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Age of Onset of Social Anxiety Disorder in Depressed Outpatients

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Abstract

Onset of social anxiety disorder (SAD) often precedes that of major depressive disorder (MDD) in patients with this comorbidity pattern. The current study examined the association between three SAD onset groups (childhood, adolescent, adulthood) and clinical characteristics of 412 psychiatric outpatients diagnosed with MDD and SAD based on a semi-structured diagnostic interview. Childhood and adolescent SAD onset groups were more likely to report an onset of MDD prior to age 18 and have made at least one prior suicide attempt compared to the adulthood onset group. The childhood SAD onset group also was more likely to have chronic MDD, poorer past social functioning, and an increased hazard of MDD onset compared to the adulthood onset group. Findings suggest that patients with an onset of SAD in childhood or adolescence may be particularly at risk for a more severe and chronic course of depressive illness.

Keywords

social phobia; major depression; comorbidity; severity; impairment

Social Anxiety Disorder (SAD) is the fourth most common psychiatric disorder in the United States (Kessler et al., 2005), and the most common comorbid anxiety disorder in patients with Major Depressive Disorder (MDD; Belzer & Schneier, 2004). Despite high occurrence of SAD with MDD, SAD often goes under-recognized and under-treated in depressed outpatients (Zimmerman & Chelminski, 2003). Patients with SAD rarely seek treatment primarily for it and instead seek treatment for another, more acute disorder such as MDD (Lecrubier, 1998). However, when directly asked, approximately 75% of people diagnosed with SAD desire treatment for it in addition to treatment for MDD (Dalrymple & Zimmerman, 2007).

Several studies have found that age of onset of SAD often precedes age of onset of MDD (Beesdo et al., 2007; Brown, Campbell, Lehman, Grisham, & Mancill, 2001; Dalrymple & Zimmerman, 2007; Kessler, Stang, Wittchen, Stein, & Walters, 1999; Parker et al., 1999), with a typical onset of SAD around mid-adolescence (Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992). However, re-analysis of epidemiological studies has found two peaks of onset of SAD, with some patients reporting an onset before the age of 5 and others

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reporting an onset in mid-adolescence (Juster, Brown, & Heimberg, 1996; Juster & Heimberg, 1995; Stein, Chavira, & Jang, 2001). In contrast, the average age of onset of MDD ranges from 25-35 years of age (Parker et al., 1999; Weissman et al., 1999; Zisook et al., 2007).

Research has shown an association between an early onset of SAD and greater severity, such as the generalized subtype (Wittchen, Stein, & Kessler, 1999). In addition, a childhood onset of SAD has been associated with greater severity of SAD symptoms throughout childhood and adolescence compared to an adolescent or adulthood onset (Dalrymple, Herbert, & Gaudiano, 2007), and those with a childhood onset reported greater severity of SAD after 12 weeks of cognitive behavior therapy compared to those with an adolescent or adulthood onset despite similar pre-treatment scores (Dalrymple, Herbert, & Gaudiano, 2007). For MDD, the following factors have been associated with an early onset: increased familial loading for depression (Klein, Lewinsohn, Seeley, & Rohde, 2001); female gender (Kornstein et al., 2000); higher rates of alcohol use and other substance use disorders (Klein et al., 1999); elevated rates of subsequent depressive episodes in early adulthood (Weissman et al., 1999); more suicidality (Kovacs, Goldston, & Gatsonis, 1993); greater chronicity and disability (Parker, Roy, Hadzi-Pavlovic, Mitchell, & Wilhelm, 2003); higher numbers of medical and psychiatric hospitalizations (Klein et al., 1999); and greater work, family, and social impairment (Rao et al., 1995). An early onset of MDD also is associated with higher rates of anxiety disorders (Biederman, Faraone, Mick, & Lelon, 1995; Parker et al., 2003), particularly SAD and specific phobia (Alpert et al., 1999).

Although prior research has examined an early onset of SAD and MDD separately, few studies have examined the effect of an early versus late onset of comorbid SAD on the severity, course of illness, and functional impairment of MDD. In a prospective, epidemiological study on the subsequent risk of depression in patients with comorbid depression and SAD (Beesdo et al., 2007), the risk of subsequent depression increased by two-fold in individuals with comorbid depression and SAD compared to depression alone. This was most pronounced for individuals who experienced an onset of SAD prior to ages 11 and 16 rather than at later ages, which suggests that the earlier that SAD begins the more likely the individual will experience future depression.

Further research needs to be conducted on onset of SAD and subsequent onset of MDD, given that prior research has found high comorbidity rates between SAD and MDD (Belzer & Schneier, 2004), an age of onset of SAD often preceding that of MDD (Beesdo et al., 2007; Belzer & Schneier, 2004; Brown et al., 2001; Kessler et al., 1999; Parker et al., 1999), and an association between the presence of comorbid SAD and greater severity (Dalrymple & Zimmerman, 2007; Kessler et al., 1994; Schneier et al., 1989; Stein, Fuetsch et al., 2001) and functional impairment of MDD (Alpert et al., 1997; Dalrymple & Zimmerman, 2007; Katzelnick et al., 2001; Lecrubier, 1998; 2001). In particular, patients with an early rather than late onset of SAD may be more likely to develop greater severity of MDD, perhaps making them more resistant to treatment. A previous report from the Rhode Island Methods to Improve Diagnostic Assessment and Services (MIDAS) Project found that the age of onset of MDD was earlier in patients with comorbid MDD and SAD compared to patients with MDD alone, even when controlling for additional comorbidity (Dalrymple & Zimmerman, 2007). The current study is a follow-up to that report and examined differences between a childhood, adolescent, and adulthood onset of SAD in patients with comorbid MDD and SAD, by examining variables related to depression and social anxiety severity, impairment in work and social functioning, and comorbidity. It was hypothesized that an onset of SAD in childhood or adolescence would be associated with greater MDD and SAD severity, impairment in functioning, and comorbidity compared to patients with an onset of SAD in adulthood.

Methods

Participants

Participants were drawn from a larger sample of 3,000 psychiatric outpatients at the Rhode Island Hospital Department of Psychiatry. Of these patients, 412 (13.7%) met current *DSM-IV* criteria for non-psychotic MDD (single episode or recurrent) and SAD. Within this subsample, the majority were female, Caucasian, married or never married, and had a high school degree or equivalency (Table 1). Additional comorbidity was high in this sample, with patients on average having at least two other current Axis I diagnoses in addition to MDD and SAD (Table 3).

Procedure

Individuals presenting for treatment were asked to participate in a diagnostic evaluation prior to meeting with their treating clinician, using the *Structured Clinical Interview for DSM-IV for Axis I Disorders* (SCID; First, Spitzer, Gibbon, & Williams, 1996). Procedures for the study were approved by the institutional review committee at Rhode Island Hospital, and informed consent was obtained before administering the SCID. Diagnosticians were research assistants with bachelor's degrees in social or biological sciences and doctoral-level clinical psychologists. Information regarding the training of diagnosticians has been presented elsewhere (Zimmerman & Mattia, 1999). Forty-eight joint-interview reliability evaluations conducted over the entire course of the project have demonstrated excellent reliability for mood and anxiety disorders (Dalrymple & Zimmerman, 2007).

Measures

Depression severity was rated by diagnosticians using the Clinical Global Impressions Scale (CGI; National Institute of Mental Health, 1985), and overall impairment was rated using the Global Assessment of Functioning Scale (GAF). Interrater reliability for CGI and GAF scores was high (intraclass correlation coefficient [ICC] = 0.79 and 0.80, $ps < 0.001$, respectively). Adolescent and current social functioning and time out of work due to psychopathology were measured using items from the *Schedule for Affective Disorders and Schizophrenia* (SADS; Spitzer & Endicott, 1977). Adolescent and current social functioning were rated by diagnosticians on Likert scales ranging from 1 (superior) to 7 (grossly inadequate). Ratings were collapsed into two categories: fair or worse versus good or better. These items demonstrated good interrater reliability (ICC = 0.74, 0.73 respectively; $ps < 0.001$). Time out of work (in the past 5 years) was rated on a Likert scale ranging from 0 (not expected to work) to 9 (worked none or practically none due to psychopathology). Patients that were not expected to work (e.g., students, those on disability for medical reasons) were excluded from this analysis. Ratings were collapsed into two categories: virtually no time out of work versus up to one month or more out of work. Interrater reliability for this item also was high (ICC = 0.95, $p < 0.001$).

Other variables, such as number and type of current additional Axis I diagnoses, number of past depressive episodes, chronic depression (duration of current episode greater than 2 years), onset of MDD prior to age 18, occurrence of past suicide attempts, occurrence of past inpatient and partial hospitalizations, number of social fears endorsed, and desire of treatment for SAD were obtained from the SCID. Number of social fears was measured by modifying the SCID social phobia module to assess the presence of 13 commonly reported social fears in individuals with SAD: eating in public, writing in public, public speaking, saying something in a group of people, asking a question in a group of people, using public restrooms, business meetings, using the telephone or other job-related equipment, one-on-one conversations with strangers, conversations with sexually attractive others, conversations with authority figures, returning something to a store, and walking around a

mall with no specific plan. These fears were based on the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987), a review of the literature, and clinical experience. Diagnosticians read the list to patients, and they were asked whether they felt fearful, anxious, or nervous in any of those situations. For desire of treatment for SAD, the end of the SAD module of the SCID was modified such that patients meeting criteria for SAD were asked if this was their primary reason for seeking treatment, and if not, whether or not they desired treatment for SAD ("Now that we've talked about it, would you like your future treatment to address this?").

Statistical Analyses

The sample was divided into 3 different groups based on age of onset of SAD: childhood (onset on or before age 12); adolescent (onset from ages 13-17); and adulthood (onset at age 18 or over). Although patients with a childhood or adolescent onset could have been combined into one group, the decision was made to distinguish between a childhood and adolescent onset given the prior research indicating peaks of onset at both of those time points (Dalrymple et al., 2007; Juster et al., 1996; Juster & Heimberg, 1995; Stein, Chavira et al., 2001). The three onset groups were compared on variables described above, using two-tailed chi square tests and analysis of variance (ANOVA) as appropriate. Tukey post hoc tests were conducted for significant ANOVA findings. Due to number of comparisons, the false discovery rate (FDR; Benjamini & Hochberg, 2000) was examined for each comparison to determine to what degree the obtained results were false positive results. The FDR is defined as the expected proportion of false positives amongst the significant tests (Benjamini & Hochberg, 2000). This method of correction is considered to be a compromise between no correction procedure and strict familywise error control, such as the Bonferroni correction (Cribbie, 2007). This method also is more powerful than traditional familywise error correction procedures (Benjamini & Hochberg, 2000). A computer program (Q-Value; Dabney & Storey, 2003) was used to calculate q -values for each comparison, which measures the minimum FDR that is incurred when that test is called significant (Storey, 2002). A test was considered to still be significant if the q -value was less than 0.05 (meaning that we were willing to incur a maximum of 5% false positive rate amongst all of the tests called significant at the $p < 0.05$ level).

Finally, an analysis was conducted between onset groups on time between SAD and MDD onset (in years), using Cox regression. Because we were interested in examining the time to onset of MDD in patients who had developed SAD first, we excluded those individuals who reported an MDD onset prior to SAD or a simultaneous onset of MDD and SAD; therefore, 299 patients were included in this analysis. Cox regression was used rather than a Kaplan-Meier survival analysis in order to include current age as a covariate.

Results

Mean age of onset of MDD was 22.0 years of age ($SD = 12.0$), and mean age of onset of SAD was 11.7 years ($SD = 8.6$). The majority of patients reported an onset of SAD before MDD ($n = 299$; 72.6%). Sixty patients (14.6%) reported an onset of MDD before SAD, and 52 patients (12.6%) reported a simultaneous onset of SAD and MDD (the MDD age of onset was missing for one participant). Two thirds of the patients ($n = 272$) reported an onset of SAD in childhood, while 74 (18.0%) reported an onset in adolescence and 66 (16.0%) in adulthood.

As shown in Table 1, the three onset groups differed on current age with both the childhood and adulthood onset groups being older than the adolescent onset group (childhood versus adolescent $p = 0.04$; adulthood versus adolescent $p = 0.01$). This comparison remained significant when examining the FDR (q -value = 0.03). There was no significant difference

between the childhood and adulthood onset groups on age. There were no other differences between onset groups on demographic variables.

A greater percentage of childhood and adolescent SAD onset patients reported onset of MDD before age 18 compared to the patients with an onset of SAD in adulthood (childhood vs. adulthood onset $\chi^2 = 13.22, p < 0.001$; adolescent vs. adulthood onset $\chi^2 = 6.05, p = 0.01$). This remained significant after examining the FDR (q -value = 0.004). A greater percentage of patients with an onset of SAD in childhood also had chronic MDD compared to patients with an adolescent and adulthood onset of SAD, which remained significant after the FDR correction (q -value = 0.004; childhood vs. adolescent onset $\chi^2 = 11.45, p = 0.001$; childhood vs. adulthood onset $\chi^2 = 5.30, p = 0.02$). In addition, a greater percentage of patients with a childhood and adolescent onset of SAD had made at least one prior suicide attempt compared to the adulthood onset group, which remained significant after the FDR correction (q -value = 0.04; childhood vs. adulthood onset $\chi^2 = 8.33, p = 0.004$; adolescent vs. adulthood onset $\chi^2 = 4.84, p = 0.03$). The initial comparison on CGI scores was significant, but it was no longer significant after the FDR correction (q -value = 0.07). There were no significant differences between groups on occurrence of prior inpatient or partial hospitalizations (Table 2).

A greater percentage of patients with a childhood onset of SAD were rated as having fair or worse social functioning as an adolescent compared to patients with an onset of SAD in either adolescence or adulthood (childhood vs. adolescent onset $\chi^2 = 4.73, p = 0.03$; childhood vs. adulthood onset $\chi^2 = 13.35, p < 0.001$), and this also remained significant after the FDR adjustment (q -value = 0.004). The three groups did not differ on current social functioning or time out of work in the past five years due to psychopathology. Regarding comorbidity, a greater percentage of patients with a SAD onset in adolescence met current criteria for an impulse control disorder compared to patients with a SAD onset in childhood ($\chi^2 = 6.25, p = 0.01$), but this did not remain significant after the FDR correction (q -value = 0.07). There were no differences for other specific Axis I disorders (Table 3).

For the Cox regression analysis (Table 4 and Figure 1), age was entered in the first block and the SAD onset group variable in the second block. The adulthood SAD onset group was the reference category. This overall model was significant ($\chi^2 = 95.71, p < .001$). Results showed that as age increased by one year, the hazard of MDD onset decreased (i.e., there was a longer time to MDD onset). However, being in the childhood SAD onset group increased the hazard of MDD onset relative to the adulthood onset group (i.e., there was a shorter time to MDD onset).

Discussion

The majority of patients with comorbid MDD and SAD in this sample had an age of onset of SAD prior to that of MDD, and these results are consistent with other studies (Brown et al., 2001; Kessler et al., 1999). In general, results from the current study suggested that an onset of SAD in childhood and adolescence was associated with greater severity of MDD compared to patients with a SAD onset in adulthood, in terms of an onset of MDD prior to age 18, chronic MDD, and presence of at least one prior suicide attempt. This is consistent with results from prospective studies (Beesdo et al., 2007) and suggests that the presence of SAD early in life may put an individual at increased risk of experiencing more severe or treatment-resistant forms of depressive illness.

Results from the Cox regression also indicated a shorter time to MDD onset for those with a SAD onset in childhood compared to adulthood. One could argue that these results merely reflect that once one disorder has developed it is likely that a comorbid disorder will develop

later on, and that the earlier the first disorder onsets, the earlier the second one will onset. However, prior research has shown that the onset of SAD tends to precede that of all other disorders (Brown et al., 2001). In terms of social development, children are presented with social interactions from a very young age. Anxiety in social situations and social withdrawal/avoidance tend to start a cycle, such that less exposure to social interactions at a young age interferes with the normal development of social skills, which then reinforces the anxiety and may foster other negative consequences such as lower self-esteem (Messer & Beidel, 1994; Rubin & Burgess, 2001). Social anxiety and withdrawal in childhood also may be accompanied by other symptoms related to depression, such as loneliness, poor concentration, and feelings of hopelessness (Rubin & Burgess, 2001). In fact, prior research has shown that social withdrawal in childhood predicted later depression in adolescence (Rubin, Chen, McDougall, Bowker, & McKinnon, 1995). Therefore, research is converging to show that perhaps there is a specific link between early development of SAD and a later development of MDD.

Timing of SAD onset was not associated with the overall number of additional Axis I current diagnoses, or with the presence of specific disorders. Although initial results suggested a difference on the presence of a current impulse control disorder, it did not remain significant after the FDR correction (with a false positive rate of 7%). However, this variable should continue to be studied in future research, as a recent study from the National Comorbidity Survey-Replication identified a subset of individuals with SAD and an atypical pattern of anger, aggression, moderate to high sexual impulsivity, and substance use problems (Kashdan, McKnight, Richey, & Hofmann, 2009). Other studies also have found high rates of SAD in patients diagnosed with pathological gambling (Zimmerman, Chelminski, & Young, 2006) and male sex offenders with paraphilia or impulse control disorder (Hoyer, Kunst, & Schmidt, 2001).

A childhood onset of SAD in patients with MDD was associated with poorer social functioning as a teenager, but there were no differences between onset groups in terms of current social functioning and number of social fears endorsed. This suggests that despite the timing of the SAD onset the severity of SAD may be comparable at the time of presentation, at least in this treatment-seeking sample.

Results from the current study add further evidence to the existing literature advocating for the early identification and treatment of SAD (Morris, Hirshfeld-Becker, Henin, & Storch, 2004). This is particularly important because SAD has a chronic and unremitting course (Davidson, Hughes, George, & Blazer, 1994), its age of onset often precedes that of other psychiatric problems (Brown et al., 2001), and it appears to result in subsequent onset of mood disorders (Beesdo et al., 2007; Kessler et al., 1999; Stein, Fuetsch et al., 2001). However, prior research has shown that SAD often goes under-recognized in depressed outpatients (Zimmerman & Chelminski, 2003), and this under-recognition therefore may affect patients' ability to receive adequate treatment. In fact, emerging evidence suggests that untreated comorbid SAD may affect the treatment outcome of MDD (DeRubeis et al., 2005; Holma, Holma, Melartin, Rytsala, & Isometsa, 2008), but future research needs to be conducted to further delineate this potential relationship.

Although it may be more difficult to conduct semi-structured diagnostic interviews in routine practice settings, research suggests that clinicians are 15 times more likely to identify the presence of SAD in depressed outpatients when using semi-structured diagnostic interviews compared to unstructured clinical interviews (Zimmerman & Chelminski, 2003). Given that semi-structured diagnostic interviews are lengthy and would prove to be burdensome in many outpatient mental health settings, an alternative is to administer brief self-report screening measures that can help to identify potential problem areas for further

inquiry. Several evidenced-based self-report measures exist that could be used for this purpose, such as the SAD section of the Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman & Mattia, 2001), the Brief Social Phobia Scale (BSPS; Davidson et al., 1991), and the Social Phobia Inventory (SPIN; Connor et al., 2000).

Some limitations should be considered when interpreting results from the current study. Data were collected from a single site and the sample was primarily Caucasian; therefore, results may not be generalizable to other settings or populations. In addition, all patients in this study were seeking treatment. Many individuals seeking treatment tend to over-report psychopathology in general (DuFort, Newman, & Bland, 1993), and therefore the results from the current study may not be generalizable to non-treatment seeking individuals with MDD and SAD. Also because this sample was treatment-seeking, SAD may have been under-represented given that many individuals with SAD do not seek treatment due to the nature of the disorder (Olfson et al., 2000). Therefore, this research should be replicated in epidemiological samples. Furthermore, the number of statistical comparisons may have resulted in an increase in Type I error. However, the FDR correction method was applied (Benjamini & Hochberg, 2000), and results on adolescent social functioning, an onset of MDD before age 18, chronic MDD, and presence of at least one prior suicide attempt incurred a less than 5% FDR. In fact, three of the comparisons (MDD before age 18, chronic MDD, and adolescent social functioning) incurred less than a 1% FDR. Therefore, it is unlikely that these results were false positive results, although these variables should be examined further in future research.

Finally, results obtained from the present study may be a reflection of a reporting bias, given that the ages of onset were retrospectively reported (e.g., they may also have been experiencing depression at the time of SAD onset but do not remember). However, results on reported ages of onset were consistent with other studies, including prospective studies (Beesdo et al., 2007). Nonetheless, further research, particularly prospective studies similar to Beesdo et al., are needed to determine the degree to which SAD onset actually precedes the onset of MDD and therefore serves as a significant risk factor to later developing MDD.

In conclusion, results from the present study indicate that patients with MDD and SAD tend to experience a more severe form of depressive illness when their SAD onset in childhood or adolescence, compared to adulthood. In addition, they experienced a more rapid onset to MDD when their SAD onset in childhood compared to adulthood. Although causal implications cannot be derived from these results given their retrospective nature, they do suggest the need for further research to examine the relationship between an early onset of SAD and subsequent onset of MDD. Results from the present study highlight the importance of the early detection and treatment of SAD, as many patients with SAD tend to experience further psychiatric problems into adulthood.

Research Highlights

- Early onset of social anxiety is associated with greater severity of depression
- Childhood onset of social anxiety is associated with earlier onset of depression
- Early onset of social anxiety is associated with at least one prior suicide attempt

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Figure 1. Hazard Function of Major Depressive Disorder Onset in Patients with a Childhood, Adolescent, and Adulthood Onset of Social Anxiety Disorder

Note. Top line represents the childhood SAD onset group; middle line represents the adolescent SAD onset group; bottom line represents the adult SAD onset group.

Table 1
Demographic Characteristics of Depressed Outpatients with a Childhood, Adolescent, or Adulthood Onset of Comorbid Social Anxiety Disorder

Variable	Total Sample (<i>n</i> = 412)	Child Onset (<i>n</i> = 272)	Adol. Onset (<i>n</i> = 74)	Adult Onset (<i>n</i> = 66)	Statistic	<i>p</i>
<i>Age, M (SD)</i>	<i>38.0 (11.0)</i>	<i>38.3 (11.1)</i>	<i>34.7 (10.8)</i>	<i>40.2 (11.5)</i>	<i>F=4.64</i>	<i>0.01^{a,b}</i>
Gender, <i>n</i> (%)					$\chi^2=0.41$	0.82
Female	280 (68.0)	187 (68.8)	48 (64.9)	45 (68.2)		
Male	132 (32.0)	85 (31.2)	26 (35.1)	21 (31.8)		
Race, <i>n</i> (%)					$\chi^2=6.46$	0.78
Caucasian	346 (84.0)	231 (84.9)	61 (82.4)	54 (81.8)		
African Amer.	27 (6.6)	15 (5.5)	7 (9.5)	5 (7.6)		
Hispanic	15 (3.6)	12 (4.4)	2 (2.7)	1 (1.5)		
Asian	4 (1.0)	3 (1.1)	0 (0)	1 (1.5)		
Portuguese	11 (2.7)	7 (2.6)	2 (2.7)	2 (3.0)		
Other	9 (2.2)	4 (1.5)	2 (2.7)	3 (4.5)		
Marital Status, <i>n</i> (%)					$\chi^2=5.31$	0.87
Married	157 (38.1)	111 (40.8)	24 (32.4)	22 (33.3)		
Living together	31 (7.5)	19 (7.0)	7 (9.5)	5 (7.6)		
Widowed	6 (1.5)	5 (1.8)	0 (0)	1 (1.5)		
Separated	14 (3.4)	10 (3.7)	2 (2.7)	2 (3.0)		
Divorced	67 (16.3)	42 (15.4)	12 (16.2)	13 (19.7)		
Never married	137 (33.3)	85 (31.2)	29 (39.2)	23 (34.8)		
Education, <i>n</i> (%)					$\chi^2=15.25$	0.51
Less than HS	53 (12.9)	39 (14.3)	7 (9.5)	7 (10.6)		
HS/GED	242 (58.7)	155 (57.0)	48 (64.9)	39 (59.1)		
College	98 (23.8)	66 (24.3)	17 (22.9)	15 (22.7)		
Graduate	19 (4.6)	12 (4.4)	2 (2.7)	5 (7.6)		

Note. College = two or four year college degree.

Variables with significant findings are italicized.

b Significant difference on posthoc comparison between childhood and adolescent onset groups.

b Significant difference on posthoc comparison between adolescent and adulthood onset groups.

Table 2
Clinical Characteristics of Childhood, Adolescent, and Adulthood Onset Comorbid Social Anxiety Disorder in Depressed Outpatients

Variable	Child Onset (<i>n</i> = 272)	Adolescent Onset (<i>n</i> = 74)	Adult Onset (<i>n</i> = 66)	Statistic	<i>p</i>
<i>MDD onset before 18, n (%)</i>	124 (45.8)	30 (40.5)	14 (21.2)	$\chi^2=13.23$	0.001 ^{b,c}
<i>Chronic MDD, n (%)</i>	133 (49.1)	20 (27.0)	22 (33.3)	$\chi^2=14.31$	0.001 ^{a,b}
<i>Suicide attempt, n (%)</i>	80 (29.5)	20 (27.0)	8 (12.1)	$\chi^2=8.32$	0.02 ^{b,c}
<i>Past social functioning, n (%)</i>				$\chi^2=15.60$	<0.001 ^{a,b}
<i>Fair or worse</i>	138 (50.7)	27 (36.5)	17 (25.8)		
<i>Good or better</i>	134 (49.3)	47 (63.5)	49 (74.2)		
Additional diagnoses, M (SD)	1.79 (1.40)	2.05 (1.29)	1.76 (1.59)	<i>F</i> =1.14	0.32
Number of episodes ^d , M (SD)	6.85 (16.95)	9.77 (22.99)	5.86 (16.85)	<i>F</i> =0.97	0.38
CGI, M (SD)	3.21 (0.67)	3.01 (0.56)	3.08 (0.51)	<i>F</i> =3.68 ^e	0.04*
GAF, M (SD)	48.40 (7.51)	49.70 (7.25)	49.06 (6.33)	<i>F</i> =1.00	0.37
Number of social fears ^f , M (SD)	5.88 (2.52)	5.52 (2.45)	5.05 (2.58)	<i>F</i> =1.78	0.17
Desire treatment for SAD, n (%)	212 (77.9)	56 (75.7)	57 (86.4)	$\chi^2=2.82$	0.24
Inpatient hospitalization, n (%)	73 (26.8)	24 (32.4)	17 (25.8)	$\chi^2=1.05$	0.59
Partial hospitalization, n (%)	15 (16.1)	6 (24.0)	3 (15.0)	$\chi^2=0.94$	0.62
Current social functioning ^g , n(%)				$\chi^2=2.30$	0.32
Fair or worse	75 (80.6)	18 (72.0)	18 (90.0)		
Good or better	18 (19.4)	7 (28.0)	2 (10.0)		
Time out of work ^h , n (%)				$\chi^2=0.25$	0.88
Virtually none	57 (22.8)	16 (22.9)	13 (20.0)		
One month or more	193 (77.2)	54 (77.1)	52 (80.0)		

Note. Additional diagnoses = number of additional Axis I diagnoses; number of episodes = total number of depressive episodes; CGI = Clinical Global Impression Scale; GAF = Global Assessment of Functioning Scale; SAD = social anxiety disorder; MDD = major depressive disorder; chronic MDD = current episode duration greater than 2 years; suicide attempt = presence of at least one prior suicide attempt; inpatient hospitalization = presence of at least one prior inpatient hospitalization; partial hospitalization = at least one prior partial hospitalization.

Variables with significant findings are bold italicized.

* This comparison was not significant after the false discovery rate correction.

^a Significant difference on posthoc comparisons between childhood and adolescent onset of SAD.

^b Significant difference on posthoc comparisons between childhood and adulthood onset of SAD.

^c Significant difference on posthoc comparisons between adolescent and adulthood onset of SAD.

^d Missing data from one childhood onset participant ($n = 271$).

^e Welch's variance weighted F statistic is reported due to unequal variances.

^f Total sample size reduced to 229 (childhood onset $n = 147$; adolescent onset $n = 42$; adulthood onset $n = 40$).

^g Total sample size reduced to 138 (childhood onset $n = 93$; adolescent onset $n = 25$; adulthood onset $n = 20$).

^h Total sample size reduced to 385 (childhood onset $n = 250$; adolescent onset $n = 70$; adulthood onset $n = 65$).

Table 3
Current Comorbidity of Childhood, Adolescent, and Adulthood Onset Comorbid Social Anxiety Disorder in Depressed Outpatients

Variable	Overall Sample (n = 412) Freq.(%)	Child Onset (n = 272) Freq.(%)	Adolescent Onset (n = 74) Freq.(%)	Adult Onset (n = 66) Freq.(%)	χ^2	p
Alcohol use disorder	39 (9.5)	21 (7.7)	12 (16.2)	6 (9.1)	4.91	0.09
Drug use disorder	21 (5.1)	11 (4.0)	6 (8.1)	4 (6.1)	2.14	0.34
Dysthymia	55 (13.3)	39 (14.3)	11 (14.9)	5 (7.6)	2.28	0.32
Any anxiety disorder	271 (65.8)	179 (65.8)	50 (67.6)	42 (63.6)	0.24	0.89
Any impulse control	66 (16.0)	37 (13.6)	19 (25.7)	10 (15.2)	6.35	0.04 ^a
Any somatoform	55 (13.3)	34 (12.5)	13 (17.6)	8 (12.1)	1.39	0.50
Eating disorder	21 (5.1)	17 (6.2)	2 (2.7)	2 (3.0)	2.21	0.33
ADHD	16 (3.9)	7 (2.6)	6 (8.1)	3 (4.5)	4.87	0.09

Note. ADHD = attention deficit/hyperactivity disorder.

^aThis comparison was no longer significant after the false discovery rate correction.

Table 4
Hazard of Major Depressive Disorder Onset in Patients with a Prior Onset of Social Anxiety Disorder

Variable	B	Wald	p	Exp(B)	95%CI
Age	-0.07	84.04	<.001	0.93	0.92-0.95
SAD onset (overall)	--	10.36	0.006	--	--
Childhood SAD onset*	0.62	8.40	0.004	1.85	1.22-2.81
Adolescent SAD onset*	0.34	1.84	0.18	1.40	0.86-2.28

Note. SAD = social anxiety disorder. Sample size reduced to 299 (childhood onset *n* = 225; adolescent onset *n* = 49; adulthood onset *n* = 25).

Variables with significant findings are bold italicized.

* reference category is adulthood onset of SAD.