Meaningful Treatment Outcomes for Sanfilippo Syndrome: A Study of Caregiver Preferences and Prioritization

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INTRODUCTION

Sanfilippo syndrome (MPS III) is a degenerative lysosomal storage disorder, which has no approved therapies. Patient-focused drug development and the collection and integration of patient experience data into drug development and regulatory decision making have become priorities of the Food and Drug Administration (FDA). The current study explores caregiver perceptions and prioritization of which disease symptoms are most impactful to the child and family. By identifying the meaningful benefits that are desired from a non-curative therapy we aim to provide insight which will aid in patient-centered drug development across the stages of MPS III disease progression.

METHODS

- We used an innovative mixed-method approach with 25 caregivers of MPS III children ages 4 to 36 years-old from 17 U.S. states.
- We conducted 3 focus groups comprising three activities: (1) formative validity testing of a symptom/staging survey (not described here), (2) moderated exploration of burden and meaningful treatment benefit, and (3) best-worst scaling (BWS) activities to quantify the relative importance of twelve treatment benefits, which arose during activity 2 and thus varied across focus groups.
- Thematic analysis revealed common themes and quantitative analysis used 'best-worst' scoring to prioritize meaningful benefits from most to least important.

Figure 1: Example of BWS Question

Table 1: Sanfilippo Syndrome Patient Demographics (oldest child with Sanfilippo Syndrome)

Children with Sanfilippo		
Age Range (years)	(4 - 36)	
Median Age (years)	8	
	Count	%
Sanfilippo Sub-Type		
Type A	17	68%
Type B	6	24%
Type C	2	8%
Participated in Clinical Trial	5	20%

Table 2: Caregiver Participant Demographics

Caregiver Participants		
Median Age (years)	38	
	Count	%
Relationship to child		
Biological Parent	24	96%
Step-parent	1	4%
Sex		
Female	19	76%
Male	6	24%
Race/Ethnicity		
White	23	92%
More than 1 race	2	8%

RESULTS

- 25 caregiver participants across 3 focus groups. See Tables 1 and 2 for demographic data of participants and their children.

Qualitative Results

- Caregivers' experiences reflect uncertainty and distress related to progression and increased family burden with progressing symptoms.
- Participants expressed a willingness to "try anything" to slow or stop progression.
  - "But if something was just slow down the progression. If something just eased the suffering. If something just Helped them sleep,. If something just made them be able to eat normally. Like we- our expectations in what we would like to get from treatments for Sanfilippo are relatively small. So it's cause some of those small things have a big impact on us. " (FG3)
- Participants identified multiple themes of symptoms as meaningful to treat (see Table 3).

Quantitative Results

- For their children, focus group 1 (Fig.2) prioritized addressing communication (relative importance score=.50), pain (score=.35), and child unhappiness (score=.33); group 2 (Fig.3) prioritized communication (score=.58), frustration (score=.33), and aggressive behavior (score=.31); and group 3 (Fig.4) prioritized communication (score=.50), pain (score=.48), and sleep (score=.23).

Figure 2: BWS results for Focus Group 1. Note that items with lower priority scores do not reflect items that are unimportant. Rather, they are items that parents mark as less important among a highly-relevant list of symptoms.
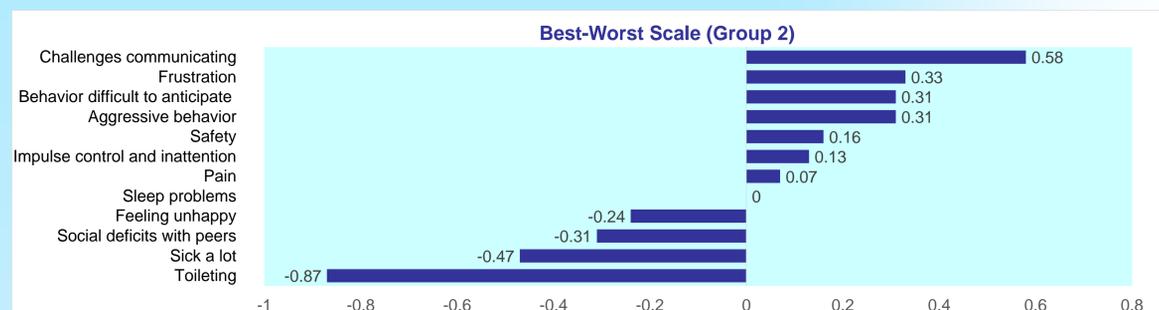

Figure 3: BWS results for Focus Group 2. Note that items with lower priority scores do not reflect items that are unimportant. Rather, they are items that parents mark as less important among a highly-relevant list of symptoms.
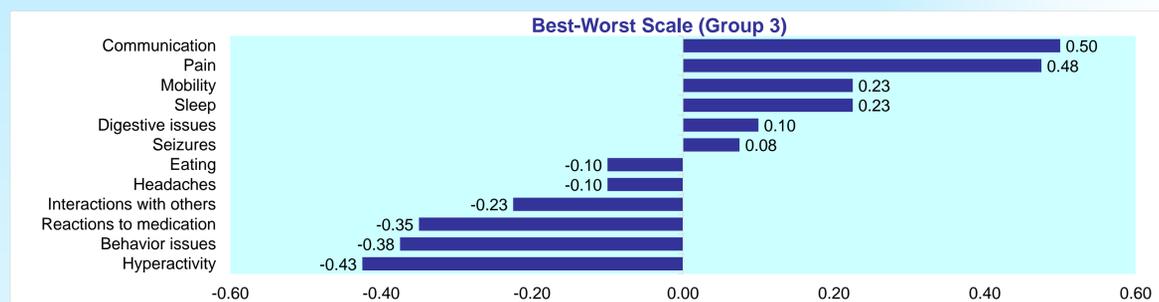

Figure 4: BWS results for Focus Group 3. Note that items with lower priority scores do not reflect items that are unimportant. Rather, they are items that parents mark as less important among a highly-relevant list of symptoms.

Table 3: Themes arising from focus groups

Themes
Communication and Relationships
Communication
Social Deficits with Peers
Cognitive and Behavioral
Frustration/Impulse Control/Aggressive Behaviors
Hyperactivity
Safety
Wellbeing and Health
Feeding
Sleep problems
Anxiety/Unhappiness in Child
Digestive Issues and Toileting
Illness/vulnerability to illness
Seizures
Pain/Headaches (and Concern about Pain)
Mobility

CONCLUSIONS

Among a group of relevant symptoms which were identified by caregivers, parents prioritized communication, pain, child's unhappiness, frustration and mobility as most important symptoms to be addressed with a potential treatment for MPS III. Caregivers indicated that even modest treatment benefits would be highly valued. Ongoing data collection via an online quantitative survey will elicit broader input from the MPS III caregiver community to build upon current insights. Findings from this will inform regulatory bodies and industry regarding endpoint selection across a range of disease stages linked to caregiver preferred treatment benefits.

ACKNOWLEDGEMENTS