Management of US boys and girls with hemophilia B: Caregiver insights from the bridging hemophilia B experiences results and opportunities into solutions (B-HERO-S) study

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Objective

- The B-HERO-S study was designed to better understand the clinical presentation and management of children with mild, moderate, or severe hemophilia B (CWH).

Introduction

- The global HERO (Hemophilia Experiences Results and Opportunities) program initiated in 2009, sponsored by Novo Nordisk, sought to investigate the psychosocial issues impacting persons with hemophilia (PWH) and those that care for and support them.[1,2]
- The B-HERO-S study was conducted in caregivers (CG) of CWH and had the potential to include caregivers of girls with hemophilia.

Methods

- The B-HERO-S survey was conducted in the United States from 24 September 2015 to 3 November 2015, as a one-time participation in an online one-hour internet-based Independent Review Board-approved survey.
  - CGs (>18 years of age, non-parents allowed) of children <18 years of age with mild, moderate or severe hemophilia B were identified via three advocacy organizations (National Hemophilia Foundation, Hemophilia Federation of America and Coalition for Hemophilia B).
  - Participants completed an electronic case report form consisting of approximately 100 multiple choice questions, including some questions that were contingent on prior answers.
- Descriptive statistical analyses were performed on the full analysis set, which included questionnaires of all participants who had completed the survey.

Results

- Characteristics of the 150 CGs who completed the survey and their oldest CWH are shown in **Table 1**.

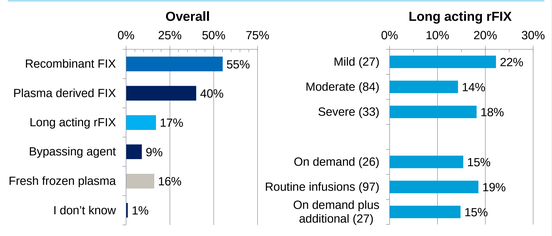
Table 1 Demographics of caregivers and their oldest CWH

	CG (n=150)	CWH (n=150)
Age, years		
Median	35	10
Min, Max	21, 53	<1,18
Gender, n (%)		
Male	34 (23%)	121 (81%)
Female	116 (77%)	29 (19%)
Hemophilia severity, n (%)		
Mild		27 (18%)
Moderate		84 (56%)
Severe		33 (22%)
Inhibitor		6 (4%)

n: number of respondents, %: percentage of respondents.

- Recombinant and plasma derived factor IX (FIX) were the most common replacement therapies for CWH (55% and 40%, respectively); see **Figure 1**. Plasma derived FIX was more common in moderate hemophilia (52%); fresh frozen plasma was most common in severe hemophilia.
- CWH with mild, moderate or severe hemophilia also used long acting FIX (17%) for on demand and prophylactic treatment (**Figure 1**).

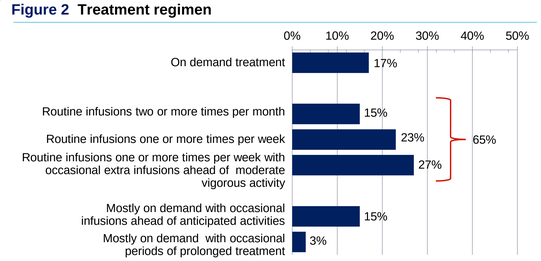
Figure 1 Type of product



FIX: factor IX; rFIX: recombinant FIX. Numbers in parentheses refer to number of respondents.

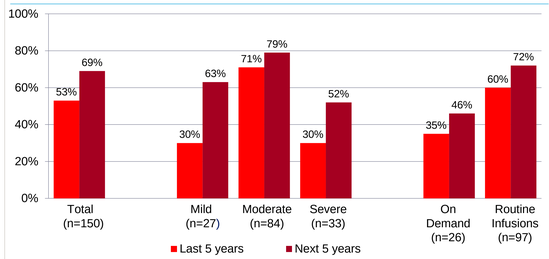
- Most (65%) CWH received routine infusions with replacement factor to prevent bleeding (prophylaxis), either 2 or more times a month or 1 or more times a week (with or without extra infusions ahead of activity) (**Figure 2**).
- When analyzed by severity and inhibitor status, 66–70% of CWH with moderate or severe hemophilia or inhibitors received routine infusions, while only 25% of CWH with mild hemophilia received routine infusions.
- Overall, 39% of CWH received routine infusions >50% of their lifetime. When analyzed by hemophilia severity, 18–31% of CWH with mild or moderate hemophilia and 75% of CWH with severe hemophilia received routine infusions >50% of their lifetime.

Figure 2 Treatment regimen



- Approximately half (53%) of the CGs had difficulties obtaining replacement factor in the past 5 years or concerns about the availability or affordability (**Figure 3**). Commonly reported difficulties included lack of supply and could not personally afford co-payments.
- Most (69%) of the CGs had concerns about the ability to obtain replacement factor in the next 5 years or about availability or affordability; see **Figure 3**.

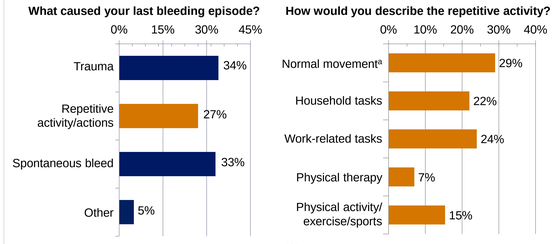
Figure 3 Issues with access to factor due to availability or affordability in the last and next 5 years



Numbers in parentheses refer to number of respondents.

- Regarding the number of bleeds in the last 12 months, caregivers said children with mild or moderate hemophilia had a median of 3 bleeds, severe had 5 bleeds, and CWH with inhibitors had 8 bleeds (overall median=3).
- When analyzed by treatment regimen, CWH receiving on demand treatment had the same number of bleeds as CWH receiving routine infusions (median=3 for each). CWH receiving mostly on demand treatment with occasional extra or routine doses had slightly more bleeds (median=5). The median perceived disease control was 8 out of 10, where 10 was 'extremely well-controlled'.
- The majority (67%) of CGs said their child's most recent bleed was within the last 4 weeks. The cause of their last bleed was mostly due to trauma, repetitive activity or actions, or were spontaneous, see **Figure 4**.
- The repetitive activity leading up to a bleed was most often described as normal movement (i.e., walking, stairs, in/out bed) (29%), work-related tasks (24%) or household tasks (22%) see **Figure 4**.

Figure 4 Last bleeding episode



[a]Normal movement: walking, stairs, in/out bed.

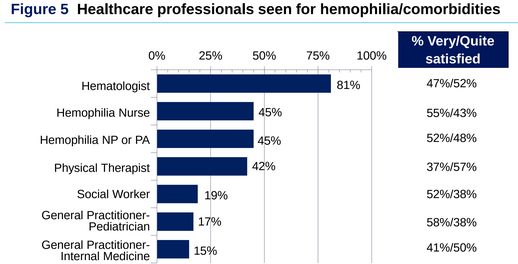
- Most (78%) caregivers said their child did not have a specific joint that bled more than another. Over 50% of caregivers were tracking their child's bleeds with an electronic diary or worksheet.
- CGs reported that children with moderate hemophilia had a median of 3 hemophilia treatment center (HTC) visits in the past year, those with mild or severe had 5 visits, and CWH with inhibitors had 12 visits (overall median=4). However, 13% of CWH did not go to an HTC in the last 12 months.
- Most (90%) CGs reported very easy or quite easy access to the HTC. Those who found it difficult cited the following barriers: long distance (50%), time (43%), and expense of travel (43%).

Conclusions

- While 55% of CWH received treatment with rFIX and 17% received extended half-life rFIX, a surprising 40% of CWH received plasma derived factor IX, suggesting potential knowledge gaps, affordability issues or preference.
- Bleeding rates and HTC visit frequency may suggest that children with mild or moderate hemophilia who have a worse phenotype or are engaged in routine activities and sports that increase the risk of bleeding are more likely to treat with routine infusions.
- CG of CWH with moderate hemophilia and those taking routine infusions perceived greater issues with access to factor due to availability or affordability.

- Over 50% of CG had the responsibility for hemophilia care. There was little difference when analyzed by hemophilia severity (78–88%).
- Typically the CG, a family member, or the CWH themselves administered the infusions (73%); less commonly infusions were performed by a nurse (27%, either at home or at the HTC). Treatment was mostly administered at home (32%) or at the HTC/hospital (35%); few said infusions were always performed at the hospital or HTC (5%).
- CWH commonly saw hematologists (81%), nurse practitioners/physician's assistants (45%), nurses (45%), and physiotherapists (42%), for hemophilia treatment or complications related to treatment (HIV/HCV, joint disease); see **Figure 5**.
- Most CGs were very or quite satisfied with the advice and support offered by each of the healthcare professionals their CWH had seen (**Figure 5**).

Figure 5 Healthcare professionals seen for hemophilia/comorbidities



HCP: healthcare professional; NP: nurse practitioner; PA: physician's assistant

References

1. Forsyth AL, et al. Patient Prefer Adherence 2015 Oct 29;9:1549-60.
2. Witkop M, et al. Am J Hematol 2015 Dec;90 Suppl 2:S3-10.

Conflict of interest disclosure

All authors have potential conflicts of interest. Please refer to the abstract.

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B-HERO-S
Bridging Hemophilia B Experiences Results Opportunities to Solutions