"Beck Depression Inventory scores for children with some chronic diseases (Type I diabetes mellitus, Sickle cell anaemia, and AIDS) on management in University of Port Harcourt Teaching Hospital"

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Abstract

Objective: To assess and compare the Beck Depression Inventory scores of children with type 1 diabetes, Sickle cell anaemia and HIV/AIDS.

Design: Descriptive and comparative cross sectional

Patients and methods: Using the Beck Depression Inventory, we screened 145 adolescents (30 Diabetes, 57 Sickle cell anaemia and 58 HIV) aged 10-18 years who were on follow-up in the consultant paediatric clinic within a six-month period. Demographic characteristics like age, socio-economic status, duration of illness and frequency of admission were used to find out factors affecting the depression score.

Result: The mean age was 14.0 ◎ 2.54 and there was no difference in the mean age between groups, F=0.740, p=0.479. The population had more children in the middle socio-economic class, 83 (57.2%). Fifty-four (37.2%) subjects had scores in the clinical depression category and difference in proportion between the participants in the three groups with depression was significant, ◎2=9.441, p=0.002. The mean BDI score was highest among those with sickle disease 15.63 ± 6.71, and lowest in the diabetes patients 12.18 ± 6.02, p=0.303. Stigmatization, suicidal thoughts and insomnia were significant correlates with the mean BDI scores in the three groups, but the disease severity index was only significantly associated with BDI in the HIV/AIDS group.

Conclusion: Fewer children with TIDM had depressive symptoms compared to the SSA and HIV/AIDS counterpart. CD4+ count (disease severity) had a significant association with the BDI score but not HbA1c and stable state haemoglobin.

Keywords: Depression; Children; Diabetes; Sickle cell; HIV/AIDS; Nigeria

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Introduction

Managing children with chronic diseases is tasking, taxing and burdensome not only to the patient and parents, but also to the managing team who need to appraise the physical illness, and eventually the psychological toll on the patients.[1-6] The risk of depression is higher in children with chronic medical disorders than their healthy counterparts and this is due mainly to the disease, the duration of the diseases, the drugs and effects of these drugs used in treating them

There are some patients whose conditions are compounded by their socio-economic circumstances and these are made more manifest by their inability to procure drugs, investigations and feed properly to meet the dietary requirements of the disease process.[5,7,8]

Children with diabetes mellitus have the added responsibility of checking their blood glucose at least four times daily, giving themselves insulin at least twice daily, avoid or reduce the intake of refined sugars with other instructions that limit their "normal" childhood activities. Many support structures are in place in many countries to reduce the social burden on these children eg organisations like Life-for-a-Child giving free insulin, but these are not fully developed in Nigeria.[9,10] Sickle cell anaemia patients are saddled with frequent vaso-occlusive painful crises and blood transfusions that keep them out of school for long durations at a time.[11] However, there are many support societies for sickle cell anaemia and philanthropic gestures to provide for their needs and this is possibly because of the prevalence of the diseases in Nigeria. The treatment of HIV/AIDS in Nigeria is Government and donor-organisation funded, so many children get their medications and testing for free making them likely to live a more productive life with little or no complications.[12,13]

Children with psychological stress and Major Depressive Disorder have the risk of causing harm to themselves and others around them if they go unrecognized and untreated. For those with chronic medical disorders, the confounding psychological stress or depressive disorder will likely prevent proper management of their diseases as they may fail to take their drugs, adhere to counsel and default for follow up. While it is difficult to measure depression in clinical settings, several depression screening

tools have been standardized for children and adolescents, and the Beck Depression Inventory scale is a common and simple tool used worldwide for self-reporting of symptoms.[14,15]

We decided to screen children with some chronic diseases for depression to compare their vulnerability between three groups of patients in our hospital and to know the factors, if any that may contribute to their risks. The result of this inventory will be used to start up intervention programmes for the various groups.[8]

Material and methods

After ethical clearance was obtained from the research and ethics committee of the University of Port Harcourt Teaching Hospital, and consent from the patients, an interviewer-administered Beck Depressive Inventory was given to adolescents aged 10 to 18 years on follow-up at the Consultant Paediatric Clinic at the Department of Paediatrics, University of Port Harcourt Teaching Hospital from 1st of October to 31st of March 2019. Subjects with type 1 diabetes mellitus, sickle cell anaemia and HIV/AIDS (total of 75) were recruited from the clinics of these various units and the ward, if they were on admission. We excluded children who have been diagnosed with any form of mental conditions like schizophrenia, depression, bipolar or autism. Parents and children were presented with the information about the study and following assent from the children, the interview was conducted in the presence of their parents. Children who needed their parents to help understand questions asked or to corroborate answers were allowed to do this.

The Beck Depression inventory score is a 21-question inventory with scores of 0-3 for each item and the possible total is 60 maximum with 0 as minimum. A score of over 18 was set as cut-off for depression for which the patient was referred to a psychologist and psychiatrist for proper diagnosis and management. The interviews lasted about 20-30 minutes per patient, and some patients who had difficulty answering the questions due to emotional outbursts, were comforted for a while and the interviews continued without further hitches. Disease severity of subjects was determined by HbA1c (for diabetes), stable state Hb (for Sickle cell disease) and CD4+ count (for HIV). Any child with evidence of end organ damage was excluded from the study to reduce bias.

Statistical analyses

The data was entered directly into Statistical Package for Social Sciences (SPSS) version 24, and data were presented as mean scores or median and percentages for prevalence. Raw scores for Depression indices were then categorized into 6 scales of severity ie 0-10 as normal, 11-16 minimal and mood disturbances, 17-20 as borderline clinical depression, 21-30 as moderate depression, 32-40 as severe depression and over 40 as extreme depression. Mean scores were compared between disease categories using ANOVA and a post hoc analysis was done between one disease group and another eg between diabetes and HIV; HIV and sickle cell; diabetes and sickle cell disease and regression analysis was used to determine association between depression index score (dependent variable) and independent variables (social class, suicidal thoughts, insomnia, disease severity and stigmatisation) and a p value <0.05 was set as statistical significance for differences.

Results

Demography

There were 145 subjects at the end of the study period; 30 with type 1 diabetes mellitus, 57 with sickle cell disease and 58 with HIV and the differences in proportion was significant, (X^2=10.44, p=0.005). There were more males, 89 (61.1%) than females 56 (38.6%) and this difference was significant (p=0.006), however, the proportion of various sexes between the groups was not significant, (X^2=0.464, p=0.793). The mean age of the study population was 14.00 ± 2.5 years and there was no difference in the mean age between the 3 groups, F=0.74, p=0.479. Most of the subjects were in the middle social class 83 (57.2%), with 21 (14.5%) in the high social class and 41(28.3%) in the low social class (X^2=2.045, p=0.727) (Table 1).

Table 1: Socio demographic and some clinical variables of the study population.

Variable	T1DM (n=30)	SSA (n=57)	HIV (n=58)	F/X^2	p value
Mean age (SD)	13.92 (2.9)	13.74 (2.1)	14.31(2.7)	0.74	0.479
Sex of respondents F (%)	11 (19.3)	7 (12.3)	7 (12.3)	0.464	0.793
Mean weight	58.48 (12.08)		43.26 (10.30)	29.41	<0.001
Weight for age SDS	0.62 (1.40)		-0.96 (0.91)	23.38	<0.001
Mean height	153.29 (14.07)	151.37 (12.2)	154.36 (13.9)	0.73	0.48
Height for age SDS	-0.10 (1.6)	-0.99 (0.73)	-0.81 (0.88)	12.07	<0.001
Mean BMI	19.16 (2.7)	18.40 (3.1)	17.86 (1.94)	2.42	0.92
BMI for age SDS	1.11 (1.27)	-0.47 (1.21)	-0.73 (0.89)	29.26	<0.001
Socioeconomic class					
High	5	6	10		
Middle	15	36	32		
Low	10	15	16	2.045	0.727

Depression

Depression was present in the study population with 54 (37.2%) subjects having mild to moderate depression, while 91 (62.8%) were within the normal/minimal interpretive label, and the difference in proportion was significant,X^2=7.098, p=0.029. The total mean BDI score for the population was 14 ± 6.53 ranging from 1-25, with the diabetes group having the lowest score and the Sickle cell disease group having the highest score. The difference in mean BDI scores between the groups was significant, F=3.52, p=0.032, and these are shown in Tables 2 and 3. Post hoc analyses, showed that the difference in total mean scores was only significant between TIDM and SSA with mean difference of -3.55, p=0.009. There was no significant difference in the mean BDI score between SSA and HIV/AIDS group, p=0.224.

Table 2: Distribution of BDI mean scores between the 3 groups and the proportion of adolescents with suicidal ideations, stigmatization and sleep disorders.

Variable	T1DM (30)	SSA (57)	HIV (58)	F/x^2	p value
BDI – II mean (SD)	11.9 (5.40)	15.45 (6.53)	14.10 (5.5)	3.52	0.032*
	n (%)	n (%)	n (%)		
Suicidal thoughts (YES)	5 (16.7)	18 (31.6)	28 (48.3)	9.19	0.010*
Sleep disorder (YES)	6 (20.0)	12 (21.1)	8 (13.8)	1.14	0.566
Stigmatisation (YES)	9 (30)	27 (47.4)	27 (46.6)	2.79	0.248
Eating disorders (YES)	0 (0.0)	7 (12.3)	0 (0.0)		

Table 3: Frequency distribution comparing presence of depression with the study groups.

GROUPS		Depression class		Total
		no depression	mild to moderate	
TIDM	Count	25	5	30
	% within depression class	27.50%	9.30%	26.70%
	% of Total	17.20%	3.40%	20.70%
SICKLE CELL	Count	34	23	57
	% within depression class	37.40%	42.60%	39.30%
	% of Total	23.40%	15.90%	39.30%
HIV/AIDS	Count	32	26	58
	% within depression class	35.20%	48.10%	40.00%
		21.30%	17.30%	38.70%
Total	Count	91	54	145
	% of Total	62.80%	37.20%	100.00%

Children with HIV/AIDS had a higher proportion of suicidal thoughts than any other group, and only 7, (12%) children with sickle cell anaemia had eating disorders as others reported that they eat whatever and whenever they felt like.

Significant association was only seen between the BDI score and stigmatisation in the TIDM group, but the Sickle cell group had significant association between the BDI scores and stigmatisation, insomnia and suicidal thoughts. Only HIV/AIDS had significant association between the BDI score and the index used for disease severity ie CD4+ count (Table 4).

Table 4: Regression analyses of total depression scores and some items in the depression scale that showed strong association with the depression within the study groups.

Dependent	Model	Independent	B	t	p
Beck Dep (TIDM)	Adjusted R^2=0.363	Stigmatisation	-5.215	-2.348	0.027*
		Insomnia	2.871	1.26	0.219
		Suicidal thoughts	3.44	-0.809	0.22
		HbA1c	0.43	1.621	0.119
		Duration of illness	0.126	0.34	0.737
		Social class	1.775	1.171	0.253
Beck Dep (Sickle cell)	Adjusted R^2=0.737	Stigmatisation	-3.351	-3.035	0.004*
		Insomnia	10.272	0.643	0.001*
		Suicidal thoughts	6.239	5.203	0.001*
		Stable Hb	1.871	1.268	0.211
		Duration of illness	0.183	0.934	0.355
		Social class	-0.987	-0.849	0.4
Beck Dep (HIV/ AIDS)	Adjusted R^2=0.737	Stigmatisation	-2.022	-1.849	0.071
		Insomnia	5.605	2.942	0.005*
		Suicidal thoughts	4.636	3.386	0.001*
		CD4+ count	-0.001	-2.744	0.008*
		Duration of illness	-0.209	-1.198	0.237
		Social class	0.991	1.318	0.194

Discussion

In seeking ways of determining the psychological toll on children with chronic diseases, the BDI was used to test the possibility that these children may have depressive symptoms. There were 54 out of 145 children (37.2%) of children with mild to moderate depression and although this is a hospital-based study, it is high for any population. This means that 1/3rd of these children met the criteria for depression by their own report and therefore will benefit from psychologic review to help them cope better with their condition. This high prevalence may be accounted for by the fact that the subjects interviewed had chronic diseases which are quite challenging to manage in Africa and Nigeria. However, in comparing prevalence between the study groups, the children with sickle cell and HIV had higher depression scores and their prevalence of depression was higher than those with diabetes. This was in contrast to the null hypothesis that prevalence was similar in all groups.

In the children with diabetes, 5 of 30 (16.7%) had mild to moderate depression, which is similar to the study by Hood et al in USA.4 This is also similar to the lifetime prevalence rate of major depression among adults with type 1 and 2 diabetes ranging between 14.4 % and 32.5% as stated by Grey et al.[15] This is much higher than children without diabetes or other diseases and it is not surprising because illnesses exert physical and psychological stresses on patients. Depression carries a lot of disability in diabetic children knowing they cannot eat what their siblings and friends eat, have to check blood glucose as often as possible and take multiple injections daily. Some children with diabetes have disordered eating habits and indeed many of our patients eat more frequently or consume large quantities reducing their ability to control their blood glucose and insulin regimen. This is corroborated with the results where no child with diabetes had anorexia. The vicious cycle runs the course making it difficult for paediatricians to help maintain normal blood glycaemic indices of the patients. Stigmatisation is a source of depression in many patients and in this study, the proportion of stigmatized patients with diabetes was high and comparable to other studies. It correlates significantly with the level of depression. Studies from Germany, Bach et al16 found that depression was reported in a higher proportion of young adults 18-20 years.

In our cohort of children with diabetes, we found that social class, or recent HbA1c did not have significant impact or relationship with depression scores. This is in contrast to many other reports where depression in diabetes was related to the severity of diseases and socioeconomic status.[4,15,17] However, most of our patients were in the low socioeconomic class, had poor glycaemic controls and their frequency of admission were relatively the same, such that differences may have been difficult to find in this circumstance Bächle et al.[16] Also showed similar correlation with our study where HbA1c was not associated with key depressive symptoms. There is also the possibility that the social and medical support from the endocrine unit and team may have reduced the psychological toll on the patients as the drug (insulin) availability is relative constant through efforts of Life-for-A-Child foundation and their parents.[9,10] What is lacking is the glucose test strips, making their checks and controls poor with attendant long-term complications from diabetes.[18]

Children with sickle cell disease had higher mean BDI scores

than the other two cohorts of subjects and the prevalence of mild to moderate depression within the group was also the highest. High depression score was also reported by Bhatt-Poulose et al, and Sehlo et al.[19,20] The depression risk has been linked to higher stigmatization, increased out of school days, chronic and severe painful episodes and bullying. The correlation model for sickle cell and depression showed significant relationship with socioeconomic status and suicidal ideation in our cohort as with others.[3] Low socioeconomic status of patients tends to increase the risk of frequent painful crises, hospital admissions and types of medications available for use. Some children also have to undergo frequent blood transfusion for hyperhaemolytic crises and this increases their anxiety and depression levels.[5] Unlike children with HIV and Diabetes who have fair access to medications through donor agencies, children with sickle cell have little social support in Nigeria and this increases their risk to painful crises and depression.[20] Insomnia may be a frequent occurrence in children with sickle cell anaemia and this is correlated to the frequency of painful or hyperhaemolytic crises they experience.[21,22] It is suggested that depression and other psychosocial features be screened for in children with SSA so that coping skills can be taught to them to improve their self-esteem and prevent deterioration.[5,6,11]

The prevalence of mild to moderate depression in children with HIV was higher in our study than those of Lwidiko et al in Tanzania and Shiferaw et al in Ethiopia and other countries in Africa (Malawi, Kenya and South Africa).[23-25] The mean BDI score for HIV children was also high and in keeping with other studies. Like sickle cell, depression in HIV infected children is also linked to stigmatization and, (like in our model) increased disease burden depicted by CD4 count.[26-28] In Nigeria, drugs for HIV is free for children and adults,[29] however, poor adherence has been an issue and this usually leads to poor control, increased viral load and reduced CD4 counts.[30-32] Unlike other studies, socioeconomic class did not have significant association with BDI possibly because many children were in the middle and low socioeconomic class and they had similar disease severity between them. Family support and other social interventions are tools that may reduce the mental burden of the disease on children[33] Stigmatisation was high in this group and is in keeping with other studies[13,34]. While it is possible that socioeconomic class did not have significant association with BDI in our study, direct consequences of socioeconomic class like low CD4+counts did.

Conclusion

The screening tool showed a high rate of depression symptoms among children with chronic diseases in our hospital and while depression is not a common diagnosis in Nigerian children generally, it under reported. It is our recommendation that all children with any chronic disease should be screened for depressive symptoms. There should be a laid down protocol that helps these children cope with their condition to improve their primary disease condition and the depression that follows. Screening should be done annually and especially when children are reaching the adolescent years as they are more aware of self and independence is setting in.

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Disclosure

The authors report no conflicts of interest in this work

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