Measuring work or school absence associated with administration of factor concentrate in children with hemophilia in the United States – Hemophilia Utilization Group Study Part V (HUGS V)

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INTRODUCTION

- Hemophilia is inherited condition, requiring expensive, lifelong treatment, and significantly impacts many aspects of a patient and his/her family's life [1].
- Children with hemophilia and their parents/caregivers are at increased risk for school and work absence respectively, as they attend the child's hemophilia-related needs, including factor concentrate administration [2].
- Excessive school absence may compromise children's academic performance and future career. Excessive work absence may have important work productivity and economic implications [2].
- However, there is little data on how differing modes of factor administration impacts school and work absence.

OBJECTIVE

- To assess the impact of the mode of factor concentrate administration (self-infuse, parents/caregivers infuse or healthcare provider infuse) on work or school absence among children with hemophilia and their parents/caregivers.

METHODS

- Data were obtained from The Hemophilia Utilization Group Study (HUGS), which evaluates the cost and burden of illness among persons with hemophilia A and hemophilia B who obtained comprehensive care at Hemophilia Treatment Centers (HTCs) in the United States.
- 97 children ages 7-17 years were included in this study (children ages 2-6 years were excluded because no one self-infused). Either children themselves or parents of children answered questions regarding socio-demographic characteristics, treatment pattern and quality of life.
- The most common mode of factor administration (self, family member, clinic staff, visiting nurse or emergency room) was extracted from patients' clinic records at the initiation of the study.
- Data on days missed from work or school and the number of bleeding episodes were collected at 8 time points during 24 months period. This analysis included all subjects who completed at least two follow-ups.
- Descriptive statistics were calculated using Chi-square tests for categorical variables and Kruskal-Wallis tests for continuous variables. Fisher Exact tests were performed when one or more subgroups had an expected frequency of 5 or less.
- Negative binomial regression was used to assess the association between work or school absence and the mode of factor administration among children age 7-17 years. Two separate models were conducted for children or parents/caregivers.

Table 1: Baseline characteristics by mode of factor administration

Characteristics	Total	Self-infuse	Parent/Family	Healthcare provider[a]	P value
N, (%)	97	11 (12)	66 (69)	20 (19)	
Type of disease, N (%)					**0.02**
Hemophilia A	48 (51)	9 (82)	33 (50)	6 (30)	
Hemophilia B	49 (49)	2 (18)	33 (50)	14 (70)	
Mean age (SD), years	11.3 (3.1)	15.3 (2.1)	10.6 (2.7)	11.4 (3.1)	**<0.0001**
Race: White, N (%)	61 (63)	5 (45)	41 (62)	15 (75)	0.26
Education[b]: >12 years, N (%)	64 (66)	8 (73)	43 (65)	13 (65)	0.88
Disease severity, N (%)					**<0.0001**
Mild/Moderate	40 (41)	0 (0)	24 (36)	16 (80)	
Severe	57 (59)	11 (100)	42 (64)	4 (20)	
Treatment regimen, N (%)					**<0.0001**
Prophylaxis	49 (52)	8 (73)	40 (62)	1 (6)	
On-demand	45 (48)	3 (27)	25 (38)	17 (94)	

[a] Healthcare provider includes visiting nurse, clinic staff and emergency department. [b] Represent education level of parents of children.
Note: the percentage indicated column percentage.

Figure 1: Mode of factor administration by age

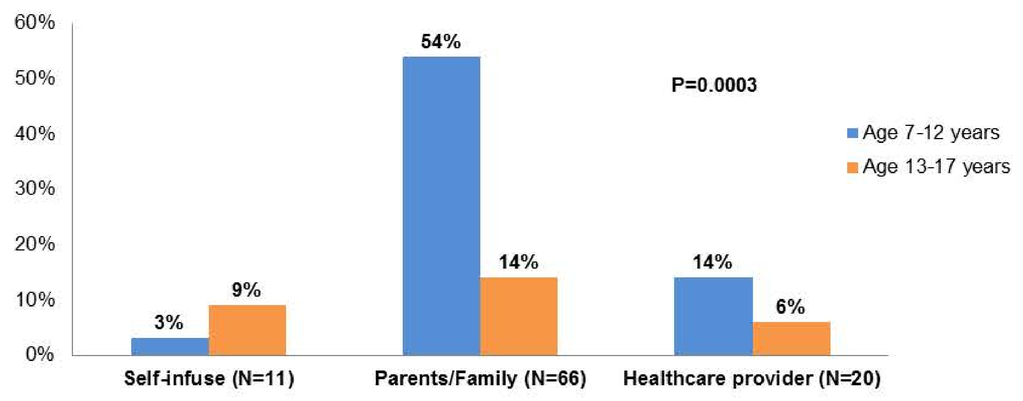
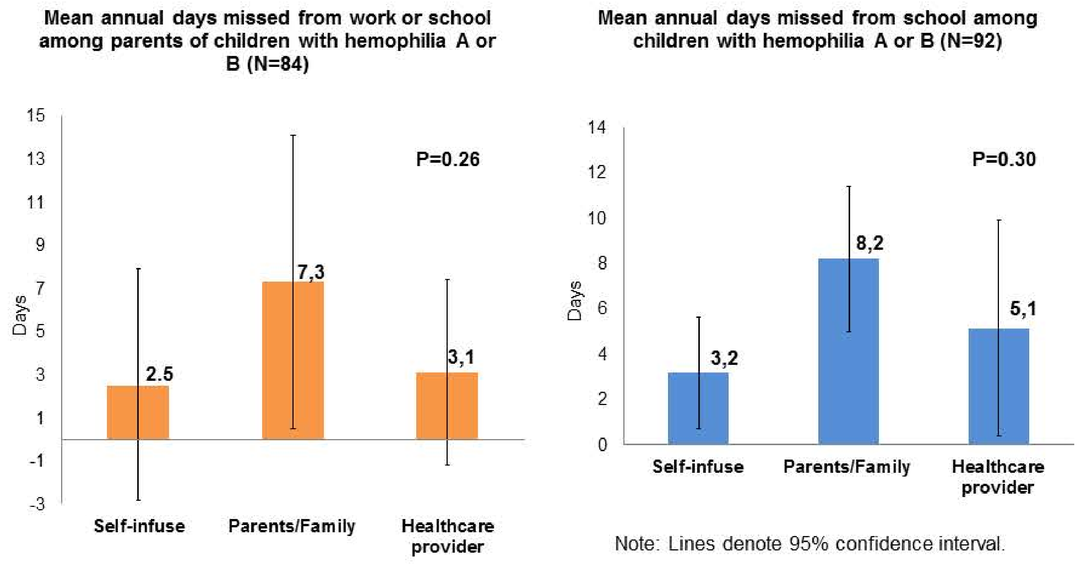


Figure 2: Comparison of mean work or school absence by mode of factor administration

Table 2: Association between work/school absence for parents/children and the mode of factor administration in children

Variables	Work or school absence in parents (N=84)			School absence in children (N=92)		
	IRR	95% Confidence Limits	P value	IRR	95% Confidence Limits	P value
Mode of infusion						
Parent/Family	2.62	0.95-7.25	0.06	2.72	1.06-6.94	**0.04**
Healthcare provider	4.28	1.20-15.25	**0.03**	4.03	1.27-12.8	**0.02**
Self-infusion	1.00	-	-	1.00	-	-
Age						
13-17 years	0.65	0.31-1.36	0.25	0.62	0.32-1.20	0.15
7-12 years	1.00	-	-	1.00	-	-
ABR	1.04	1.01-1.07	**0.02**	1.04	1.01-1.08	**0.01**
Severe disease	0.86	0.30-2.49	0.79	0.86	0.32-2.31	0.77
Prophylaxis therapy	2.69	0.94-7.67	0.06	2.93	1.12-7.61	**0.03**

Abbreviation: IRR=incidence risk ratio; ABR=annual bleeding rate. Note: data presented the results from negative binomial model. Only patients with complete data was included in the regression.



Note: Lines denote 95% confidence interval.

RESULTS

- Participants with hemophilia A comprised 51% (N=48) of the included study sample. Among all participants, 57 (59%) had severe disease and 49 (52%) received prophylactic therapy.
- The most common mode of factor administration was with the help of a family member (69%), followed by infusion by a healthcare provider (19%), and self-infusion (12%) (Table1).
- A significantly greater percentage of participants with severe hemophilia self-infused factor or were infused by a family member, compared to those with mild/moderate disease (93% vs. 60%) ($p<0.0001$). Patients treated with prophylactic therapy were more likely to self-infuse (16%) or depend on a family member (81%), rather than be administered factor by a healthcare provider (3%) ($p<0.0001$) (Table 1).
- The percentage of patients who self-infused increased with patient age, while the proportion infused by a healthcare provider decreased with age ($p<0.0001$) (Figure 1).
- Mean annual missed days from work or school among parents were 2.5±7.5, 7.3±25.6 and 3.1±8.0, among children who self-infused, were infused by a family member or by a healthcare provider, respectively ($p=0.26$). Mean annual missed days from school among children were 3.2±3.4, 8.2±12.6 and 5.1±9.8 accordingly ($p=0.30$) (Figure 2).
- Among school-age children (7-17 years of age), compared to those who self-infused, parents' annual days missed from work/school was 2.62 ($p=0.06$) and 4.28 ($p=0.03$) times greater among those who infused by a family member or healthcare provider, respectively, after controlling for age, disease severity, treatment regimen and annual bleeding frequency (Table 2). Similar trends were observed for days missed from school among children with hemophilia, as shown in Table 2.

CONCLUSIONS

- Hemophilia is a chronic condition posing burden upon both patients and families. Both children with hemophilia and parents experience a significant amount of missed days from work or school due to many factors including administration of factor.
- Missed days from work or school among both children and parents were significantly lower among those who administered factor by self-infusion, as compared to those who infused by a family member or a healthcare provider.
- The contribution of self-infusion to reducing work and school absence should be stressed as a benefit to eligible children and their caregivers.
- Limitation: Mode of factor administration was extracted from clinical record at baseline. Changes in mode of factor administration were not recorded. Patients may actually administer factor using multiple modes, while in this analysis, the one used most frequently was assigned for each patient, which may underestimate the actual numbers in each subgroup of factor administration.

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