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Depression And Quality Of Life In Children With ESRD Undergoing Hemodialysis In Minia Governorate

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Abstract:

Objective: Our aim of this case-control study was to evaluate and measure the depression and quality of life in children with End Stage Renal Disease (ESRD). We compared these results with healthy controls.

Methods: Fifty children were selected for our study. These ESRD children are on hemodialysis for more than one year. Questionnaires were used to assess both Quality of Life (QOL) and depression. The demographic data, clinical, and laboratory measurements were also collected.

Results: There was a statistically significant difference between cases and controls groups regarding depression as measured by CDI ($p<0.001$). Children with ESRD had a tendency for impairment in QOL (Generic and specific QOL Scale). Depression is correlated with impairment of QOL.

Conclusions: Depression and low QOL are significantly high in ESRD children on hemodialysis. So, screening for depressive symptoms among these patients is critical as early treatment may improve their general wellbeing.

Key words: ESRD, Children, Depression, QOL.

Introduction

End stage renal disease (ESRD) is considered as the dysfunctional state for both kidneys that need either dialysis or renal transplantation as a replacement therapy. [1]

The advances in medicine give much ability to decrease the levels of both morbidity and mortality rates of ESRD.[2]

ESRD mostly leads to both physiological and social problems related to quality of life.[3]

Depression is highly associated with significant low quality of life in children.[4]

Depressive manifestations are usually due to the disturbance of serotonin level secondary to disturbed hypothalamic pituitary adrenal axis through the effect of mediators released in chronic inflammatory state of ESRD.[5]

Methods

This case control study was conducted between (2017–2018) on children and adolescent patients with ESRD and on hemodialysis. It has been applied in hemodialysis units of both Minia University Hospital and Minia General Hospital in Egypt.

The study includes 2 groups:

Cases Group contains 50 children, 32 patients from Minia university children hospital, and 18 patients from Minia general hospital. They have met the inclusions criteria of ESRD that diagnosed clinically and laboratory. The exclusion criteria were any other significant medical, neurological disorders or any chronic diseases that may affect the psychometric analysis.

Control Group contains 40 children and its inclusion criteria were that they do not suffer from any kidney disease or any other chronic debilitating diseases or medical treatment intake.

All the children in the study are subjected to:

Sociodemographic data: name, age, sex, residence, education level, time of beginning with hemodialysis, their hemodialysis schedule and socioeconomic study.

Measurement: height or length, weight (pre-dialysis) and Body Mass Index (BMI).

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Laboratory data: hemoglobin level, urea and creatinine level, serum albumin level.
Assessment of depressive symptoms: using Children Depression Inventory (CDI)
CDI is 27-item scale that is self-rated and symptoms oriented. The 27 items are grouped into five major factor areas which are: Anhedonia, Negative Self Esteem, Incompetence, Maladaptation and Social Withdrawal. Children rate themselves based on how they feel and think, with each statement being identified with a rating from 0 to 2.
It refers to cognitive, affective and behavioral depressive symptoms. Total score ranges from 0 to 54 and a cut off score of 19 is indicative for clinical depression. The average time to complete this questionnaire is 15 minutes.
We used a translated Arabic copy from the original English version of the Questionnaire which was translated by a psychiatric expert at Minia University Hospital.[6]
Assessment of both generic and specific quality of life: using 2 types of questionnaires that were translated into Arabic copies from the original English version by a psychiatric expert at Minia University Hospital. [7]
PedsQL 3.0 ESRD Module: It has 34-item, and encompasses 7 scales: (1) General Fatigue (4 items), (2) About My Kidney Disease (5 items), (3) Treatment Problems (4 items), (4) Family and Peer Interaction (3 items), (5) Worry (10 items) (6) Perceived Physical Appearance (3 items), and (7) Communication (5 items).
PedsQL 4.0 Generic Core Scales: it has 23-item, and encompasses 4 scales: (1) Physical Functioning (8 items), (2) Emotional Functioning (5items), (3) Social Functioning (5 items), and (4) School Functioning (5 items).
Scoring of both types of QOL Questionnaires: A 5-point response scale is used across the child self-report for ages 8 to 18 years and parent-proxy report for every item (0 indicates never a problem; 1, almost never a problem; 2, sometimes a problem; 3, often a problem; and 4, almost always a problem). Items are reverse scored and linearly transformed to a 0 to 100 scale (0 =100, 1=75, 2=50, 3=25, 4=0 (so that higher scores indicate better HRQOL. [7]

Ethically

The agreement of the Ethical Scientific Committee of Minia Faculty of Medicine was obtained before the start of the research.
A written and oral consent obtained from all participating in this study.

Statistical Analysis

Statistical presentation and analysis of the present study was conducted, using the mean, standard error, student t- test, paired t-test, Chi-square, Linear Correlation Coefficient and analysis of variance (ANOVA) tests by Statistical Program for Social Science version 20 (SPSS Inc., Chicago, IL, USA).

Results

Fifty patients are participated in the present study a, as shown that the mean age (±SD) was 12.5±2.4 years. Eighteen patients (45%) were males and 22 (55%) were females. As regards sociodemographic data comparison between cases and control groups revealed that there was no statistically significant difference except in education and residence (table 1; p=0.021 & 0.01respectively).

Table (1): Sociodemographic data in cases and controls

Sociodemographic data	Cases	Control	P value
	N=50	N=40	
Age Range Mean ± SD	 (6-20) 12.3±3.1	 (9-16) 12.5±2.4	0.738
Sex **Male** **Female**	 26(52%) 24(48%)	 18(45%) 22(55%)	0.509
Residence **Urban** **Rural**	 40(80%) 10(20%)	 23(57.5%) 17(42.5%)	0.021*
Education level **Illiterate** **Read and write** **Primary** **Secondary** **High school**	 3(6%) 1(2%) 22(44%) 18(36%) 6(12%)	 0(0%) 0(0%) 4(10%) 20(50%) 16(40%)	<0.001*

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Regarding depression which is measured by (CDI) for depression and its domains (anhedonia, negative self-esteem, incompetence- maladaptation, social withdrawal), there was a statistical significant difference between cases and controls groups including all the parameters ($p < 0.001$) as in table (2)

Table (2): Depression scores measured by (CDI) in cases and controls:

		Cases	Controls	P value
		N=50	N=40	
CDI total	Range Mean ± SD Median	(18-29) 23.7±2.8 24	(4-14) 8.7±3.3 8	**<0.001***
CDI. Anhedonia	Range Mean ± SD Median	(5-12) 8.8±1.4 9	(0-6) 2.6±1.6 2	**<0.001***
CDI. Negative self esteem	Range Mean ± SD Median	(2-9) 5.6±1.6 6	(0-4) 2.1±1.3 2	**<0.001***
CDI. Incomptence. Maladaptation	Range Mean ± SD Median	(2-9) 4.5±1.5 4	(0-7) 2.7±1.9 2	**<0.001***
CDI. Social Withdrawal	Range Mean ± SD Median	(2-9) 4.7±1.4 4	(0-4) 1.8±1.1 2	**<0.001***

However, Generic QOL including (total, health, feeling, how I get along with other, school) with high statistically significant difference in both cases and control groups, and tendency to low generic QOL in cases as in table (3)

Table (3): Generic QOL scores for cases with ESRD

		Cases	Control	P value
		N=50	N=40	
generic QOL Total	Range Mean ± SD Median	(32-82) 57.9±10.9 58	(2-14) 7.8±3.5 6.5	**<0.001***
generic QOL Health	Range Mean ± SD Median	(6-30) 21.7±5.3 23	(1-6) 3.2±1.5 3	**<0.001***
generic QOL Feeling	Range Mean ± SD Median	(5-17) 11.6±3.3 11	(0-3) 1.4±.9 1.5	**<0.001***
generic QOL How I get along with others	Range Mean ± SD Median	(4-19) 9.3±3.8 8.5	(0-4) 1.4±1.2 1.5	**<0.001***
generic QOL School	Range Mean ± SD Median	(7-20) 15.3±3.3 15	(0-5) 1.8±1.4 1.5	**<0.001***

Specific QOL for ESRD children is represented as scores in table (4) and show more tendencies to low specific QOL.

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Table (4): Specific QOL scores for children with ESRD

		Descriptive statistics N=50
QOL Specific Total	Range Mean ± SD Median	(47-106) 79.8±13.5 78.5
QOL Specific fatigue	Range Mean ± SD Median	(5-16) 10.5±2.4 11
QOL Specific about my kidney	Range Mean ± SD Median	(5-16) 11±2.9 11
QOL Specific TTT	Range Mean ± SD Median	(4-15) 8.8±2.2 8
QOL Specific family and pairs interaction	Range Mean ± SD Median	(3-12) 7±1.6 7
QOL Specific WORRY	Range Mean ± SD Median	(14-36) 25.6±5.3 25
QOL Specific Received physical appearance	Range Mean ± SD Median	(2-12) 6.8±2 7
QOL Specific Communication	Range Mean ± SD Median	(5-15) 10.1±2.5 10

Total scores of depression measured by (CDI) has showed a positive non-significant fair correlation with body mass index (BMI) while has showed with (HB-Albumin-urea-creatinine) a negative non-significant fair up to mild correlation.

Total score of depression measured by (CDI) showed a positive fair non-significant correlation with generic QOL percentage, while with specific QOL percentage shows a negative fair non-significant correlation as described table (5)

Table (5): Correlation between depression and total (generic QOL, specific QOL)

	CDI total	
	R	**P value**
Generic QOL	-0.002	0.990
Generic QOL percent	0.002	0.990
Specific QOL	0.230	0.108
Specific QOL percent	-0.228	0.111

- **Pearson's correlation**

***: Significant level at P value < 0.05**

The generic QOL percentage is giving a negative non-significant fair up to mild correlation with (BMI-urea-creatinine) and positive no significant fair correlation with (albumin-HB).

Specific QOL percentage is showing a negative fair non-significant correlation with (BMI-HB-creatinine), and a positive fair non-significant correlation with (albumin), and positive mild significant correlation with (urea) as in table (6):

Table (6): Correlation between total specific QOL and (BMI-HB-urea-creatinine-albumin)

	Specific QOL		Specific QOL percent	
	R	**P value**	**r**	**P value**
BMI	0.062	0.672	-0.082	0.577
Hb	0.008	0.956	-0.021	0.886
Albumin	-0.046	0.751	0.043	0.764
Urea	-0.289	0.042	0.300	0.034
Creatinine	0.106	0.465	-0.113	0.434

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(*) Significant correlation (**) Pearson's correlation Grades of r: 0.00 to 0.24 (weak or no association), 0.25 to 0.49 (fair association), 0.50 to 0.74 (moderate association), ≥ 0.75 (strong association).

Discussion

This study has showed that ESRD is associated and positively correlated with high levels of depression measured by CDI scale. These levels were more significant in those on hemodialysis, when compared with control group. Also this study revealed that the ESRD is almost related to poor QOL either generic or specific, measured and scored by Goldstein scale.

Many studies as Hernandez et al, 2011 and Amr et al, 2009 have confirmed that the patients with ESRD and on hemodialysis are complaining of abnormal psychological symptoms especially depression when compared to control group.

Kogan et al, 2013 reported that depression is one of comorbid psychiatric problems in adults with ESRD. [4]

However, Diseth et al, 2011 revealed a significant low score of QOL for both children and adolescents' patients with ESRD when compared with control group in all subclasses of generic and specific related to QOL. [8]

This study stated that there is a negative correlation between the low generic QOL and high total depressive score for ESRD patients. This result is in accordance with the study of Al-Uzri and his colleagues (Al-Uzri et al, 2013). [9]

The study has clarified the relation between the severity of ESRD and demographic data; as there was significant relation between rural residence, low education level and severity of ESRD. Ruidiaz-Gómez and Higuita-Gutiérrez, 2020 have revealed that pediatric patients with chronic kidney disease have lower health related QOL than healthy patients, specifically in the school, physical, emotional and social dimensions. [10]

Clavé et al, 2019 recommended that the assessments of QOL in children with chronic kidney diseases, particularly in adolescents, are needed to evaluate the psychosocial well-being and to understand the impact of the disease and its treatment. [11]

There was significant relation between low generic and specific QOL, high level of depression and high urea level indicating severity of kidney injury. Riano-Galan et al 2009 confirmed that there is a negative correlation between low QOL in ESRD patients on hemodialysis and their hemoglobin, weight and height levels that explains their low BMI. So administration of erythropoietin for anemia correction has a strong role in treating health related QOL. [12]

Barden, 2004 could explain that depression with ESRD leads to high stress. It may be due to dysregulation of hypothalamic pituitary adrenal axis followed by abnormal metabolism. [13]

Conclusions

Depression and morbid QOL are severe problems in ESRD patients on hemodialysis so they should be included in the course of disease management.

Disclosure

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

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