Facial emotion recognition in male antisocial personality disorders with or without adult attention deficit hyperactivity disorder

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Abstract

Objective: We aimed to investigate facial emotion recognition abilities in violent individuals with antisocial personality disorder who have comorbid attention deficient hyperactivity disorder (ADHD) or not.
Method: The photos of happy, surprised, fearful, sad, angry, disgust, and neutral facial expressions and Wender Utah Rating Scale have been performed in all groups.
Results: The mean ages were as follows: in antisocial personality disorder with ADHD 22.0 ± 1.59, in pure antisocial individuals 21.90 ± 1.80 and in controls 22.97 ± 2.85 ($p > 0.05$). The mean score in Wender Utah Rating Scale was significantly different between groups ($p < 0.001$). The mean accurate responses to each facial emotion between groups were insignificant ($p > 0.05$) excluding disgust faces which was significantly impaired in ASPD + ADHD and pure ASPD groups. Antisocial individuals with attention deficient and hyperactivity had spent significantly more time to each facial emotion than healthy controls ($p < 0.05$) while pure antisocial individual had more time to recognize disgust and neutral faces than healthy controls ($p < 0.05$).
Conclusion: Study of complex social cognitive abilities in adults with ADHD and violent behaviors is lacking. This study is the first, investigating the differences according to social cognition cues in violent individual that revealed no significance within pure antisocial individuals and antisocial individuals with ADHD.
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1. Introduction

As a continuous process, prospective studies in attention deficit hyperactivity disorder (ADHD) have often reported that it is predictive for severe unwanted outcomes in forensic psychiatry [1]. Significantly higher arrest rates as adults [2], more court referrals in late adolescence [3], and association between ADHD in adults and antisocial behaviors [4] have been reported in the literature.

The processing of facial emotion recognition is essential for normal socialization and personal interaction and antisocial behaviors such as aggression may be consequences of failure to be appropriately guided by the social cues of other peoples [5]. Distress related cues, especially fearful and sad expressions have been shown to play an important role in inhibiting antisocial behavior [5]. Thus, facial emotion recognition seems to have an important place in modulating interpersonal behavior. Alongside inattentiveness, impulsivity and hyperactivity in patients with ADHD, failure in recognition of social cues may be considered as an independent risk factor for interpersonal troubles in ADHD [6]. However, the emotion recognition abilities of adult ASPD with ADHD patients with violent behavior are lacking in the literature. Thus, the current study was designed to investigate facial emotion recognition abilities in violent patients with ASPD + ADHD and violent individuals with

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pure antisocial personality disorder (ASPD). In this study, we have three hypothesis: i) there should be more impairment in identifying facial emotions in ASPD + ADHD than in pure ASPD, ii) patients with a history of violent acts should have more misidentification rates of facial emotions than healthy controls, iii) the required reaction time for recognizing facial emotions should be more impaired in ASPD + ADHD than in pure ASPD and both of them should be more impaired than healthy controls.

2. Methods

2.1. Participants

Fifty-five male offenders from the Council of Forensic Medicine and Kasimpasa Military Hospital in Istanbul who were referred by court decision for psychiatric examination were enrolled in the study. The control group consisted of 39 healthy individuals recruited from the community. The local ethics committee approved the study. Upon giving written informed consent for participating in the study, all participants were asked to complete a computer based Facial Emotion Recognition Test and fill out the Wender Utah Rating Scale. The researchers who were in the computer evaluation phase were blind to the clinical diagnoses of the participants. The antisocial personality disorder and attention deficient hyperactivity disorder diagnoses were made according to the Diagnostic and Statistical Manual of Mental Disorders, Text Revised (DSM-IV-TR) criteria. The criminal history and criminal record were obtained by looking into court files and interviewing individuals with (ASPD). Individuals with ASPD were divided into two groups: antisocial personality disorder (ASPD) with ADHD (n = 34) and pure ASPD (n = 21). The exclusion criteria were i) younger than 18 or older than 65 years old, ii) mentally retarded, iii) visual problems, iii) any chronic medical condition, iv) other axis 1 disorders such as substance dependence, v) current use of psychopharmacologic agents.

2.2. Procedure

For dimensional ADHD measures, the Wender Utah Rating Scale (WURS) was used. WURS [7] is a self-report assessment tool with 61 items, for which adults rate the presence of symptoms of childhood ADHD as 'not at all or very slight, 'mild', 'moderate', 'quite a bit', or 'very much'. Twenty-five of these items are most helpful in separating ADHD subjects from normal controls. A cut-off score of >36 points is 96% sensitive and 96% specific for detecting adult ADHD patients [7]. WURS was translated to Turkish by Oncu et al. [8] and the Turkish form has adequate validity and reliability (Cronbach's alpha 0.88).

2.2.1. Emotion recognition test

This computer-based test included the photos of four male and four female models (a total of 56 mixed photos) with happy, surprised, fearful, sad, angry, disgusted, and neutral facial expressions from Ekman and Friesen's series [9]. These photos were digitized on a computer presentation via an SQL data application in a Visual Basic NET software program developed for presentation on a portable computer (2.4 GHz and 3 MB processor, 3 GB main memory, 15.6 inch LCD screen with 1366 × 768 pixel resolution). At first, the test had a trial section, which was composed of the first seven photos that included each emotional facial expression (i.e., angry, sad, happy, neutral, fearful, disgusted and surprised) that was presented in the same order for each participant. The rest of the 49 photos were used for the data analyses in the study. In these 49 photos, numbers of happy, sad, surprised, fearful, disgusted, angry, and neutral expressions were equal, overall ensuring that participants did not become familiarized to one specific emotional category.

On-screen, participants saw a photo appear, and directly below photos, seven written choices in boxes for that emotion were seen. When a photo appeared on the screen, participants check the box that corresponds to the emotional expression they believe is being shown in the face on the screen. All participants were tested individually in a quiet room. Instructions were given in the same way for the two groups. No feedback was given regarding the appropriateness of any response.

2.3. Data analyses

All statistical analyses were conducted with the Statistical Package for Social Sciences for Windows (SPSS) version 18.0 (SPSS, Chicago, IL). Demographic information was analyzed through descriptive statistics. Variables of gender, marriage status and education were compared by Chi-square test. To test the distribution of the data, the Kolmogorov Smirnov Test was used. For the analyses of abnormally distributed data the comparisons were performed using the Kruskal Wallis and Mann Whitney U tests. In normally distributed data, one way ANOVA was used and Bonferroni correction was made. Correlation analysis was performed by Pearson and Spearman correlation tests. A p value <0.05 was accepted as statistically significant.

3. Results

The mean ages were as follows: in ASPD with ADHD 22.0 ± 1.59, in pure ASPD 21.90 ± 1.80 and in controls 22.97 ± 2.85 and there was no significant difference between groups (F = 2.43 and p = 0.093). There were no significance differences between the three groups according to education level (X2 = 14.92 and p = 0.063), marital status (X2 = 2.39 and p = 0.301) and types of crimes between ASPD + ADHD and pure ASPD (X2 = 0.156 and p = 0.989). The violent acts of the patients are summarized in Table 1.

The mean ADHD score according to the Wender Utah Rating Scale was significantly different within groups (F = 110.29 and p < 0.001). The mean ADHD score in