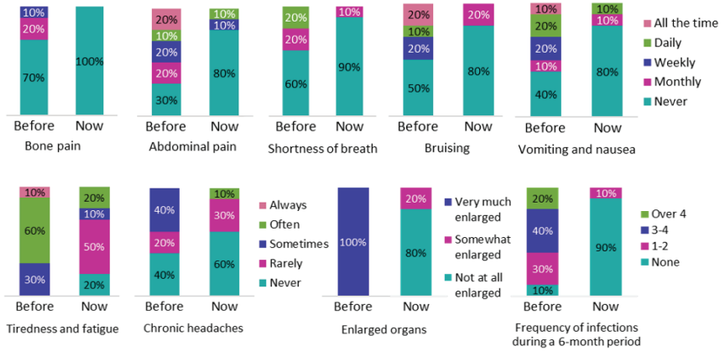

Figure 1. Frequency of ASMD symptoms before (n=10) and after (n=10) treatment with olipudase alfa.

OBJECTIVE:

The purpose of this study is to better understand the real-life impact of ASMD on pediatric patients and their caregivers and assess how olipudase alfa impacts their quality of life (QoL).

METHODS:

Pediatric patients (≤18 years of age) with a confirmed diagnosis of ASMD and receiving olipudase alfa for at least 12 months were recruited in early 2022 through national patient organizations to participate in a global online questionnaire followed by semi-structured interviews. Ten parents of patients with ASMD who had experience with olipudase alfa as an experimental therapy for pediatric patients participated in the study. Quantitative analysis of the results was undertaken. Interview transcripts were analyzed using an inductive thematic approach.

RESULTS:

Five themes emerged: (1) ASMD is a systemic disease with a wide array of manifestations that significantly impact quality of life; (2) Olipudase alfa was associated with improvements in all non-neurologic manifestations (figures 1-3); (3) Participants perceived the risk associated with olipudase alfa to be low, and benefits greatly outweighed any risk or burden (see text and figure 4); (4) Participants recognized an unmet need for a disease-modifying therapy to address the neurologic manifestations of the disease despite the benefits perceived by olipidase alfa in the management of non-neurological symptoms; (5) Participants felt all patients with ASMD need access to olipudase alfa based on the life-changing experience they perceived.

Olipudase alfa had a positive, sustained impact on virtually all non-neurologic domains that were deemed important by patients and caregivers. Based on a favorable risk/benefit profile, the patients and families felt strongly that the entire ASMD community should have access to this therapy. One parent said "My heart breaks for the parents whose children have ASMD and they're not in the trial and they're not receiving anything [...] honestly also feel guilty because your child is receiving this medicine and you have seen the benefits of it. And you know they wake up every day and they're just... Oh. It's just devastating. It is devastating. And this medicine can... It saved my child's life."

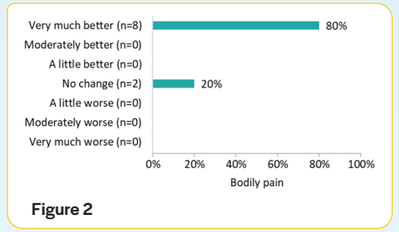

Figure 2

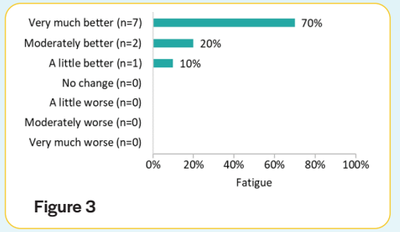

Figure 3

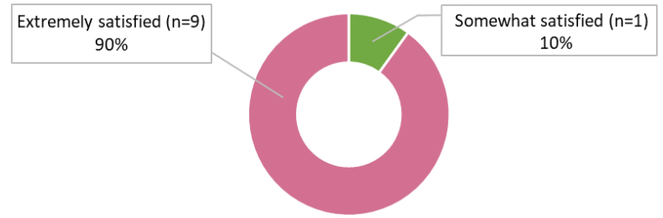

Figure 4. Level of satisfaction with olipudase alfa to treat ASMD (n=10).

CONCLUSION:

This study elucidated several key findings from this ultra-rare disease patient population that has not had access to a disease modifying therapy until recently. These findings include 1) the significant burden of disease; 2) the unmet need for patients and family living with ASMD; 3) the expectations and preferences of a treatment from the patient perspective; 4) the positive impact olipudase alfa had on patients and families over a prolonged period of time. This information is critical for patients, providers, regulators and payors as approval and access for this new therapy is being considered globally.

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