Original Article

Association of Emotional and Behavioral Difficulties with Quality of Life for Iraqi Children with Short Stature

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Abstract

Background: Short stature (SS) is a condition in which a child's or teen's height is well below the average height of his or her peers. The importance of adaptation, the potential effects of stature height, and the effects of growth hormone therapy need to be researched to better understand psychological functioning. **Objective:** The study will measure the degree of impact of SS on behavioral patterns and quality of life (QoL) in children. **Materials and Methods:** One hundred children and adolescents, with a diagnosis of idiopathic SS (ISS) (40 cases) and growth hormone deficiency (GHD) (60 cases), participated in this study with their parents. Their age was between 4 and 17 years old. The parents were given a written questionnaire to fill out, which included questions that determined the psychological performance and the QoL of their children. **Results:** The total difficulties and the QoL scores for the ISS and GHD were close to each other. The association with the sociodemographic data showed no significance except in gender, with more depressed QoL in male. The correlation was negative between the degree of difficulties and the QoL of both the GHD and the ISS. **Conclusion:** The result of this study shows that there is an increase in the scores given by the parents of SS groups for the overall assessment of psychosocial problems and a decrease in the QOL scores due to the significant impact of height.

Keywords: Behavioral pattern, quality of life, short stature

Introduction

Short stature (SS) is a condition in which a child's or teen's height is well below the average height of his or her peers.[1] Genetic and environmental factors both play a role in determining the heritability of stature.[2] The biological mother's and father's average heights serve as the foundation for the anticipated height.[3] A total of 97% of young adolescent parents are unaware that their child's shortness is caused by illnesses and wrongly think it is due to a delay in the child's growth or inherited factors.[4] The underlying hormonal issue can be treated with a variety of hormonal therapies, which should be provided as soon as possible. This will address the underlying issue, stop the progression of SS, and stop its psychological impacts.[5] SS is classified into primary growth failure, secondary growth failure, and idiopathic SS (ISS), each with multiple subcategories.[6] Growth hormone deficiency (GHD), familial SS, and constitutional delay in growth and puberty were the leading causes of SS in Iraqi patients referred to hospitals.[7] The most typical symptom of GHD is growth failure, which often manifests in infancy and early childhood. The bone age will normally be delayed, and the height percentile of a child with GHD will gradually drop.[8] The significant interindividual variations in SS adaptation and the effects of being short may be influenced by a number of risk and protective factors, including parental attitudes and prevailing cultural beliefs.[9] SS children and adolescents are more likely to experience isolation and discrimination because they are regularly teased, rejected, or overprotected by peers, teachers, and parents, in addition to facing environmental obstacles

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to the development of autonomy.[10] The importance of adaptation, the potential effects of stature height, and the effects of growth hormone therapy need to be researched to better understand psychological functioning. Routine assessment of health-related quality of life (QoL) in pediatric healthcare may help identify children for referral to specialized psychological assessment and intervention.[11] The QoL in SS youth (QoLISSY) questionnaire was specifically developed to assess QoL in children with SS from the viewpoints of both the patient and the parents.[12]

This study is concerned with measuring the degree of impact of SS on behavioral patterns and QoL in children, determining its association with the sociodemographic data, and correlating the degree of difficulties with the QoL.

Materials and Methods

This cross-sectional study involved 100 children and adolescents (40 with a diagnosis of ISS and 60 with a diagnosis of GHD) and their parents in Iraq. A participation consent form has been given to the parents for their approval. The age of the participants was between 4 and 17 years old. All 100 participants were previously diagnosed with heights two standard deviations or more below the age- and gender-adjusted population norms at the time of diagnosis and are being administered recombinant human growth hormone (rhGH) treatment continuously for not less than 6 months.[13] rhGH treatment is given subcutaneously each day in the evening. The study excluded patient with chronic systemic diseases, severe mental disorders, and/or primary growth failure.[14] The involved participants were divided into two groups according to their diagnostic criteria. Participation and data collection started in the middle of September 2022 and continued until the end of December 2022. The parents of the participants were given two types of written questionnaires in Arabic to fill out after the researcher filled out the sociodemographic and clinical data, which included questions that determined the psychological performance (strengths and difficulties questionnaire [SDQ]) and the QoL (QoLISSY questionnaire) of their children. SDQ is a brief behavioral screening questionnaire for 2–17 years old. It comprises five scales with five items each: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behavior. The items are to be answered using a Likert-type response scale. The P4-17 SDQ and impact supplement for the parents of 4–17 year olds were used, in which the higher the scores the more the difficulties for children.[15] The QoLISSY questionnaire for parents is used, which consists of 22 Likert-scaled items assigned to three core dimensions: physical, social, and emotional with 44 additional items in the dimensions: coping, beliefs, and treatment (reflecting child assessment) as well as future and effect on parents.[3]

Statistical Analysis

R software packages (dplyr, gtsummery, and ggplot) were used for data processing, visualization, and statistical analysis ("R version 4.2.2, R Foundation for Statistical Computing, Vienna, Austria"). A P value of less than or equal to 0.05 is considered significantly different, whereas more than 0.05 is considered not significantly different.

Ethical approval

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. It was carried out with patients' verbal and analytical approval before the sample was taken. The study protocol and the subject information and consent form were reviewed and approved by a local ethics committee according to the document number 123 on May 29, 2023 to get this approval.

Results

The mean age of the participants was 12 years old, with 55% of males and 45% of females. The sociodemographic data of the ISS and GHD showed no significant differences between them except in the mean body mass index (BMI) percentile and residence, with a *P* value of 0.032, in which the GHD were from rural areas more than urban areas and had a higher BMI% than the ISS [Table 1].

The ISS and GHD showed no significant difference regarding their clinical data except in the mean level of serum GH ($P < 0.001$), given in Table 2.

The change in height during treatment for ISS and GHD is represented in Figure 1.

The mean SDQ scores for the ISS and GHD were close to each other, with no significant difference, as shown in Table 3.

There was no significant difference in the QoLISSY total scores between the ISS and GHD, provided in Table 4.

Regarding the association between the sociodemographic data and the SDQ and QoLISSY total scores for the ISS [Table 5], no significant results were observed.

The association between the sociodemographic data and the SDQ and QoLISSY total cores for the GHD showed a significant difference regarding gender [Table 6], with more depressed QoL in the male than in the female ($P = 0.047$).

The correlation between the SDQ and the QoLISSY total scores was negative in both the ISS and the GHD ($P < 0.001$), as shown in Table 7.

Discussion

This is the first study performed in Iraq (exploratory endpoint). The ISS and GHD are among the most

Table 1: The sociodemographic characteristics of the short-statured participants in the study

Characteristics	ISS, $N = 40$[a]	GHD, $N = 60$[a]	*P* value[b]
Age, years	12.4 ± 3.0	12.1 ± 2.7	0.6
4–7	4 (10.0%)	5 (8.3%)	>0.9
8–12	14 (35.0%)	21 (35.0%)	
13–18	22 (55.0%)	34 (56.7%)	
Gender			
Male	26 (65.0%)	29 (48.3%)	0.10
Female	14 (35.0%)	31 (51.7%)	
BMI (kg/m^2)	16.7 ± 2.4	17.6 ± 2.7	0.062
BMI percentile	28.3 ± 28.1	41.6 ± 32.2	0.032*
<5	11 (27.5%)	10 (16.7%)	0.2
≥5 to <85	28 (70.0%)	43 (71.7%)	
≥85 to <95	0 (0.0%)	4 (6.7%)	
≥95	1 (2.5%)	3 (5.0%)	
Duration of disease (months)	19.9 ± 15.8	24.6 ± 23.8	0.2
<12 months	13 (32.5%)	21 (35.0%)	>0.9
12–24 months	15 (37.5%)	21 (35.0%)	
>24 month	12 (30.0%)	18 (30.0%)	
Co-existing disease	0 (0.0%)	4 (6.7%)	0.15
Family history	9 (22.5%)	17 (28.3%)	0.5
No. of children affected	1 (1-3)	1 (1-4)	>0.9
Residence			
Rural area	25 (62.5%)	49 (81.7%)	0.032*
Urban area	15 (37.5%)	11 (18.3%)	
Education level			
Preschool	1 (2.5%)	2 (3.3%)	0.9
Primary school	19 (47.5%)	26 (43.3%)	
Secondary school	18 (45.0%)	31 (51.7%)	
No school	3 (7.5%)	3 (5.0%)	

[a]Mean ± standard deviation; median (range); number (percentage).

[b]Chi-square test; Welch two sample *t* test; Fisher's exact text.

*$P \leq 0.05$, indicating significant difference

Table 2: The clinical characteristics of the short-statured participants in the study

Characteristics	ISS, $N = 40$[a]	GHD, $N = 60$[a]	*P* value[b]
Duration of treatment (months)	13.7 ± 6.8	14.7 ± 8.9	0.5
<12 months	18 (45.0%)	25 (41.7%)	>0.9
12–24 months	20 (50.0%)	32 (53.3%)	
>24 months	2 (5.0%)	3 (5.0%)	
Serum GH (ng/mL)	10.4 ± 3.7	3.9 ± 2.0	<0.001*
Serum IGF-1 level (ng/mL)	144.4 ± 66.4	158.7 ± 84.6	0.4
Height change (cm)	8.6 ± 3.7	9.8 ± 4.3	0.14

[a]Mean ± standard deviation; number (percentage).

[b]Welch two sample *t* test; Fisher's exact text.

*$P \leq 0.05$, indicating significant difference

common causes of SS, as shown in Rabbani *et al.*'s[16] study, therefore it's included in this study. The majority of participants had a normal BMI percentile. The mean serum GH level was significantly different between ISS and GHD.[17] The patients' psychosocial problems were measured using the parent-rated SDQ version, which was originally designed to represent strengths and difficulties in children and young people, with higher scores indicating higher difficulties and psychosocial problems, except in prosocial behavior, where a lower score indicates more problems. The result of this study shows that there is an increase in the score of SS groups for the overall assessment of psychosocial problems that matches the studies of Aryayev *et al.*[18] and Butler *et al.*[19] but there is no significant difference between the two groups.[20] Also, there is an impact of SS on QoL in children because

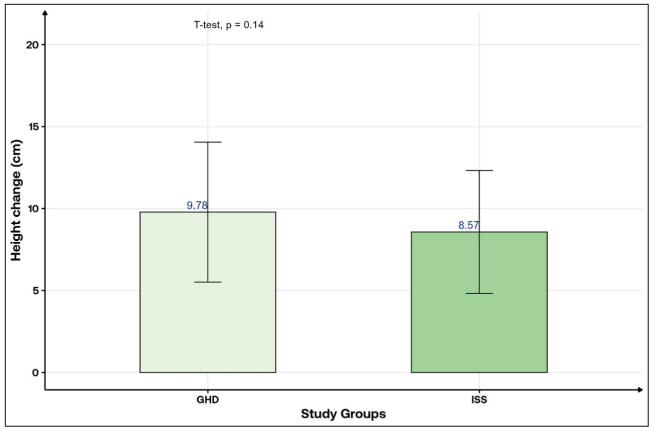

Figure 1: Height change in idiopathic short stature and growth hormone deficiency

the parents report that their children are less socially competent and, in general, have more social problems.[21] There was no significant relationship observed between the patient's demographic data and the total SDQ and QoLISSY scores among SS groups, except in the gender of the GHD group, in which males reported less QoL than females, and it was significantly different. This is because males require more height than females, which influences people's perception of them. There is a negative correlation between SDQ and QoLISSY scores, with a higher SDQ score indicating lower QoL in SS groups. This is because as the difficulties that children face increase every day, their overall QoL decreases spontaneously due to physical, social, and emotional problems that affect children's and adolescents lives.[11]

Table 3: The strengths and difficulties questionnaire scores

Characteristics	ISS, $N = 40$[a]	GHD, $N = 60$[a]	*P* value[b]
Emotional symptoms	4.2±3.1	4.2±2.7	>0.9
Conduct problems	3.0±2.1	3.2±1.7	0.6
Hyperactivity/inattention	5.1±2.5	4.3±2.5	0.2
Peers relationship problems	2.8±1.9	3.2±1.9	0.3
Total difficulties score	15.1±7.4	14.9±5.4	>0.9
Prosocial behavior	9.4±1.1	9.0±1.5	0.11
Impact	1.5±2.6	1.8±2.2	0.6

[a]Mean ± standard deviation.
[b]Welch two sample *t* test

Table 4: The quality of life in short stature youth questionnaire

Characteristics	ISS, $N = 40$[a]	GHD, $N = 60$[a]	*P* value[b]
QoLISSY total score	73.6±21.0	70.0±21.6	0.4

[a]Mean ± standard deviation.
[b]Welch two sample *t* test.
*QoLISSY total score is the sum of physical, social, and emotional domains[3]

Table 5: Association between patient's demographic characteristics with strengths and difficulties questionnaire and quality of life in short-statured youth scores of ISS group, $N = 40$

Characteristics	QoLISSY total[a]	*P*-value[b]	SDQ difficulties[a]	*P* value[b]
Age, years				
4–7	82.7±9.1	0.3	7.5±4.2	0.086
8–12	67.2±23.6		16.6±6.2	
13–18	76.0±20.4		15.4±8.0	
Gender				
Male	74.5±19.2	0.7	16.1±8.1	0.2
Female	71.9±24.7		13.1±5.8	
BMI percentile				
<5	68.3±22.7	0.3	16.0±5.9	0.7
≥5 to <85	76.4±20.3		14.5±8.0	
≥95	52.4 ± NA		20.0 ± NA	
Duration of disease (months)				
<12 months	77.5±20.1	0.6	14.6±6.0	0.7
12–24 months	73.7±21.2		16.4±8.3	
>24 month	69.2±22.7		13.8±8.0	

[a]Mean ± standard deviation.
[b]One-way analysis of variance; Welch two sample *t* test

Table 6: Comparison between patient's demographic data with the results of SDQ and QoLISSY Scores of GHD group, *N* = 60

Characteristics	QoLISSY total[a]	*P* value[b]	SDQ difficulties[a]	*P* value[b]
Age, years				
4–7	89.8 ± 6.9	0.074	12.4 ± 6.1	0.4
8–12	65.4 ± 24.6		14.3 ± 4.9	
13–18	69.9 ± 19.8		15.7 ± 5.7	
Gender				
Male	64.2 ± 22.4	0.047*	14.4 ± 4.8	0.5
Female	75.3 ± 19.8		15.4 ± 6.0	
BMI percentile				
<5	61.6 ± 23.2	0.5	17.1 ± 3.2	0.13
≥5 to <85	71.9 ± 21.1		15.1 ± 5.7	
≥85 to < 95	64.4 ± 31.6		11.2 ± 4.7	
≥95	77.3 ± 4.1		10.3 ± 5.5	
Duration of disease (months)				
<12 months	69.8 ± 21.0	0.7	14.3 ± 5.4	0.8
12–24 months	67.5 ± 24.1		15.5 ± 4.7	
>24 month	73.1 ± 20.2		15.1 ± 6.4	

[a]Mean ± standard deviation.

[b]One-way analysis of variance; Welch two sample *t* test.

*$P \leq 0.05$, indicating significant difference

Table 7: Correlation between SDQ and QOLISSY total scores in ISS and GHD groups

Characteristics	Correlation coefficient (*R*)	*P* value
ISS cohort	−0.4790	**<0.001**
GHD cohort	−0.4794	**<0.001**

Pearson's product-moment correlation

$P \leq 0.05$, indicating significant difference

Limitation of this study

The limitation of the study is small sample size and the unavailability of GH therapy during the study.

Interpretation and Implication of this study

The study shows the importance of referral of children/adolescents with poor QoL and their parents to a psychiatric, which is capable of communicating with them to address the problems. If the problem is due to poor drug performance/compliance, then drug modification/educational programs are required for better response.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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