Comprehensive patient care improves quality of life in transfusion dependent patients with β-thalassemia

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ABSTRACT

الأهداف: دراسة مستويات جودة الحياة لدى مرضى الثلاسيميا في مركز أمراض الدم الوراثية بالمدينة المنورة، المملكة العربية السعودية.

الطريقة: أُجريت هذه الدراسة المقطعية في مركز أمراض الدم الوراثية، مستشفى الأطفال والولادة، المدينة المنورة، المملكة العربية السعودية خلال الفترة من مايو إلى سبتمبر 2012م. وشملت الدراسة 43 من مرضى الثلاسيميا الذين يعتمدون على نقل الدم، بالإضافة إلى 43 من الأشخاص الأصحاء. ولقد قمنا باستخدام استبيان جودة الحياة المختصر التابع لمنظمة الصحة العالمية من أجل المقارنة بين نتائج المجموعتين.

النتائج: تضمنت الدراسة 43 من مرضى الثلاسيميا منهم 23 ذكرٍ و20 أنثى، فيما شملت مجموعة الأشخاص الأصحاء 43 شخصاً منهم 24 ذكر و19 أنثى. أشارت نتائج الاستبيان بأنه لم يكن هنالك اختلافات واضحة من الناحية الإحصائية بين المجموعتين فيما يخص النواحي النفسية (53.4 مقابل 56.9, p=0.059)، وكذلك النواحي البيئية (56.6 مقابل 57.0, p=0.884). ولقد حصل المرضى على مستويات أعلى في النواحي الاجتماعية من استبيان جودة الحياة مقارنة بالأشخاص الأصحاء (39.3 مقابل 31.7, p=0.003)، فيما حصل الأصحاء على درجات أعلى في القدرات الجسدية المندرجة في الاستبيان مقارنة بالمرضى (55.4 مقابل 61.9, p=0.047). ولم يكن هنالك اختلافات واضحة من الناحية الإحصائية بين مرضى الثلاسيميا وذلك فيما يخص العمر، واستخدام ديفيروكسامين، ومستويات الفيرتين في مصل الدم، وحدة المرض، ووجود أي مضاعفات، وحالة استئصال الطحال، وفيروس التهاب الكبد سي، والتاريخ الأسري.

الخاتمة: أظهرت الدراسة بأن جودة الحياة لدى مرضى الثلاسيميا قد كانت مماثلة لمجموعة الأصحاء وخصوصاً فيما يتعلق بالنواحي الاجتماعية، غير أن النواحي الجسدية قد كانت متدنية بين المرضى بالمقارنة بالأصحاء. ولذلك فإنه يجب تحسين الرعاية الصحية المقدمة لمثل هؤلاء المرضى. ونحن بحاجة إلى المزيد من الدراسات ذات العينات الكبيرة في هذا المجال.

Objectives: To investigate levels of quality of life (QOL) among thalassemia patients at the Hereditary Blood Disorders Center in Al-Madinah Al-Munawarah, Kingdom of Saudi Arabia.

Methods: A cross-sectional study was performed on 43 transfusion dependent thalassemia patients compared with 43 normal subjects, as a control, using the World Health Organization Quality Of Life - Brief questionnaire between May 2012 and September 2012 at the Hereditary Blood Disorders Center, Maternity and Children Hospital in Al-Madinah Al-Munawarah, Kingdom of Saudi Arabia.

Results: Forty-three thalassemia patients were examined, 23 males and 20 females, and compared with 43 peers (control group), 24 males and 19 females. There was no statistical difference between patients and controls for psychological domains (53.4 versus 56.9, p=0.059) and environmental domains (56.6 versus 57.0, p=0.884). Patients had better social QOL than the control group (39.3 versus 31.7, p=0.003), while the control group had better physical QOL (55.4 versus 61.9, p=0.047). Among patients, there was no statistical difference in QOL domains for variables of age, desferroxamine use, serum ferritin level, disease severity, presence of complications; splenectomy status, hepatitis C virus status, or family history.

Conclusion: Quality of life in thalassemia patients is similar to the control group particularly social life, though physical health is less. Improvement of patients care from all aspects will improve their QOL. More studies in this field are needed with a bigger sample size.

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β-Thalassemia disorders are characterized by defective production of hemoglobin and excessive destruction of red blood cells.[1] Thalassemia effects physical health such as physical deformities, growth on retardation, and delayed puberty, may have an impact on physical appearance, for example: bone deformities and short stature, all of which contribute to poor self-image. Other severe complications such as heart failure, cardiac arrhythmia, liver disease, endocrine complications and infections are common among patients with β-thalassemia and may impact negatively on patients' quality of life (QOL).[2] Therefore, β-thalassemia major and its complications carry a profound psychological impact on the patients.[3] The aim of regular blood transfusion is to eliminate the primary complication of severe thalassemia by ameliorating anemia and suppressing erythropoiesis.[3] Morbidity and mortality related to thalassemia have been reduced significantly with modern medical treatment, and QOL should now be considered an important index of effective health care and an essential outcome when considering options for treatment for individual patients and the allocation of health care resources.[4] As per the World Health Organization (WHO) definition, QOL is individuals' perceptions of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns.[5] In clinical practice the QOL assessments will assist clinicians in making judgments in regards to the areas in which a patient is most affected by disease, and in making treatment decisions.[5] Only a few studies have been conducted on QOL worldwide on patients with β-thalassemia. Various studies have shown that thalassemia is stressful, and patients face a variety of physical, psychological, and social problems. The findings also showed that culture and education play a major role in illness experiences.[6] For these reasons, we need to have a baseline assessment for our patients so that we can develop strategies to improve their QOL. The present study aimed to compare levels of QOL among patients with β-thalassemia at the Hereditary Blood Disorders Center in Al-Madinah Al-Munawarah, Kingdom of Saudi Arabia with their healthy peers in terms of physical health, psychological, social relationships, and environmental domains.

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Methods.

We used PubMed website as a search method to find prior related research, using keywords: pediatric, thalassemia and QOL. This study was performed according to principles of Helsinki Declaration.

Participants and settings. A cross-sectional study was performed on transfusion dependent patients with β-thalassemia on follow-up at the Hereditary Blood Disorders Center, Maternity and Children Hospital, in Al-Madinah Al-Munawarah, Kingdom of Saudi Arabia between May 2012 and September 2012. Forty-three transfusion dependent thalassemia patients, and 43 normal subjects -as control- were recruited for the study. We have assessed patients who visited the center during the study period and were willing to participate. Patients included were 15-28 years of age, and were on regular blood transfusion at intervals of 4-6 weeks for at least 5 years and did not have bone marrow transplantation. Control subjects were volunteering patients' peers from a similar age group, social, and cultural background. Exclusion criteria were presence of co morbid conditions unrelated to β-thalassemia or its complications. Demographic characteristics for the sample are described in **Table 1**. The patient group was subdivided into 2 groups according to age: patients less than 22 years, where most of them were at school or university, family dependents, and not eligible for some social department support, and patients 22-years-old or more, where they have a job, and are eligible for more social department support.

Study instruments. The WHO QOL-Brief questionnaire[5] (Arabic version) was administered to patients and to controls. It has 26 items, and 4 domains related to QOL: physical health, psychological health, social relationships and environment, and individual items covering overall QOL and general health. Higher

Table 1 - Sociodemographic characters of the studied cases and control groups in patients with thalassemia.

Variables	Cases N = 43 (%)	Control N =43 (%)	*P*-value
Age			0.192
<22 years	27 (62.8)	21 (48.8)	
≥22 years	16 (37.2)	22 (51.2)	
Gender			0.658
Males	23 (53.5)	24 (55.8)	
Females	20 (46.5)	19 (44.2)	
Nationality			0.81
Non-Saudi	31 (72.1)	31 (72.1)	
Saudi	12 (27.9)	12 (27.9)	
Education			0.703
Basic	21 (48.8)	18 (41.9)	
Secondary	14 (32.6)	14 (32.5)	
More than secondary	8 (18.6)	11 (25.6)	

*Pearson's Chi-square test, $p<0.05$

scores denote better QOL. Ohaeri and Awadalla[7] have proved that the Arabic translation of the WHO QOL-BRIEF is reliable and valid. Permission was taken from the WHO Department of Health Statistics and Informatics prior to the use of the questionnaire. The other instrument used in this study was patient's clinical records to identify patients' data and clinical information, for example: serum ferritin level, iron chelation treatment, complications, and so forth.

Data collection. All eligible patients were approached as they came in for routine follow-ups at the Hereditary Blood Disorders Center, Maternity and Children Hospital, Al-Madinah Al-Munawarah, Kingdom of Saudi Arabia. The data collection was carried out from May 2012 to September 2012. Trained persons interviewed the participants face to face. Participants consent has been taken prior to participation in the study. The Research and Ethics Committee of the Maternity and Children Hospital approved this study.

Data analysis. For this study, the terms used are defined as follows: Complication refers to diseases related to iron overload, such as abnormal liver functions, diabetes mellitus, hypothyroidism, hypoparathyroidism, or delayed puberty. An abnormal liver function test is when the serum alanine transaminase >100 mmol/L. Diabetes mellitus is defined as fasting glucose was >7.8 mmol or if symptomatic with random blood glucose of more than 11.1 mmol/l. Hypothyroidism is defined as Overt hypothyroidism was defined as subnormal free thyroxine with raised thyroid stimulating hormone. Hypoparathyroidism is defined as subnormal serum calcium with high phosphate with subnormal or inappropriately low parathyroid hormone level in the presence of hypocalcemia. Delayed puberty is defined as absence of genital development at 14 years in boys and as absence of breast development by the age of 13 years in girls. Short stature was defined as height below the third percentile on the age and gender appropriate height chart. Severity is defined as patients whose age at onset <2 and age at first transfusion <4 years, and/or patients diagnosed with homozygous β-thalassemia, and/or patients with a pre-transfusion hemoglobin level lower than 7 g/dL.[8]

The data were entered and analyzed using IBM SPSS Statistics for Windows, version 19.0, (IBM Corp., Armonk, NY, USA). Frequencies, percentages, and arithmetic mean were calculated. Chi^2 test was used for qualitative variables and t-test was applied for quantitative variables. Binary Conditional Logistic regression was used to determine the differences between cases and controls and QOL domains. $P<0.05$ was considered significant.

Results. Sociodemographic data are shown in **Table 1**, there was no significant difference noted between patients and control group. This study shows that the control group has significantly higher scores than patients group in the physical domain, while patients have significantly higher scores in the social domain. There was no significant difference between the 2 groups regarding the psychological and environmental domains (**Table 2**). The comparison between patients and controls at level of education has shown that patients with basic education significantly score better at social domain while controls have a significant better score at physical score. There was no significant deference between patients and controls with higher level of education (**Table 3**). We have found

Table 2 - Mean score of quality of life domains, cases versus controls in patients with thalassemia.

Variable	Cases	Control	Mean difference	*P*-value	SD
Physical domain	55.4	61.9	6.5	0.047	16.72
Psychological domain	53.4	56.9	3.5	0.059	7.28
Social domain	39.3	31.7	-7.6	0.003	12.30
Environmental domain	56.6	57.0	1	0.884	12.16

SD - standard deviation

Table 3 - Mean score of quality of life domains, case versus control at education level in patients with thalassemia.

Variables	Basic			Secondary			Higher		
	Cases (SD)	Control (SD)	*P*-value	Cases (SD)	Control (SD)	*P*-value	Cases (SD)	Control (SD)	*P*-value
Physical domain	55.5 (10.93)	66.0 (13.97)	0.01	57.1 (11.54)	63.3	0.31	52.5 (13.80)	53.5 (19.62)	0.91
Psychological domain	54.5 (8.65)	58.3 (7.21)	0.15	51.8 (7.82)	54.5	0.44	53.3 (9.45)	57.6 (7.45)	0.28
Social domain	40.0 (9.99)	30.8 (8.94)	0.001	37.6 (11.10)	33.0	0.30	40.6 (12.05)	31.3 (17.95)	0.22
Environmental domain	54.9 (14.71)	55.9 (11.16)	0.81	56.1 (11.25)	51.9	0.27	61.8 (9.19)	65.0 (14.81)	0.59

SD - standard deviation

Table 4 - Mean score of quality of life domains, case versus control at age group in patients with thalassemia.

Variables	<22 years			>22 years		
	Cases (SD)	Control (SD)	*P*-value	Cases (SD)	Control (SD)	*P*-value
Physical domain	53.5 (14.42)	66.1 (20.14)	0.10	56.7 (11.78)	61.1 (16.18)	0.26
Psychological domain	51.2 (10.19)	57.1 (9.84)	0.20	54.8 (8.70)	56.8 (6.85)	0.31
Social domain	37.6 (9.96)	35.7 (14.65)	0.72	40.5 (11.05)	30.9 (11.87)	0.001
Environmental domain	55.4 (14.53)	55.4 (13.11)	1.00	57.3 (11.76)	57.3 (12.14)	1.00

SD - standard deviation

Table 5 - Mean score of quality of life domains classified by clinical characteristics in patients with thalassemia.

Variables	D1	D2	D3	D4
Serum ferritin level				
<2500	54	55	38	55
>2500	57	51	41	59
P-value	0.44	0.21	0.44	0.39
Desferroxamine* use				
Not on Desferroxamine	58	54	38	58
On Desferroxamine	54	53	40	56
P-value	0.41	0.69	0.68	0.58
Disease severity				
Severe	57	54	41	57
Not severe	54	53	37	56
P-value	0.45	0.91	0.24	0.72
Family history status				
Family history	54	53	40	57
No family history	59	54	37	56
P-value	0.20	0.93	0.35	0.75
Splenectomy status				
Splenectomized	56	53	40	57
Non splenectomized	54	55	37	55
P-value	0.55	0.49	0.38	0.50
Complications				
With complication	57	54	40	57
No complication	53	52	38	55
P-value	0.41	0.55	0.44	0.62
Hepatitis C (HCV) status				
HCV +ve	57	54	40	56
HCV -ve	55	52	41	59
P-value	0.97	0.41	0.26	0.27

D1 - physical domain, D2 - psychological domain, D3 - social domain, D4 - environmental domain, *Desferroxamine (Novartis®, Switzerland)

that patients with β-thalassemia 22 years of age or above have significantly higher scores in the social domain than the younger age group (**Table 4**). There was no significant difference in all domains among patients with β-thalassemia when comparing variables including use of desferroxamine, disease severity, family history status, presence of complication, as shown in **Table 5**.

Discussion. This aspect of patients with β-thalassemia management was dim and ignored, we tried to highlight this area especially in the developing countries where resources are not so feasible aiming at improving patients' QOL in non-costly ways, such as offering psychological and social support. The limitation of this study was the small sample size. The WHOQOL-Brief questionnaire used has shown good discriminant validity, content validity, internal consistency, and test-retest reliability.[7,9] This study shows that normal controls have significantly higher score than patients with β-thalassemia in physical domain; patients are subject to the long-term side effects of chronic anemia and repeated transfusions.[4,10-13] However, we have found that patients with β-thalassemia have significantly higher score in the social domain, in contrary to other studies results.[4,10,14-16] Other studies, however reported that their study subjects felt that the disease did not affect their family or social relationships.[17] Finding that patients have significantly higher scores in the social domain than normal controls can be explained by the strong support strategies that are available at our center, such as: frequent social gathering; financial support; facilitating job opportunities for the patients; frequent workshops; patients' participation in conferences abroad; liaising with their schools; free educational courses; premarital counseling for the patient and the partner with continuous support for new families and the one family environment that is offered by permanent medical staff for more than 15 years in the center, in addition to the support from the Ministry of Social Affairs, as well as from non-governmental organizations. In fact, these supportive activities are not readily available for healthy subjects in our community. Another important impact factor, which may play a role, is the effect of Al-Madinah Al-Munawarah city as a main religious center for Muslims, which provides a sense of satisfaction and peace. Regarding the psychological and environmental domains, we have found that there was no significant difference between patients and controls. In contrary to previous reports, we found that age has no significant relation to QOL scores,[18] and this finding could be due to age group differences between our study in which all patients are adolescents and adults in contrast to the previous reports that included younger patients, considering the fact that older children with β-thalassemia experience fewer symptoms of depression, reflecting a process of adjustment and coping.[11] We also found that desferrioxamine use was not significantly related to QOL scores. This was in contrast to other studies, which found that, due to the burden of nightly subcutaneous injections of desferrioxamine,

iron chelation treatment was significantly related to impaired QOL.[18,19] This could be again explained by the age group differences as older patients are used to nightly subcutaneous injections of desferrioxamine for long periods so that its impact is less noticed. Although some reports indicated that long-term iron overload might lead to severe morbidity and mortality,[4,20,21] and that a serum ferritin level higher than 2,500 ng/dL is associated with cardiac complications and mortality, in agreement with previous studies,[2,18] this study found no relationship between serum ferritin level and QOL. We have found that disease severity, presence of complications; splenectomy status, hepatitis C virus status, and family history were not significantly related to QOL scores. These results have been shown in other studies, which reported that type of thalassemia, clinical severity, age of onset, and pre-transfusion hematocrit level have not significantly affected the QOL of the patients,[3,13,18] and this is in contrast to a different study stating that age at first transfusion, pre-transfusion hemoglobin level, and disease severity significantly affected the QOL of the patients.[18]

In conclusion, QOL in patients with β-thalassemia is similar to the control group particularly for social life, though physical health is less. Improvement of patient care from all aspects will improve their QOL. Support strategies for patients with β-thalassemia are very effective in improving their QOL. More studies in this field are needed with a larger sample size to corroborate our findings.

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