Health-related Quality of Life and Productivity/Activity Impairment in Patients with Transfusion Dependent β-thalassaemia in the UK NHS: Data from a UK Multicentre Observational Study

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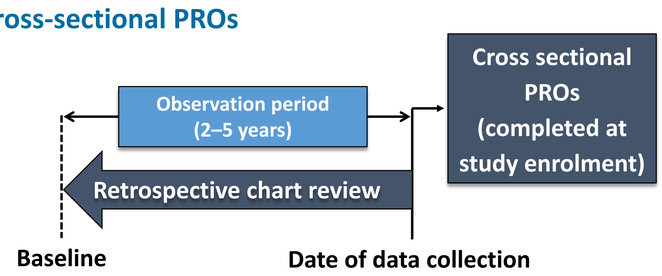
INTRODUCTION

- β-thalassaemia is an inherited blood disorder that results in defects in haemoglobin (Hb) synthesis.[1]
- The most severe forms of β-thalassaemia require chronic transfusion therapy to sustain life (transfusion-dependent thalassaemia [TDT]).[2]
- Long-term blood transfusion therapy causes iron overload; regular monitoring of iron burden and iron chelation are essential to reduce the risk of complications.
- There is a paucity of real-world data concerning the management of patients with TDT in the United Kingdom (UK) and their self-reported quality of life (QoL).

STUDY DESIGN

Figure 1. Study design; retrospective chart review with cross-sectional PROs



- A multicentre, observational study was conducted in 9 centres in the UK; the study involved retrospective data collection and cross-sectional patient reported outcome (PRO) questionnaires (completed at enrolment). The study design is shown in **Figure 1**.
- The observation period was defined as the five year period prior to the date of data collection/death **or**; for patients with a diagnosis of TDT between two to five years prior to the date of data collection/death, the observation period was from the date of diagnosis of TDT to the date of data collection.
- Baseline was defined as the start of the patient's observation period.

METHODS

Study patients

- Inclusion criteria:
  - Patients with a documented diagnosis of TDT ≥2 years prior to data collection. This study defined transfusion dependence as β-thalassaemia treated with ≥8 transfusions during the first year of chronic transfusion therapy or a history of at least 100 mL/kg/year of packed red blood cells.
- Exclusion criteria:
  - Patients who had undergone allogeneic hematopoietic stem cell transplant (aHSCT), except those who had disease recurrence post-transplant who were receiving transfusion therapy and meet the definition of TDT.
  - Living patients for whom written informed consent had not been obtained
  - Patients with <2 years of continuous data available prior to data collection.
  - Patients participating in any clinical trial during the study observation period.
  - Patients with any significant mental or English language incapacity that would have prevented them from participating in the survey.

Data source

- Validated PRO questionnaires were completed by eligible patients at enrolment. The number of patients completing each PRO along with the PRO version completed are shown in **Table 1**.

Statistics

- Distributions and descriptive statistics of central tendency (mean or median) and dispersion (standard deviation [SD] or interquartile range [IQR]) were calculated for quantitative variables. Nominal variables were described with frequencies and percentages.
- The total n included in each analysis is reported in brackets.

METHODS CONTINUED

Table 1. PROs completed at enrolment, by patient group

Questionnaire		Adult patient (>18 years)	Child patient (aged 7-18 years)	Child patient (<7 years of age)
EQ-5D-3L	version	EQ-5D-3L*	EQ-5D-Y **	EQ-5D-Y proxy†
	n	98	20	10
TranQoL	version	TranQoL adult	TranQoL child	TranQoL proxy†
	n	94	27	13
WPAI-SHP‡	version	WPAI-SHP‡	None	None
	n	88		

*Patients aged ≥16; **Completed by child aged 8–15 years; †Completed by parent/carer for child aged 4-7 ; ‡Work productivity and activity impairment - specific health problem, completed by patients aged ≥18 years.

- The EQ-5D-3L[3] utility score ranges from 1.00 (perfect health) to <0 (death). The EQ-5D visual analogue scale (VAS) asks patients to rate health from 0 (worst imaginable) to 100 (best imaginable). The EQ-5D-Y measures the same domains as the EQ-5D-3L, and is worded more suitably for completion by children.
- The TranQoL[4] is a thalassaemia-specific questionnaire to measure QoL in TDT patients, assessing health in 5 domains (physical, emotional, sexual, family and school/career health). Scores range from 0 to 100; higher scores indicate higher QoL.
- The WPAI-SHP[5] measures work productivity over the 7 days prior to completion, including absenteeism (work time missed), presenteeism (reduced working effectiveness), total productivity loss and activity impairment.

RESULTS

- Here we report the results from PRO questionnaires; outcomes assessed during the observation period will be reported separately.
- Of 165 study patients included in the retrospective chart review, 121 completed ≥1 PROs (excluding proxy).

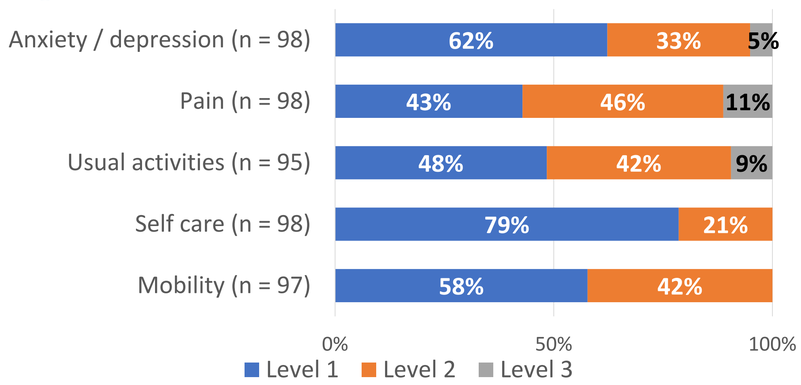
EQ-5D VAS results

- The median (IQR) EQ-5D VAS scores were:
  - 70.0 (54.5 to 80.0) for patients aged ≥16 years (n=95)
  - 80.0 (57.5 to 90.5) for patients aged 8–15 years (n=20)
  - 85.0 (62.5 to 98.0) for patients aged 4–7 years (n=10)

EQ-5D (adults aged ≥16 years)

- Patients aged ≥16 years completing the EQ-5D-3L had a median age of 30.9 (IQR 24.2 to 40.7) years.
- The mean EQ-5D-3L utility score (patients aged ≥16 years) was 0.69 (SD 0.33; n=94).The domain score distributions are shown in **Figure 2.**

Figure 2. Distribution of EQ-5D domain scores



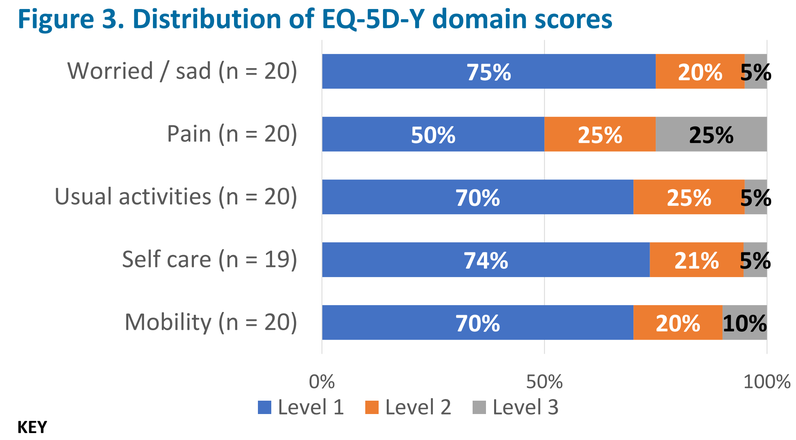
KEY

Level 1 = No problems (all domains); level 2 = some problems (mobility, self care, usual activities) *or* moderate (pain, anxiety/depression); level 3 = confined to bed (mobility), unable to perform (self care, usual activities), extreme (pain, anxiety/depression)

EQ-5D-Y (patient completed, aged 8–15 years)

- The results from the EQ-5D-Y domains are shown in **Figure 3**.

Figure 3. Distribution of EQ-5D-Y domain scores



KEY

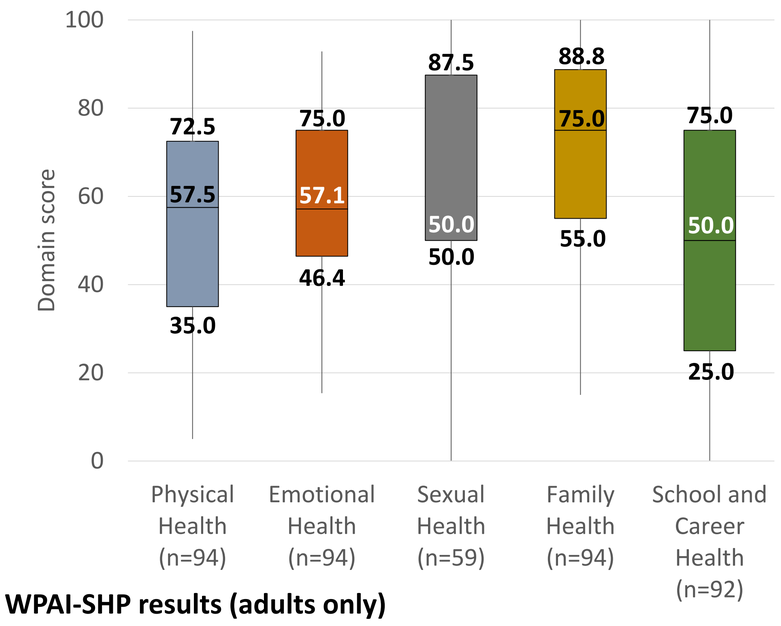
Level 1 = No problems (all domains); level 2 = some problems (mobility, self care, usual activities, pain) *or* a bit (anxiety/depression); level 3 = a lot (mobility, self care, usual activities, pain), very (anxiety/depression)

RESULTS CONTINUED

TranQoL results

- The median (IQR) TranQoL scores were:
  - 58.5 (44.4 to 74.0) for adults aged >18 years (n=94).
  - 82.1 (66.4 to 85.7) for patients aged 7–18 years (n=27).
  - 77.7 (74.1 to 88.0) for children under 7 years (n=13).
- The TranQoL median domain scores (in adults) are shown in **Figure 4**.

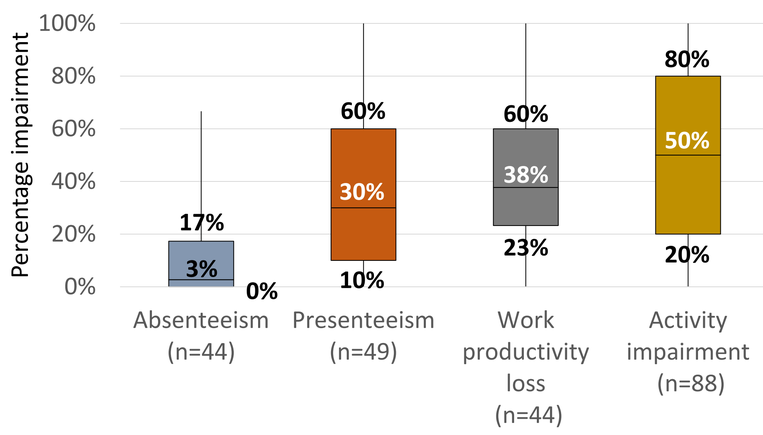
Figure 4. TranQoL domain scores (age >18 years only)



WPAI-SHP results (adults only)

- The results from the WPAI-SHP are shown in **Figure 5**.
- The highest impact was on activity impairment, with a median of 50% (IQR 20% to 80%).

Figure 5. WPAI scores (age >18 years only)



CONCLUSIONS

- Our results indicate that TDT has a substantial impact on patients' health-related quality of life.
- The EQ-5D for adults showed a notable decrease in utility score (0.69 [SD 0.33]) compared to population norms (0.93)[6]. The results also showed that several domains were adversely affected, including pain, usual activities, and mobility.
- The TranQoL showed impact on all domains, with the largest effect in the school and career health domain.
- The WPAI results suggest that activity impairment (50%) may be comparable to or higher than reported in other chronic conditions, e.g. chronic obstructive pulmonary disease (13–65%), rheumatoid arthritis (33%)[7].
- The analysis relied on the completeness of the answers provided by participants. Further, any patient or caregiver reported data based on recall was subject to recall bias.

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DISCLOSURES

KR declares advisory boards for bluebird bio and Pfizer, and educational grant from Novartis; SP declares advisory board and sponsorship to attend educational meeting (Celegene); PT declares advisory committee (Global Blood Therapeutics, Novartis, bluebird bio), data monitoring committee (Pfizer), clinical trial activity (Apopharma, Celgene, Global Blood Therapeutics, Novartis, Napp Pharma), investigator led funding (Kyowa Kirin Limited, bluebird bio) and speaker activity (Apopharma, Terumo plc); FS declares advisory board (silence therapeutics, Roche, Novartis), clinical safety committee (Abfero pharmaceuticals) and steering committee for trial (Celgene) involvement; JK declares advisory boards with Celgene, Jazz and Novartis; SP declares Novartis support to attend educational meetings; RW states nothing to declare; MV declares advisory board for bluebird bio; EC declares consultancy fees from Novartis; JH is an employee of OPEN VIE (formerly pH Associates); CP and MJ are employees of bluebird bio and own stock in the company.

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