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Can Chest Pain Be Accepted A Sign of Anxious Disorders in Children ?

Çocuklarda Göğüs Ağrısı Anksiyöz Hastalıkların Belirtisi Olabilir Mi ?

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Öz

Amaç: Göğüs ağrısı çocuklarda, ergenlerde yaygın bir şikayettir ve sık acil servis başvurusuyla birlikte ileri testler yapılmasına neden olur. Bu çalışmada, çocuklarda genel anksiyete, kalp odaklı kaygı ve nonkardiyak göğüs ağrısı (NCCP) arasındaki ilişkinin irdelenmesi amaçlanmıştır. Bu değerlendirme ile olası psikolojik rahatsızlığı öngörme ve gereksiz tıbbi testlerden kaçınma sağlanabilecektir.

Yöntem: Bu prospektif vaka kontrol çalışmasında, göğüs ağrısı şikayetleri ile pediatrik kardiyolojiye başvuran ve tıbbi bir patoloji tespit edilmeyen olgular çalışma grubunu oluştururken (n:73), göğüs ağrısı şikayeti ve sistemik rahatsızlığı bulunmayan olgular ise kontrol grubu olarak belirlendi (n: 26). Her olguya Beck Anksiyete Ölçeği (BAI) yapıldı, göğüs ağrısı olan çalışma grubuna ise ayrıca Kardiyak Anksiyete Ölçeği (CAQ) uygulandı.

Bulgular: Elli altı hastanın (% 76.7) toplam BAI skoru 22 ve üzerinde idi. Çalışma ve kontrol grubu arasındaki BAI puanları arasında istatistiksel olarak anlamlı fark bulundu ($p < 0.001$). CAQ'nun üç alt ölçeği (korku, dikkat ve kaçınma) genel kaygı ile yüksek korelasyona sahipti. CAQ için Cronbach alfa değeri olan 0.834, iç tutarlılık için tatmin edici bir rakam olarak tespit edildi.

Sonuç: Bu ön çalışma sonucu, nonkardiyak göğüs ağrılı çocuklarda, anksiyete bozukluklarının öngörülenden daha yaygın olduğunu düşündürmektedir. İdiyopatik göğüs ağrısı olgularının çoğunda da psikolojik bir rahatsızlık olabileceği, bu nedenle göğüs ağrısı bulunan çocukların bir psikiyatriste yönlendirilmesi önerilmektedir. Çalışmamız, çocukluk çağı göğüs ağrılarında, CAQ kullanan ilk çalışma olması nedeniyle de önem taşımaktadır.

Keywords: Anksiyete, çocuk, adölosan, göğüs ağrısı.

Abstract

Objective: Chest pain is a common complaint in children and adolescents, accounting for numerous emergency visits and leading to a wide range of testing. In this study we sought to determine general anxiety, heart-focused anxiety and their relationship among children with non-cardiac chest pain (NCCP). This assessment provides to predict a possible psychological disorder and avoid unnecessary further medical testing.

Method: In this prospective case-control study, all patients aged 10-18 years old who were referred pediatric cardiology with a complaint of chest pain and showed no evidence of obvious medical pathology (n:73) were selected for study group. Also cases who had no chest pain or cardiac disease were accepted as control group (n:26). Each case was interviewed with using Beck Anxiety Inventory (BAI) and patients with chest pain were also interviewed with Cardiac Anxiety Questionnaire (CAQ).

Results: Fifty-six patients (76.7%) had high BAI scores with a total score of 22 and above. Statistically significant difference was found between BAI scores of study group and control group ($p < 0.001$). CAQ's all three subscales (fear, attention and avoidance) were highly correlated with indicators of general anxiety. Cronbach's alpha for CAQ was 0.834, indicating satisfactory internal consistency.

Conclusion: The results of this preliminary study suggest that anxiety disorders are more common than predicted in children with NCCP. We believe that most idiopathic chest pain cases have an underlying psychological disorder especially anxious disorder therefore referring to a psychiatrist is suggested. Our study also should take a worthy of particular attention because of being the first study that use CAQ in pediatric clinical practice.

Keywords: Anxiety, children, adolescent, chest pain.

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Introduction

Chest pain is one of the most common complaints in emergency department that needs to be directed to a pediatric cardiologist after heart murmurs[1]. Idiopathic chest pain is one of the main reasons for chest pain and the incidence of it was reported as 21-59%. The incidence of positive cardiac findings in children and adolescents are much lower and range from 4% to 6% [2]. Although medical studies defend that only a small percentage of the cases had clear psychological problems, high levels of anxiety disorder have been documented in children and adolescents with non-cardiac chest pain (NCCP) and in their parents[3-6]. Children and families generally perceive chest pain as "heart pain". Recurrent symptoms also lead children and their families to return for additional medical testing. In the literature, it has been found that main factor in the development and persistence of NCCP in adults is Heart Focused Anxiety (HFA)[7]. Elevated HFA in patients with NCCP is associated with higher reported levels of pain, functional impairment and health care seeking [8,9]. Research on HFA has been spread by the development of the Cardiac Anxiety Ouestionnaire (CAQ)[10]. It is also illustrated by several studies that CAQ is a useful measure of HFA in patients with NCCP, and furthers, that CAQ lower order factors are related to health-related outcomes in adults with NCCP[11-13]. But to our knowledge, there is no study using CAQ to assess HFA in pediatric age in the literature.

In the current preliminary study, we assessed general anxiety level and HFA in a sample of children and adolescents were referred to a pediatric cardiologist for evaluation of chest pain who were referred for cardiac evaluation and showed no evidence of cardiac disease or any other disorder. This study's aim is to investigate the validity of CAQ as a screening test to assess HFA in pediatric age to avoid further evaluation of the patient and waste of time.

Methods

A total of 112 patients aged 10-18 years of age who were referred to pediatric cardiology practice because of chest pain constituted the study group. All participants were screened with a detailed procedure including history, physical exam, electrocardiogram, transthorasic echocardiogram and were also evaluated for other possible causes of chest pain including gastroeusophageal reflux, costochondritis and pneumonia. Patients who showed no evidence of obvious medical pathology (n:73) were considered eligible for the study group. Thirty nine patients with detected organic pathology were excluded from the study group. Also the cases who were referred pediatric cardiology practice other than chest pain innocent murmur, sports participation etc. (n:26) and found to have neither cardiac nor systemic disease formed the control group . The patients and their parents were were clearly informed about the study by the physician and informed consent was introduced. The CAQ and Beck Anxiety Inventory (BAI) were introduced to all participants in the study. The CAQ scores and BAI scores of the study group and control group were statistically compared

Cardiac Anxiety Questionnaire (CAQ): There are 18 questions in CAQ and it measures the heart-focused anxiety. Participants are asked to indicate how often they currently experience certain heart-related concerns on a 5-point Likert-type scale (0 =never; 4 = always). Higher scores indicate greater HFA. This measure has demonstrated good psychometric properties in a number of cardiac patient samples (10,12). Because this is the first study using CAQ on Turkish children, the original questionnaire was translated into Turkish by two of the authors.

Beck Anxiety Inventory (BAI): BAI is a self-repot measurement that has 21 questions. Items were rated on a 4-point scale. A score of 16 or above indicates anxiety [14]. Interviews were performed during the patient's pediatric cardiology policlinic visit by the clinician then were evaluated by a psychologist with prior experience assessing childhood anxiety disorders.

Statistical Analysis

The data were recorded with the Statistical Package for the Social Sciences program version 21 (Spss, Inc., Chicago, IL, USA). The variables were investigated using analytical methods Kolmogorov Smirnov/Shapiro- Wilk's test to determine whether or not they are normally distributed. The descriptive statistics were defined as mean ± standard deviation for normally distributing data and as median (minimum–maximum) for

non-normally distributing data. The significance of the differences in median values between two independent groups was analyzed with the Student t-test, and the differences in mean values between more than two independent groups were analyzed with one-way variance analysis (ANOVA). While investigating the asssociations between non normally distributed and/or ordinal variables , the correlation coefficients and their significance were calculated using the Spearman test. Reliability procedure was performed in the analysis of the data of CAQ. In this direction, Cronbach alpha coefficient which is most suitable for Likert type scales is calculated.

Results

A total of 99 patients participated in this study. 51.5 % of the participants were female and 48.5 % were male. Age of patients were ranged from 10 to 18 years (14.2±2.3 years). Demographic features of participants were showed in Table 1. Means, standard deviations, and minimum-maximum scores for BAI were calculated in all participants and each CAQ subscale were calculated only in study group (Table 2).

Table 1. Demographic features of participants (n:99)

	Study group (n: 73)	Control Group (n: 26)	p
Gender	32 (43.8%) male	16 (61.5%) male	0.12
Age (years)	14.4 ±2.2*	13.4±2.76	0.22
BAI score	32. 6±14	5.8±4.8	<0.001

**Values are presented in mean±SD*
BAI: Beck Anxiety Inventory

There was no difference in age and sex between groups. Statistically significant difference was found between BAI scores of study and control group (p< 0.001). Study group had higher BAI scores than control group. Moreover, anxiety with a BAI score of 16 or higher was detected in 83.6 % of patients versus 3.8 % in controls.

Table 2. Descriptive statistics of measurements in study group (n= 73)

	MIN	MAX	MEAN	STANDARD DEVIATION
CAQ FEAR	0.63	4.00	2.45	0.89
CAQ AVOIDANCE	0.00	4.00	2.42	1.22
CAQ ATTENTION	0.00	3.80	1.60	0.88
BAI	4.00	63.00	32.36	14.05

In study group, reliability analysis was conducted and Cronbach's alpha values (α) for CAQ subscales (fear, avoidance, and heart focused attention) were calculated and found as 0.84, 0.83, and 0.71; respectively. The Correlation Coefficient (r) was calculated to test the relationship between BAI and CAQ subscales. Pearson's bivariate correlations between BAI and CAQ subscales showed that, BAI was positively correlated with fear (r = 0.76, p< 0.001), avoidance (r =0.46, p< 0.001) and heart-focused anxiety scores (r = 0.68, p< 0.001). Differences between boys and girls in BAI and CAQ were analyzed with one-way ANOVA. The main effect of fear was marginally significant (F (1, 71) = 3.39, p= 0.07). Girls (mean = 2.69, SD = 0.89) had more fear than boys (mean = 2.24, SD = 0.87). The main effect of avoidance was significant (F (1, 71) =6.29, p<0.05). Compared to boys (mean= 2.72, SD = 0.18), girls (mean= 2.02, SD = 0.21) had higher avoidance scores. There was no difference between boys and girls in heart focused attention (F (1, 71) =2.92, NS). The main effect of BAI was also significant (F (1, 71) = 6.21, p< 0.05). Girls (mean=35.85, SD = 14.42) had more anxiety than boys (mean = 27.87, SD = 12.39).

Discussion

Chest pain in children and adolescents is one of the main cause of anxiety as demonstrated in many studies [1-15-16]. Fear of sudden cardiac death has been increasing and people restrict their activities and consult to doctors frequently because of this fear. Taking the medical

history and and detailed physical examination are very important. After that, systematic psychiatric screening could increase the detection of psychiatric disorders and prevent excessive laboratory testing. Medical studies about pediatric NCCP argue that just small part of the cases have psychological problems[16-17]. Therefore, NCCP cases are categorized in medical studies as idiopathic or musculoskeletal. Findings of the current study revealed that anxiety disorders are common in adolescents with NCCP since participants reported high levels of physical symptoms such as chest pain, dizziness, shortness of breath, and palpitations. These findings show the importance of psychiatric screening in children and adolescences with NCCP. Improved detection of psychiatric disorders provides the proper treatment of NCCP. Moreover, NCCP itself, causes distress and impairment in patients independently of psychiatric pathology. McDonnell et al. have emphasized the importance of child and familial factors that can lead to onset and persistence of NCCP[18].

In addition to this pediatric study, HFA has been proposed as a key factor in the development and persistence of NCCP or chest pain without a detectible cardiac origin in adults[7]. Although, there is no study evaluating HFA in pediatric age, results of our study demonstrated that children with NCCP had high CAQ scores. CAQ's all three (fear, avoidance, attention) subscales'scores highly correlated with BAI scores, singly.

A current pediatric study with 194 cases also found higher depression levels and higher BAI scores in children aged 11-18 years with chest pain compared with controls and referring patients to a psychiatrist is suggested[19]. In our study, compatible with literature, anxiety was detected in 83.6 % of patients versus 3.8 % in controls.

These results highlight that cardiac symptoms are a component of general anxiety in children with NCCP as chest pain is recognized as heart pain by children and their families. High CAQ scores also explained the persistence of symptoms in children with NCCP.

Conclusion: Follow-up assessments by a psychiatrist of children with chest pain should be conducted, because many cases being categorized as "idiopathic" or "musculoskeletal" might be associated with some undiagnosed psychological disorders. We believe that before referring to a psychiatrist CAQ and BAI are useful preliminary tests to assess these patients.

There were several limitations of this preliminary study. At first , the sample size was very small as the study was conducted in a single medical center. As this was the first study using CAQ on Turkish children, validation study of CAQ should be carried out in a large sample of healthy Turkish children. Finally, a follow-up assessment were not performed to reveal the persistence of symptoms and test, retest reliability for CAQ. However, current findings highlight the importance of pshychiatric evaluation in children and adolescents with NCCP in pediatric clinical practice.

Findings of this preliminary study should be approved with larger samples and physicians should be informed about the psychopathology in NCCP patients. Giving information to the physician will provide appropriate mental health consultation and preclude introducing unnecessary medical tests.

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