Evaluation of depression and anxiety in parents of children undergoing cardiac catheterization

Kalp kateterizasyonu yapılan çocukların anne ve babalarında depresyon ve anksiyetenin değerlendirilmesi

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ABSTRACT

Objective: This study aimed to determine pre-procedure depression and anxiety levels among a group of parents whose children had congenital heart disease and were undergoing angiography.

Methods: The study comprised parents of 73 congenital heart disease patients undergoing angiography. The Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI) were used to evaluate the depression and anxiety scores.

Results: Sixty-one patients (83.6%) had acyanotic congenital heart disease, and 25 patients (34.2%) were undergoing diagnostic angiography. BDI scores among the mothers determined that 8 (11%) had mild, 14 (19.2%) moderate, and 10 (13.7%) severe depression. Their BAI scores showed that 16 (21.9%) had mild, 8 (11%) moderate, and 13 (17.8%) severe anxiety. BDI scores for the fathers showed that 12 (16.4%) had mild, 10 (13.7%) moderate, and 8 (11%) severe depression. Their BAI scores showed that 12 (16.4%) had mild, 10 (13.7%) moderate, and 8 (11%) severe anxiety. A comparison of mothers of cyanotic patients and those of acyanotic patients in terms of depression and anxiety levels revealed a statistically significant difference (p=0.050 and 0.043, respectively).

Conclusion: Angiography was associated with increased levels of depression and anxiety in parents of children with congenital heart diseases. In comparison to parents of patients with acyanotic congenital heart disease, mothers of patients with cyanotic congenital heart disease had significantly higher levels of depression and anxiety.

ÖZET

Amaç: Anjiyografi yapılan doğumsal kalp hastalığı olan çocukların ebeveynlerinde işlem öncesi depresyon ve anksiyete seviyesinin belirlenmesi.

Yöntemler: Doğumsal kalp hastalığı olan ve anjiyografi yapılan 73 çocuğun ailesi çalışmaya dahil edildi. Değerlendirmede Beck depresyon envanteri (Beck Depression Inventory - BDI) ve Beck anksiyete envanteri (Beck Anxiety Inventory - BAI) ölçekleri kullanıldı.

Bulgular: Hastaların 61'inde (%83.6) siyanozsuz doğuştan kalp hastalığı vardı. Tanısal anjiyografi hastaların 25'ine (%34.2) yapıldı. BDI ölçeği ile annelerin 8'inde (%11) hafif, 14'ünde (%19.2) orta ve 10'unda (%13.7) ağır depresyon saptandı. BAI ölçeği ile annelerin 16'sında (%21.9) hafif, 8'inde (%11) orta ve 13'ünde (%17.8) ağır anksiyete saptandı. BDI ölçeği ile babaların 12'sinde (%16.4) hafif, 10'unda (%13.7) orta ve 8'inde (%11) ağır depresyon saptandı. BAI ölçeği ile babaların 12'sinde (%16.4) hafif, 10'unda (%13.7) orta ve 8'inde (%11) ağır anksiyete bulundu. Siyanozlu hastaların annelerinin depresyon ve anksiyete seviyeleri siyanozsuzlara göre istatistiksel olarak belirgin yüksek bulundu (sırasıyla, p=0.050 ve 0.043).

Sonuç: Anjiyografi işlemi doğumsal kalp hastalığı olan çocukların ebeveynlerinde depresyon ve anksiyetenin artışına neden olur. Siyanozlu doğumsal kalp hastalığına sahip hastaların annelerinde depresyon ve anksiyete oranı anlamlı olarak daha fazladır.

Congenital heart disease can result from many abnormalities of the cardiovascular system arising during in utero development. Cardiac catheterization is used in both the diagnosis and treatment of congenital heart disease. While the diagnostic need for cardiac catheterization and angiography has dimin-

Received: November 30, 2014 *Accepted:* February 17, 2015
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ished with the development of non-invasive methods for diagnosing congenital heart disease, the frequency and variety of interventional therapeutic catheterizations and angiography procedures has increased.[1]

Families having a child with a chronic disease face changes in their physical, emotional and economic stability. These changes can prevent families from enjoying life, thus reducing their quality of life.[2]

The aim of this study was to determine the premedical procedure depression and anxiety levels of mothers and/or fathers whose children were seen at the Department of Pediatric Cardiology in our university hospital between January and May 2014 and underwent angiography because of congenital heart disease.

METHODS

The parents of 73 children who underwent angiography between January and May 2014 and who agreed to participate were included in the study, approved by the local ethics committee. The parents of children undergoing angiography were included in the study if they provided consent, did not have any previously diagnosed psychiatric illnesses, and were literate. Six families did not meet the inclusion criteria and were excluded from the study.

We used the Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI) for evaluation.[3] The BDI and the BAI comprise 21 questions each, with every question being scored from 0-3.[3] Both yield scores ranging from 0 to 63. The BDI scores are distributed as follows: <10 normal, 10–16 mild depressive symptoms, 17–29 moderate depressive symptoms, and 30–63 severe depressive symptoms. The Beck Anxiety Inventory scores are distributed as follows: <8 normal, 8–15 mild anxiety symptoms, 16–25 moderate anxiety symptoms, and 26–63 severe anxiety symptoms.

Prior to angiography, the parents were informed about the procedure, and were asked to fill out the depression and anxiety inventories on the day before the procedure. They were asked to read all the statements and select the answer that was closest to what they had been feeling. We did not apply any time limitations for reading and answering the questions. To determine parents' depression and anxiety levels, the results were evaluated with the assistance of the Department of Adult Psychiatry, from which a psychiatrist who did not have any information on the patients scored the inventories. It takes about 15 minutes to fill out the inventories, but this time may vary depending on the patient's level of education. Both the BDI and the BAI were translated into Turkish, and appropriate validity and reliability studies were carried out.[4]

Abbreviations:

BAI	*Beck Anxiety Inventory*
BDI	*Beck Depression Inventory*
NCS	*The American National Comorbidity Study*

Statistical analyses

The Kolmogorov-Smirnov test was used to determine whether the continuous variables were normally distributed. The Mann-Whitney U test was used for non-normally distributed variables. The Wilcoxon test was used for non-normally distributed variables when comparing two dependent groups. However, we used the Kruskal-Wallis test and Dunn's multiple comparison test to compare more than two independent groups. The relationship between the categorical variables was tested with the chi-square analysis and the Kappa test. The descriptive statistics are given as mean±standard deviation, numbers and percentage values. The SPSS for Windows version 22.0 software package was used for statistical analyses and $p<0.05$ was considered statistically significant.

RESULTS

Mean age among the patients who underwent angiography was 61.9±50.7 months, mean age among the mothers was 31.8±7.8 years, and mean age of the fathers was 36.1±8.5 years. Sixty-one of our patients (83.6%) had acyanotic, and 12 (16.4%) had cyanotic congenital heart disease. Diagnostic angiography was performed on 25 patients (34.2%) and therapeutic angiography on 48 patients (65.8%; Table 1).

Among the 73 patients who underwent angiography, distribution of congenital heart disease was as follows: 21 (28.8%) had an atrial septal defect, 20 (27.4%) had a patent ductus arteriosus, 7 (9.6%) had pulmonary stenosis, 5 (6.8%) had coarctation of the aorta, 4 (5.5%) had tricuspid atresia, 3 (4.1%) had a ventricular septal defect, 3 (4.1%) had aortic stenosis, 3 (4.1%) had transposition of great arteries, 2 (2.7%) had mitral atresia, 2 (2.7%) had tetralogy of Fallot, 1 had anomalous pulmonary venous return, 1 had anomalous left coronary artery caused by the pulmonary artery, and 1 had Ebstein's anomaly.

Table 1. Demographic characteristics of patients

	Age	n	%	Mean±SD
Patient (months)	5–216			61.9±50.7
Mother (years)	20–54			31.8±7.8
Father (years)	22–59			36.1±8.5
Patient gender				
Female		31	42.5	
Male		42	57.5	
Cyanotic and acyanotic congenital heart disease				
Acyanotic		61	83.6	
Cyanotic		12	16.4	
Diagnostic or therapeutic catheterization				
Diagnostic		25	34.2	
Therapeutic		48	65.8	

BDI and BAI scores for the patients' parents showed mean depression scores for the mothers and fathers as 13.1±13.7 and 12.1±13.8 respectively, with mean anxiety scores for each at 11.6±12.3 and 9.5±1.11. The scores and their ratings for both inventories are provided in Table 2.

A comparison of mothers' and fathers' depression levels showed high agreement (kappa=0.708, p=0.001), while the comparison of anxiety levels indicated moderate agreement between them (kappa=0.571, p=0.001).

When we compared the effects of the type of angiography (diagnostic or therapeutic) on depression and anxiety, we found that the p values for depression and anxiety for the mothers were insignificant (15.2±16.1 *vs.* 12±12.3 for depression score and 12.7±14.0 *vs.* 11.1±15.1 for anxiety score, p=0.653 and p=0.977, respectively). The p values of the angiography-associated depression and anxiety for the fathers were also insignificant (13.9±15.7 *vs.* 11.2±12.7 for depression score, 10.6±10.7 *vs.* 8.9±11.4 for anxiety score, p=0.721 and p=0.462, respectively). None of the p

Table 2. Depression and anxiety evaluation of parents

	Mother			Father		
	n	%	Mean±SD	n	%	Mean±SD
Depression evaluation						
Score			13.1±13.7 (0–63)			12.1±13.8 (0–63)
Normal	41	56.2		43	58.9	
Mild	8	11		12	16.4	
Moderate	14	19.2		10	13.7	
Severe	10	13.7		8	11	
Anxiety evaluation						
Score			11.6±12.3 (0–45)			9.5±11.1 (0–45)
Normal	36	49.3		43	58.9	
Mild	16	21.9		12	16.4	
Moderate	8	11		10	13.7	
Severe	13	17.8		8	11	

Table 3. Comparison of anxiety and depression scores associated with diagnostic and therapeutic angiography

	Diagnostic angiography (n=25)	Therapeutic angiography (n=48)	*p*
	Mean±SD	Mean±SD	
Mothers' depression score	15.2±16.1	12±12.3	0.653
Mothers' anxiety score	12.7±14.0	11.1±15.1	0.977
Fathers' depression score	13.9±15.7	11.2±12.7	0.721
Fathers' anxiety score	10.6±10.7	8.9±11.4	0.462

Table 4. Comparison of anxiety and depression scores among parents of children undergoing angiography because of cyanotic versus acyanotic congenital heart disease

	Cyanotic patients (n=12)	Acyanotic patients (n=61)	*p*
	Mean±SD	Mean±SD	
Mothers'depression scores	19.2±14.2	11.8±13.7	0.050*
Mothers' anxiety scores	15.3±18.2	10.9±11.4	0.049*
Fathers' depression scores	18.3±14.4	10.9±13.5	0.078
Fathers' anxiety scores	15.3±13.2	8.3±10.4	0.034*

*Statistically significant.

values were statistically significant (Table 3).

Furthermore, we compared the effects of cyanotic versus acyanotic congenital heart disease on the parents' depression and anxiety scores. We found statistically significant differences in the depression and anxiety scores for the mothers of cyanotic versus acyanotic patients (19.2±14.2 *vs.* 11.8±13.7 for depression scores, 15.3±18.2 *vs.* 10.9±11.4 for anxiety scores, p=0.050 and p=0.049, respectively). Although there were no statistically significant differences in the depression scores among the fathers of cyanotic versus acyanotic patients, the difference in the fathers' anxiety scores was statistically significant (18.3±14.4 *vs.* 10.9±13.5 for depression scores, 15.3±13.2 *vs.* 8.3±10.4 for anxiety scores, p=0.078 and p=0.034, respectively). These results show that the mothers and fathers of cyanotic congenital heart disease patients had significantly higher depression scores compared to the parents of acyanotic congenital heart disease patients. Furthermore, the mothers of cyanotic congenital heart disease patients had significantly higher anxiety scores compared to the mothers of acyanotic congenital heart disease patients (Table 4).

DISCUSSION

In this study, we evaluated depression and anxiety levels among a group of parents whose children were undergoing angiography as a result of congenital heart disease. Diseases in a child bring a great amount of stress and pressure to bear on a family. Mothers often feel obligated to meet all the child's needs and have a difficult time accepting the situation; therefore, they are more affected than fathers are by their children's illness.[2,5] This situation causes mothers to feel inadequate, which may lead to depression and anxiety.[6] The fear of losing a child can cause grief, worry and anger in the family.[7] The presence of a chronic disease in a child can change the family's physical, emotional and economic stability, which can prevent the families from enjoying their lives and consequently reduce their quality of life.

The BDI has the advantages of being patient-completed, simplicity of language and ease of evaluation. However, its disadvantage is that women, the elderly, adolescents, people with low educational levels and people who have comorbid psychiatric disorders have been reported as scoring high.[3] The Epidemiological

Catchment Area (ECA) study conducted in the United States in 1991 reported a 4.9% lifetime incidence and prevalence rate of severe depression.[8–10] We believe that the higher rates of severe depression detected in our study might be associated with the fact that the participants' children had congenital heart disease and were undergoing angiography. Lawoko et al.[11,12] compared depression and anxiety levels among parents of children with congenital heart disease and a control group of parents of healthy children. Similarly to our study, they found that parents of children with congenital heart disease had significantly higher anxiety and depression levels; however, in Lawoko et al.'s study, the parents' total depression rate was 18%, while in our study the total rate of depression was 57.2%.[11] We believe that the significant differences in the levels reported by these two studies may be accounted for by variations among countries.

The American National Comorbidity Study (NCS) conducted in the United States in 2001 and 2002 used a different evaluation method and reported the lifetime prevalence of severe depression to be as high as 17.1%.[9] Higher depression levels in parents whose children are undergoing angiography for congenital heart disease compared with the general population can be explained by the emotional breakdown, worry and anxiety related to the child's illness.

According to NCS data, the lifetime prevalence of anxiety in women is 30.5%, while in men it is 19.2%.[9] Lawoko et al.[11,12] reported a 15% anxiety rate in parents of children with heart diseases, while in our study, this rate was 46.2%. We believe that, similarly to the depression levels, the increased anxiety levels of the participants in our study were associated with the scheduled angiography procedure.

Prior to conducting our study, we predicted that depression and anxiety levels would be higher in families whose children were undergoing therapeutic angiography compared with those undergoing diagnostic angiography. The pre-angiography preparations were the same for both procedures, and therefore, the parents paid similar attention in both cases, which might explain why the anxiety and depression levels were similar in both groups. We believe that the act of angiography itself, rather than the process involved, might have caused the families' anxiety and uneasiness.

When we compared the anxiety and depression levels of the mothers whose children were diagnosed with cyanotic versus acyanotic congenital heart disease, we found that the mothers of children with cyanotic congenital heart disease had significantly higher anxiety and depression levels. In contrast, there was no significant difference in depression scores among the two groups of fathers. In our society, it is largely expected that children's care and physiological needs are met by mothers. Mothers spend more time with children and are more invested in the treatment process; therefore, children's health problems tend to create more anxiety and stress in mothers. The clinical manifestations of cyanotic diseases may affect patients' quality of life more than those of acyanotic diseases. Many children with acyanotic heart diseases do not appear to be sick, while the cyanotic appearance, clubbing, and hypoxic episodes or bleeding disorders among children with cyanotic heart diseases are dramatic manifestations that may cause stress for the child's mother. We believe that such presentations may lead to a higher rate of emotional collapse, depression and anxiety among mothers as a result of fear for their child's life. We think that psychiatric support may help parents more easily overcome the stress, anxiety and difficulties that occur during treatment of their children.

In conclusion, we found that, in Turkey, depression and anxiety levels among parents whose children are undergoing angiography because of congenital heart disease were significantly higher than those of the normal population. This is the first report in the literature that shows higher depression and anxiety levels in parents of children diagnosed with cyanotic congenital heart disease. Previous studies have reported that parent education programs reduces stress and increases life satisfaction and quality of life.[13,14] Similar programs and types of studies should be conducted in our country.

Conflict-of-interest issues regarding the authorship or article: None declared

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Keywords: Angiography; anxiety; congenital heart disease; depression; family.

Anahtar sözcükler: Anjiyografi; anksiyete; doğumsal kalp hastalığı; depresyon; aile.