

Preference-based Measures of Health-related Quality of Life for Adults with Severe Haemophilia: Implications for the Cost-effectiveness of Prophylaxis

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OBJECTIVES

Is prophylaxis for people with haemophilia cost-effective? To answer that question, one needs estimates of quality-adjusted life-years (QALYs) for patients with haemophilia under different treatment regimens. That requires assessing health-related quality of life (HRQL) using a preference-based measure relative to death (=0) and optimal health (=1). We summarize published estimates of QALY weights for people with haemophilia, identify gaps in research, and discuss implications for estimates of cost-effectiveness of prophylaxis.

METHODS

Eleven studies published from 1999 through 2013 reported preference based HRQL scores for people with haemophilia. Two studies used the Standard Gamble method of direct utility elicitation and nine studies used indirect utility elicitation with generic instruments such as EuroQol (EQ-5D), Health Utilities Index (HUI2 and HUI3)

RESULTS

- Mean HRQL scores are as much as 20% lower for adults with severe hemophilia than for adults with mild-moderate haemophilia without prophylaxis; controlling for confounding by HIV infection reduces difference to maybe 10%.
- If prophylaxis eliminates differences in HRQL by severity prophylaxis is likely cost-effective. However, differences in HRQL by severity are found even among those on primary prophylaxis, 12% lower for severe haemophilia in one study from the Netherlands.
- Large differences in mean EQ-5D scores are reported among hemophilia patients across countries, highest in Sweden, which pioneered life-long primary prophylaxis, and the Netherlands.

Table 1: Review of QALY weights in hemophilia

Reference	Country	Utility elicitation technique	On demand QALY Weights	Prophylaxis QALY Weights
Naraine et al. 2002	Canada	SG	General population – 0.825 Adult patients – 0.895 Parents – 0.915	General population – 0.950 Adult patients – 0.955 Parents – 0.985
Wasserman et al. 2005	USA	SG and VAS	• Mild Adults – 0.884 Pediatrics – 0.936 • Moderate Adults – 0.868 Pediatrics – 0.907 • Severe Adults – 0.810 Pediatrics – 0.868	• Severe Adults – 0.799 Pediatrics – 0.872
Miners et al. 1999	UK	EQ-5D and SF-36	Mild/Moderate – 0.85 Severe – 0.66	-
Tripoli et al. 2001	Italy	EQ-5D and SF-36	Age 15-30 yrs – 0.81 Age 31-45 yrs – 0.70 Age >= 45 yrs – 0.49	-
Noone et al. 2011	4 European countries	EQ-5D	100% of lifetime on on-demand therapy - 0.72	Lifetime primary prophylaxis – 0.88 50% of lifetime on prophylaxis – 0.77 < 50% of lifetime on prophylaxis – 0.72
Noone et al. 2013	6 European countries	EQ-5D	100% of lifetime on on-demand therapy - 0.619	Lifetime primary prophylaxis – 0.866 50% of lifetime on prophylaxis – 0.812 < 50% of lifetime on prophylaxis – 0.755
den Uijl et al. 2013	Netherlands	EQ-5D	-	Moderate patients (lifetime prophylaxis) – 0.92 Severe patients (lifetime prophylaxis) – 0.8
Fischer et al. 2013	Netherlands & Sweden	EQ-5D	-	Severe patients (lifetime prophylaxis) - 0.88 (Dutch) - 0.86 (Sweden)
Neufeld et al. 2012	USA	EQ-5D	-	-
Barr et al. 2002	Canada	HUI2 and HUI3	Mild/Moderate patients HIV+ = 0.83 Severe patients HIV+ = 0.67	HIV - = 0.86 HIV - = 0.80
Lippert et al. 2005	4 European countries	SF-6D	Age <=30– 0.73 Age >= 30– 0.66	Age <=30– 0.76 Age >=30– 0.68

Table 2: Generic preference based instruments

Reference	Instrument	Dimension	Valuation	Strength	Weakness
Devlin NJ et al. 2013	EQ-5D (EuroQol – 5D)	Mobility, self-care, usual activities, pain/discomfort, anxiety/depression	VAS, TTO, ranking	- Preferred for populations with more severe problems.	Ceiling effects Does not have dimensions for particular impairments.
Feeny et al. 2002	HUI3 (Health Utilities Index-3)	Vision, hearing, speech, ambulation, dexterity, emotion, cognition, pain	VAS transformed to SG	- Performs better for people with sensory problems.	Does not examine role or social function.
Torrance et al. 1996	HUI2 (Health Utilities Index - 2)	Sensory, mobility, emotion, cognitive, self-care, pain, fertility	VAS transformed to SG	- Only generic instrument designed for use in children.	- Little evidence on validity.
Brazier et al. 1998, Brazier and Roberts 2004	SF-6D	Physical functioning, role limitation, social functioning, pain, energy, mental health	SG, ranking	- Preferred for populations with mild problems.	- Floor effects. - Does not have dimensions for particular impairments.

CONCLUSIONS

Differences in HRQL by current prophylaxis status cannot be used to assess cost-effectiveness of prophylaxis. To assess the cost-effectiveness of prophylaxis, better estimates of HRQL in severe haemophilia are needed based on models of disease progression and information on the effects of joint disease, liver disease, pain, and activity limitations on HRQL.

REFERENCES

- Naraine VS, Risebrough NA, Oh P, et al. Health-related quality-of-life treatments for severe haemophilia: utility measurements using the Standard Gamble technique. *Haemophilia*. 8, 112–20 (2002).
- Wasserman J, Aday LA, Begley CE, Ahn C, Lairson DR. Measuring health state preferences for hemophilia: development of a disease-specific utility instrument. *Haemophilia*. 11, 49–57 (2005).
- Miners AH, Sabin CA, Tolley KH, et al. Assessing health-related quality-of-life in individuals with haemophilia. *Haemophilia*. 5, 378–85 (1999).
- Tripoli S, Vaiani M, Linari S, Longo G, Morfini M, Messori A. Multivariate analysis of factors influencing quality of life and utility in patients with haemophilia. *Haematologica*. 86, 722–8 (2001).
- Noone D, O'Mahony B, Prihodova L. A survey of the outcome of prophylaxis, on-demand or combined treatment in 20–35 year old men with severe haemophilia in four European countries. *Haemophilia*. 17, e842–3 (2011).
- Neufeld EJ, Recht M, Sabio H, et al. Effect of acute bleeding on daily quality of life assessments in patients with congenital hemophilia with inhibitors and their families: observations from the dosing observational study in hemophilia. *Value Health*. 15, 916–25 (2012).
- Noone D, O'Mahony B, van Dijk JP, Prihodova L. A survey of the outcome of prophylaxis, on-demand treatment or combined treatment in 18–35-year old men with severe haemophilia in six countries. *Haemophilia*. 19, 44–50 (2013).
- den Uijl I, Biesma D, Grobbee D, Fischer K. Turning severe into moderate haemophilia by prophylaxis: are we reaching our goal? *Blood Transfus*. 11, 364–9 (2013).
- Fischer K, Steen Carlsson K, Petroni P, et al. Intermediate-dose versus high-dose prophylaxis for severe hemophilia: comparing outcome and costs since the 1970s. *Blood*. 122(7), 1129–36 (2013).
- Barr RD, Saleh M, Furlong W, et al. Health status and health-related quality of life associated with hemophilia. *Am J Hematol*. 71, 152–60 (2002).
- Lippert B, Berger K, Berntorp E, et al. Cost effectiveness of haemophilia treatment: a cross-national assessment. *Blood Coagul Fibrinolysis*. 16, 477–85 (2005).

