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Depression in scholars and adolescents carriers of acute leukemia during the treatment phase

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Abstract

Objective: *To describe depression levels in school aged children and adolescents with acute leukemia during the treatment.* **Materials and methods:** *This transversal descriptive study took place during January to September 2012 and included school aged children and adolescents, carriers of acute leukemia, in treatment at a high-ranking specialty hospital. A modified Kovacs questionnaire (CDI) was applied. They were grouped according to presence or absence of depression. Inferential statistics with c^2 and Statistical package SPSS 20.0 were used.* **Results:** *Forty-six patients were included in the study: with depression n = 43 (94%), without depression n = 3 (6%), males n = 32 (70%) and females n = 14 (30%), average age 8 years old (7-15). Acute lymphoblast leukemia was the most frequent n=42 patients (91%). Depression was found in 42 patients (91%), with nine presenting a minor level (21%), 11 a moderate level (26%), and 23 a severe level (53%). Mostly during the consolidation phase, 30 patients (70%) patients with no relapses showed a higher incidence of depression, 23 (54%) vs. with relapses 20 (47%) (p = 0.870); the majority had no family history of depression 41 (95%) vs. 2 (5%) (p = 0.017).* **Conclusions:** *We found a high percentage of severe level depression, which affected mostly male patients, suffering a relapse during the consolidation treatment phase.* (Gac Med Mex. 2015;151:174-8)

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Introduction

Acute leukemia is a heterogeneous group of conditions resulting from a disordered proliferation of a hematopoietic cells clone and are classified in two large groups: acute lymphoblastic leukemia (ALL) and acute myeloblastic leukemia (AML), which in turn are classified, according to the involved cell-line and the phenotype, in several subtypes, with the most common being ALL[1,2].

Specific treatment of acute leukemia is fundamentally based on chemotherapy, which is divided into phases or stages according to the type of acute leukemia; in the case of ALL, the treatment lasts from

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2 to 3 years and includes 4 phases: remission induction, central nervous system (CNS) treatment, intensification/consolidation and maintenance or continuation[3,4]. In the case of AML, treatment is divided into 3 phases: remission induction, consolidation and CNS therapy[3,4].

During chemotherapy treatment, the patient can experience relapses, which are defined as the reappearance of disease after having achieved complete remission[5].

Acute leukemia and its treatment have strong emotional implications in children and adolescents; treatments are very invasive, long and intensive, requiring continuous hospital visits and large amounts of home-based care[6].

The main treatment approach is chemotherapy, which has significant side-effects. Emotional response upon diagnosis occurs in three phases: an initial phase where people react with incredulity or rejection and despair, followed by a phase of dysphoria during which the patients are anxious and exhibit a depressive mood, anorexia, insomnia, irritability, poor concentration and disturbances in daily activities, and, ultimately, during the adaptation phase, the individuals adjust to the new information, confront aspects they are faced to, find reasons to be optimistic and resume their daily activities. However, some patients fail to adequately adapt and continue with depressive symptoms and, consequently, are more likely to experience mood disorders[5,6].

Depression is a common disorder in hospitalized children; it comprises a series of symptoms, with affective-type symptoms predominating (pathologic sadness, despair, apathy, anhedonia, irritability, subjective sensation of discomfort), but cognitive, volitional and physical symptoms can also occur[7]. The most widely used diagnostic criteria for depression both clinically and in investigational research are the ICD-10 and the DSM-IV-TR, criteria on which Kovacs' CDI questionnaire, modified for the detection of depression, is based. This questionnaire is the most commonly used and accepted by different experts in childhood depression. It is intended to assess depressive symptoms and it is used for assessment, research and monitoring of cases[8,9].

Davanzo et al., in 2004, validated the long and short versions of the CDI into Spanish language, and found a good index of internal consistency for the test (Cronbach's a of 0.85). Validation of the CDI scale construct was carried out in children aged from 8 to 12 years at the Childhood Psychiatry Hospital "Dr. Juan N. Navarro" of the Ministry of Health, in Mexico City, with a reported Cronbach's α of 0.86[10].

Material and methods

This was a cross-sectional, comparative trial conducted in a reference hospital of the west of the country over the months from January through September 2012. The degree of depression, age, gender, family history of depression and parental marital status, as well as type of leukemia, treatment phase and relapses, were assessed. Two groups were formed: A, patients with depression, and B, patients without depression.

Selection criteria

Pediatric patients aged from 7 to 16 years from the hospitalization and outpatient chemotherapy areas of the unit's Pediatric Hematology Department who were acute leukemia carriers and were at some treatment phase were included. Inclusion was restricted to chidren who knew how to read and whose parent or legal guardian signed the informed consent agreeing for the assessment to be carried out. Children outside of the above age range, or if the parent refused to sign the consent were excluded. Children who failed to answer the questionnaire correctly or completely were withdrawn.

Sample size calculation

It was performed using a formula for a proportion taking as a reference the article by González[11], where a prevalence of depression of 15% is established for cancer-diagnosed patients worldwide. Breaking down the formula, a minimal size of 46 patients was established. A consecutive-case non-random sampling was performed until the sample was completed.

Assessment instrument

The Spanish language-adapted CDI questionnaire (©1992 Kovacs ©2004 Davanzo)[10] was used. This questionnaire is comprised by 27 items with a Likert-type format with 3 alternative answers: 0-1-2 (0 = normality or absence of symptoms), 1 = moderate symptom, 2 = severe symptom). Final score is obtained by adding the values for each item; hence, the higher the score, the higher the severity of depressive symptoms, with a maximum score of 54. The questionnaire is applied in 10-15 min. As the depression diagnosis cutoff point, a score of 19 is established, when it comes to data collected from a large sample with general characteristics; for clinical purposes, the cutoff point is established at 12 or 13. Depression is classified as follows: ≤ 6 points:

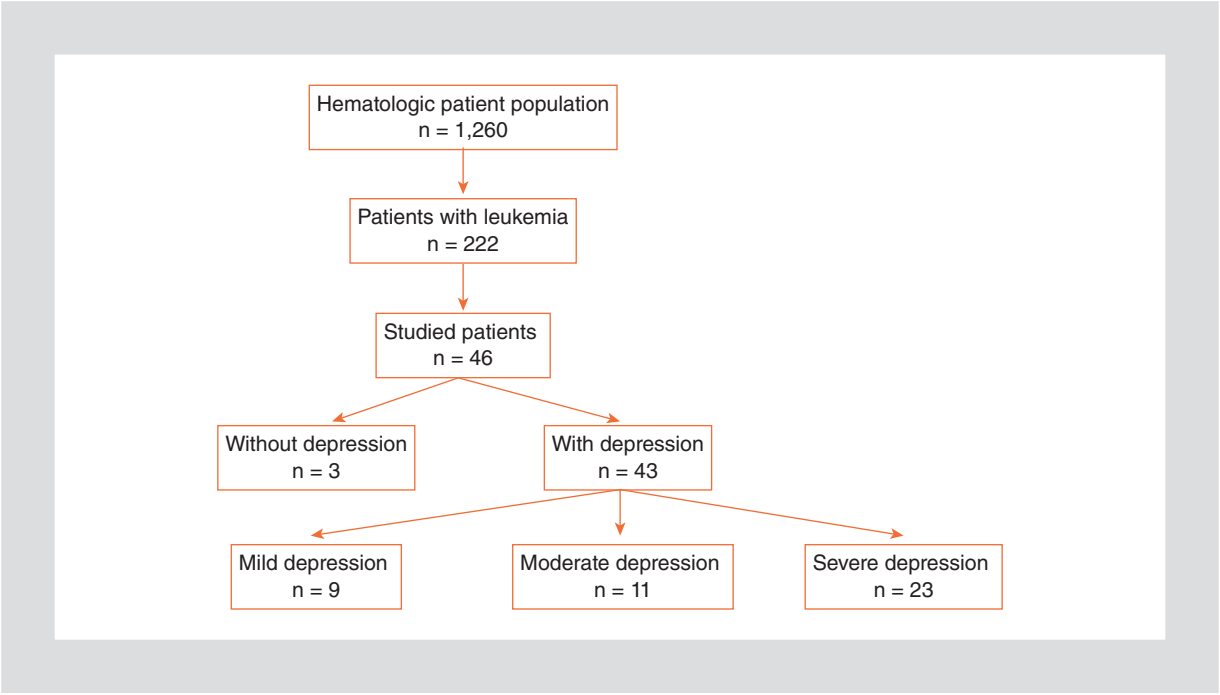

Figure 1. *General profile of the study of depression in children with leukemia.*

no depressive symptoms; 7-13 points: mild depressive symptoms; 14-19 points: moderate depressive symptoms; and ≥ 20 points: severe depressive symptoms.

Procedures

The database of the department was reviewed in order to identify acute leukemia carrying patients. Parents and patients were explained on the study procedures, and their authorization to complete the CDI questionnaire for the diagnosis of depression was asked by means of the informed consent. Children hospitalized at the Hematology Department were applied the CDI questionnaire at bedside and in the outpatient chemotherapy area, with the father or mother present. The questionnaire was applied by healthcare professionals (trained pediatrics residents). The patients completed the CDI questionnaire once they were explained the procedure and by using an example. After being answered, the questionnaire was graded, and the patient and the family member were informed on the result. Then, depending on the result, they were explained on the steps to be followed: if the result was positive for depression, the patient was referred to the Paidopsychiatry and Psychology Department of the hospital for assessment and management. The result was reported in the case report form. Subsequently, the information was captured in the database.

Statistical analysis

Qualitative variables were analyzed by means of frequencies and percentages, and quantitative variables with medians and ranges (minimum and maximum value). An electronic database was created using the Microsof Office 2010 Excel program, and for data analysis, the statistical program SPSS, version 20.0 for Windows, was used.

Ethical considerations

The study adhered to the international principles of research established in the Declaration of Helsinki of 1975. The parents or legal guardians of the patient were asked to sign the informed consent for the CDI questionnaire to be applied. Non-inclusion in the study did not influence on diagnostic or therapeutic approaches. The protocol was approved by the Local Research and Ethics Committee 1302 of the hospital with the registry number R-2012-1302-42.

Results

The hospital had a population of 1,260 patients diagnosed with hematological pathologies; out of them, 222 children (17%) were diagnosed with leukemia. Only 46 patients (21%) who met the selection criteria were studied (Fig. 1).

Table 1. Clinical and sociodemographic characteristics of the studied schoolchildren and adolescents with leukemia in treatment phase

Characteristic	Value (n = 46)
Gender, male/female, n (%)	32 (70)/14 (30)
Age in years, median (range)	8 (7-15)
Parental marital status	
Married, n (%)	41 (89)
Single, n (%)	1 (2)
Civil union, n (%)	3 (7)
Widowed, n (%)	1 (2)
Family history of depression, n (%)	4 (9)
Type of leukemia	
ALL, n (%)	42 (91)
AML, n (%)	4 (9)
Treatment phase	
Induction, n (%)	12 (26)
Maintenance, n (%)	2 (4)
Consolidation, n (%)	32 (70)
Patients with relapses, n (%)	21 (46)

Demographic characteristics of the studied patients are described in table 1. We observed a higher frequency in children of the male gender. The profile of the disease is observed especially in boys with ALL, mainly in the consolidation phase. Family history of depressive disorders was found in 9% of the population.

Table 2 shows patient characteristis according to the presence or absence of depression. We found no relevant differences in both groups when the type of leukemia, treatment phase or disease relapses were analyzed. Conversely, statistically relevant differences are observed in presence of a family history of depression. Ninety-five percent of the children with depression had no family history of this disorder, with a statistical difference with a p-value = 0.017. The remaining differences, such as type of leukemia, treatment phase (Fig. 2.) and the presence of disease relapses were not significant.

Table 3 shows important background factors according to the degree of depression experienced by the children; significant differences are only found in family history of depression. The goups behaved equally with regard to the occurrence of relapses, gender, parental marital status and age at presentation.

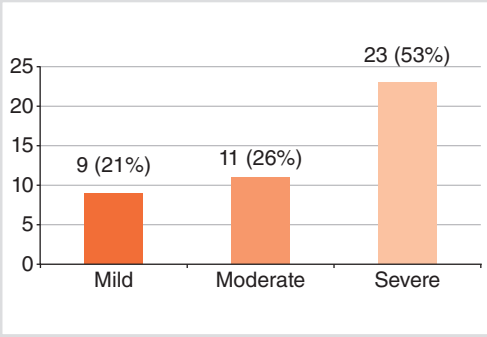

Figure 2. *Degree of depression in children and adolescents with acute leukemia on treatment phase.*

Table 2. Distribution of children and adolescents with leukemia on treatment phase according to the presence of depression*

Characteristic	With depression (n = 43)	Without depression (n = 3)	p-value
Type of leukemia			0.756
ALL, n (%)	39 (91)	3 (100)	
AML, n (%)	4 (9)	0	
Phase of treatment			0.901
Induction, n (%)	11 (26)	1 (33)	
Maintenance, n (%)	2 (4)	0	
Consolidation, n (%)	30 (70)	2 (67)	
Family history of depression			0.017
Present, n (%)	2 (5)	2 (67)	
Absent, n (%)	41 (95)	1 (33)	
Relapse			0.870
With relapse, n (%)	20 (47)	1 (33)	
Without relapse, n (%)	23 (53)	2 (67)	

*Comparison of proportions with Fischer's exact chi-square test.

Table 3. Level of depression by adverse conditions in children and adolescents with acute leukemia on treatment

Condition	Mild (n = 9)	Moderate (n = 11)	Severe (n = 23)	p-value
Family history of depression, n (%)	2 (22)	0	0	0.017
Relapse of leukemia, n (%) 5 (56)	5 (56)	4 (36)	11 (48)	0.810
Male/female gender, n (%)	7/2 (78/22)	6/5 (55/45)	18/5 (78/22)	0.247
Marital status: not married, n (%)	3 (33)	2 (18)	1 (4)	0.372
Age younger than 11 years, n (%)	6 (67)	9 (82)	13 (56)	0.153
Age older than 12 years, n (%)	3 (33)	2 (18)	10 (44)	0.282

Discussion

The purpose of this study was to assess the levels of depression in leukemia-diagnosed patients at different treatment phases and to find out if there was influence of any variables such as age, sex, family history of depression, parental marital status, type of leukemia and relapses, among others, on the development of depression.

Data obtained are consistent with those reported in literature. The variability of results obtained in previous studies is probably due to the different instruments used to establish the diagnoses. In the studies by González in 2006[11], Cavosoglu in 2001[12] and Rodríguez Candiles et al. in 2008[13], depression percentages of 15, 22 and 42% were obtained, respectively; in our case, we obtained a percentage of depression of 93.5% in patients with leukemia. With regard to patient sociodemographic characteristics, Allen et al., in 1997[14], conducted a study that included the age, sex and time elapsed since the baseline diagnosis variables, and found no significant differences in the development of depression. Essau et al., in 1995[16], did not find gender differences in the occurrence of depressive symptoms. Cabrera et al., in 2005[16], reported a higher percentage of depression in the male gender, which is consitent with findings in our study. In that same study, Cabrera et al.[16] reported that, in different age groups, the age variable did not influence on the development of depression, the same as in our study. In the trial conducted by Cavusoglu in 2001[12], a higher percentage of moderate depression was reported, with 12%; this was not the case in our study, since we found a higher percentage of severe depression.

With regard to the treatment phases, we observed a higher percentage of depression in the consolidation phase, in contrast with the study conducted by Mulhern et al. in 1994[17], where higher percentage is reported in the remission phase.

As to relapses as a determinant, no studies were found referring the subject; according to our results, patients with relapses while on treatment did not experience depression more frequently.

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