Major and Minor Depression in Female Adolescents: Onset, Course, Symptom Presentation, and Demographic Associations

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We examined the epidemiology and phenomenology of major depressive disorder (MDD) and minor depression among a community sample of 496 female adolescents. Diagnostic interviews were conducted annually for 7 years, allowing us to examine onset, course, and symptom presentation among participants 12 through 20 years old. Approximately 1 of 6 girls experienced MDD. MDD episodes had a mean duration of 5.3 months ($SD = 4.2$). One-year prevalence for MDD peaked at age 16 (5.3%). White racial status and younger age were associated with greater worthlessness and suicidality during an MDD episode. One of 5 girls met criteria for minor depression. Adolescents from racial/ethnic minority groups were at especially high risk for minor depression. Adolescence is a high-risk period for depression in young women, although its prevalence and phenomenology vary as a function of age and race/ethnicity. © 2009 Wiley Periodicals, Inc. *J Clin Psychol* 65: 1339–1349, 2009.

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The risk for major depressive disorder (MDD) is pronounced during adolescence (Kessler, Foster, Webster, & House, 1992), with lifetime prevalence rates ranging from 10% to 18.5% (Kessler & Walters, 1998; Lewinsohn & Essau, 2002; Lewinsohn, Hops, Roberts, & Seeley, 1993). Longitudinal studies indicate that the mean MDD onset age is approximately 15 years, with an average episode duration of 6 months (e.g., Lewinsohn, Clarke, Seeley, & Rohde, 1994). Adolescence is a particularly critical period for depression among adolescent girls (Hankin et al., 1998; Wade, Cairney, & Pevalin, 2002). Documenting the occurrence and course of depressive episodes during adolescence informs etiological models of depression onset and maintenance. In addition, understanding MDD symptom presentation and how it varies by age and ethnicity may help refine developmental psychopathology theories by identifying subgroups that are particularly likely to experience certain symptoms. Such information could inform design of depression prevention programs by identifying when to implement an intervention and whom to target. The current study sought to describe the epidemiology and phenomenology of unipolar depression among a large sample of female adolescents who completed annual diagnostic assessments for 7 years.

Compared with the onset and course of MDD, significantly less research has examined its phenomenology. The most prevalent symptoms among adolescents with MDD were depressed mood, sleep disturbance, impaired concentration, and weight/appetite disturbance (Roberts, Lewinsohn, & Seeley, 1995), with no gender differences. Similar work in a Finnish sample of adolescents found that the most frequent symptoms were depressed mood, sleeping difficulties, and impaired concentration (Sihvola et al., 2007). A lack of ethnic diversity precluded an examination of ethnicity/racial differences in these studies.

Documenting the phenomenology of subthreshold depression is important as elevated symptoms are the strongest risk factor for future MDD (Georgiades, Lewinsohn, Monroe, & Seeley, 2006; Lewinsohn & Seeley, 1995; Pine, Cohen, Cohen, & Brook, 1999). Although no consistent definition exists, minor depression typically involves experiencing fewer symptoms than MDD (generally two to four threshold symptoms rather than the five required for MDD; in the present study, we required that participants have five symptoms at subthreshold or full-threshold but not meet criteria for MDD). In the National Comorbidity Survey, lifetime prevalence of minor depression was 8.1% for 15- to 16-year-olds and 14.3% for 17- to 18-year-olds (Kessler & Walters, 1993). Slightly lower rates have been observed among Puerto Rican (Gonzalez-Tejera et al., 2005) and Finnish adolescents (Sihvola et al., 2007). The average length of the longest minor depression in the National Comorbidity Survey was approximately 2.5 months and 69.2% of respondents who experienced an episode of minor depression reported recurrent episodes (Kessler & Walters).

Although past research provides estimates of unipolar depression prevalence and course, much of this research was cross-sectional. Repeated, more frequent, assessments of the same individuals could help to overcome potential biases with recall over long periods of time and allow more accurate model the natural course of disorder over a significant developmental period. The present study is the first to rigorously assess a large sample of adolescents over multiple annual assessments

starting in early and middle adolescence, the period at which MDD is most likely to emerge. It is also important to further document symptom presentation of MDD and minor depression to better understand differences in the presentation of adolescent depression and refine diagnoses in this age period. Finally, additional data are needed to ascertain whether certain symptoms of depression are associated with various demographic factors. This information could be used to better detect depression onset and to design more effective preventative interventions. For these reasons, we examined the phenomenology of unipolar depressive disorders as assessed in the Austin Adolescent Development Study (AADS), which comprised female middle school students who were assessed annually by interview and questionnaire over a 7-year period. Prevalence rates of MDD and minor depression were obtained, and we examined whether demographic factors were associated with episode onset and symptom presentation.

Method

Participants

A total of 496 female adolescents were recruited from public and private middle schools in a metropolitan area of the southwestern United States. Adolescents were in the seventh and eighth grades and ranged in ages from 12 to 15 years at study onset ($M = 13.1$, $SD = 0.7$). The sample was 3% Asian/Pacific Islanders, 5% African Americans, 69% Caucasians, 18% Latina, and 5% "other" or "mixed," which was representative of the sample schools (2% Asian/Pacific Islanders, 8% African Americans, 65% Caucasians, 21% Hispanics, 4% other/mixed). Average parental education was 20% high school graduate or less, 20% some college, 37% college graduate, and 21% graduate degree, which was representative of the metropolitan area (34% high school graduate or less, 25% some college, 26% college graduate, and 15% graduate degree).

Procedure

Active parental consent was used to recruit participants, in which an informed consent letter describing the study and a stamped return envelope were sent to parents of eligible female students (a second mailing was sent 2 weeks later). The participation rate was 56%, similar to other school samples using parental consent (Lewinsohn et al., 1993). Participants completed a questionnaire and diagnostic interview at baseline and six annual follow-ups. Over the course of the project, approximately 25 female assessors with at least a bachelor's degree in psychology conducted all interviews. Assessors participated in 24 hours of training, in which they learned interview skills, reviewed criteria for relevant *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV; American Psychiatric Association, 1994) disorders, observed mock interviews, and role-played interviews. Assessors demonstrated high inter-rater agreement ($\kappa > .80$) with the project coordinator using 12 tape-recorded interviews before collecting data. Assessors, who generally worked for 2–4 years on the study, attended refresher trainings twice a year during data collection. Ten percent of all interviews were recorded throughout the study to ensure acceptable inter-rater agreement ($\kappa > .80$) with other clinical assessors and test-retest reliability. Assessments were conducted on the school campus, at participant's houses, or in our lab. Participants received gift cards or cash payment for participating in each assessment. The University of Texas IRB approved this study.

Measures

Depression. An adapted version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Puig-Antich & Chambers, 1983), a semistructured psychiatric interview, was used to assess MDD as per DSM-IV criteria over the past year at each interview. Four-point severity ratings for each symptom (1 = *absence*, 2 = *subthreshold*, 3 = *threshold*, 4 = *severe*, with behavioral anchors provided) were averaged to form a depressive symptom composite. Items asked participants to report on the peak severity of each symptom during the prior 12 months. Symptoms had to occur simultaneously for a diagnosis of MDD or minor during the past year. Participants who reported the presence of all of the necessary symptoms for MDD simultaneously but endorsed a subthreshold level on at least one symptom were given a diagnosis of minor depression. Participants with MDD could be diagnosed with minor depression at a subsequent assessment, given remission of the prior MDD episode. A total of 37 participants (7.5%) had experienced an episode of MDD prior to study entry; they were included in analyses because our goal was to document rates of MDD during adolescence, rather than rates of first MDD onset. Consistent with other research (e.g., Sihvola et al., 2007), participants were not assessed for bipolar disorder, which has a very low prevalence during this age period (e.g., Lewinsohn, Seeley, & Klein, 2003).

The K-SADS has shown good test-retest reliability ($\kappa = .63$ – 1.00), inter-rater reliability ($\kappa = .73$ – 1.00), and internal consistency ($\alpha = .68$ – $.84$; Lewinsohn et al., 1993). To assess inter-rater reliability in our study, a randomly selected 5% of interviews conducted at each assessment ($n = 149$) were re-interviewed within 3 days by a second assessor blind to the first diagnosis, resulting in high inter-rater agreement for diagnoses ($k = 1.0$) and for the continuous symptom composite ($r = .87$). Another randomly selected subset of participants across assessments ($n = 137$) completed a second diagnostic interview with the same assessor 1 week later, resulting in high test-retest reliability for diagnoses ($k = 1.0$) and for the continuous symptom composite ($r = .86$). The symptom composite showed acceptable internal consistency in the present study ($\alpha = .79$ – $.82$).

Results

Development of Major Depressive Disorder

One-year prevalence rates of MDD from ages 12 to 20 are presented in Figure 1. Annual rates of MDD were lowest at age 12 (0.8%), peaked at age 16 (5.3%), and generally declined in subsequent years. The cumulative rate of MDD (excluding recurrences) during the study period is shown in Figure 2. Probability of MDD steadily increased during adolescence, culminating in 17.6% of participants experiencing at least one episode of MDD during the course of the study.

Among the 88 participants who experienced MDD during the study, 71.0% experienced a single episode. The mean length of MDD was 5.3 months ($N = 87$, range = 1–15, $SD = 4.2$). One participant reported a 63-month MDD episode and was excluded from this analysis because her episode lasted approximately four times longer than any other participant. Among the 26 individuals who experienced two or more episodes of MDD, episodes were separated by an average of 8.6 months (range 1–36, $SD = 8.18$).

Figure 1. Overall rates of MDD and minor depression (1-year point prevalence percents combining new cases and recurrences) and as a function of race/ethnicity across adolescent girls 12 to 20 years old.

Figure 2. Cumulative percentage of adolescent girls ($N = 496$) who developed at least one episode of MDD and minor depression during ages 12 to 20 years.

Development of Minor Depression

One-year prevalence rates of minor depression from ages 12 to 20 are also presented in Figure 1. Annual minor depression rates peaked at age 14 (6.4%) and declined in subsequent years to their lowest point at age 20 (2.6%). The cumulative rate of minor depression (excluding recurrences) is shown in Figure 2. Probability of minor depression onset steadily increased during adolescence, culminating in 22.2% of participants experiencing at least one episode.

Among the 111 participants who experienced minor depression, 91.9% experienced a single episode. Among adolescents with minor depression, 11.7% experienced their first MDD episode in the subsequent year and 30.6% experienced MDD during the remainder of study. Adolescents with minor depression were 5.2 times more likely to experience MDD than adolescents who did not experience minor depression, $OR = 5.15$, $p < .001$, 95% $CI = 3.17, 8.38$.

Associations of MDD and Minor Depression with Demographics

We examined whether MDD occurrence, age of onset, duration, and recurrence were associated with race/ethnicity, and mother's or father's education. There were no

significant differences between ethnic minority groups (Asian, Black, Hispanic, Native American, Other) for MDD onset, $\chi^2(4) = 0.37, p = .98$, or minor depression onset, $\chi^2(4) = 4.03, p = .40$. Thus, although not optimal, we collapsed across racial/ethnicity categories for analyses because of low sample size. None of the demographic variables were associated with any parameters of MDD episode ($ps > .10$). We conducted parallel analyses for minor depression. Race/ethnicity was significantly associated with occurrence of minor depression, $b = 0.48, SE = 0.21, p = .02, OR = 1.62, 95\% CI = 1.07-2.44$; minority adolescents were 1.6 times more likely to report minor depression than White adolescents (28.1% and 19.8%, respectively; Figure 1 presents data for White versus all other race/ethnicity categories). Age of onset was also associated with race/ethnicity ($F[1,109] = 4.28, d = .40, p < .05$); White adolescents tended to be older ($M = 15.51, SD = 1.91$) than minority adolescents ($M = 14.76, SD = 1.88$) at their first minor depression. Paternal and maternal education were both positively associated with age of minor depression onset ($r = .28$ and $.27, p < .05$); less parental education was associated with earlier ages of minor depression onset. Demographic variables were not associated with minor depression recurrence.

Symptom Presentation During MDD and Minor Depression

We next examined the prevalence of individual symptoms during MDD. Figure 3 presents the mean rating for each symptom for female adolescents who experienced

Figure 3. Mean severity of symptoms among participants who experienced MDD ($n = 88$) or minor depression ($n = 111$).

MDD. Symptoms are presented in descending order of severity. For participants who experienced more than one episode, we reported symptom severity for their first episode. Sad mood was the most common and severe symptom. The 95% confidence intervals indicated that sad mood was rated significantly higher than every other MDD symptom. There were only three instances (3.4%) in which an adolescent with MDD did not meet threshold for sad mood, but they met criteria for anhedonia. Symptoms of poor concentration, insomnia, weight difficulties, low energy, and worthlessness were elevated and not significantly different from one another. Symptoms with the lowest ratings were hypersomnia, motor retardation, and motor agitation.

Figure 3 also presents mean symptom ratings for the subset of participants who experienced minor depression. The most prominent symptoms during an episode of minor depression were concentration difficulties, sad mood, insomnia, and low energy. The least prominent symptoms were motor retardation, motor agitation, and anhedonia.

Symptom Presentation, Race/Ethnicity, and Age of Onset

We examined whether White adolescents differed from adolescents from other race/ethnicities in their symptom presentation during MDD. White adolescents with MDD and adolescents from other race/ethnicity categories endorsed similar symptom levels with two exceptions: depressed White adolescents reported more worthlessness and suicidality than other adolescents with MDD; $F(1,86) = 4.12$, $p = .04$ and 6.18 , $p = .02$, respectively. No significant differences emerged for minor depression symptoms as a function of race/ethnicity.

We also examined whether MDD onset age was associated with differential symptom presentation. We formed two groups for these analyses by dividing the risk period in half: adolescents who were younger than 16 at MDD onset and adolescents who were 16 years or older at MDD onset. Girls who experienced MDD at a younger age reported less weight change, more worthlessness, and greater suicidality compared with adolescent girls who were older at first MDD; $F(1,86) = 5.42$, $p = .02$; 13.27 , $p < .001$; and 6.91 , $p = .01$, respectively. Similar analyses were conducted for onset age of minor depression. Younger age of minor depression onset was associated with less sadness, $F(1,109) = 7.24$, $p = .008$; greater change in appetite, $F(1,109) = 5.82$, $p = .002$; less difficulty with weight, $F(1,109) = 4.56$, $p = .04$; greater motor agitation, $F(1,109) = 13.14$, $p < .001$; and greater suicidality $F(1,109) = 7.60$, $p = .007$; during the episode compared with adolescents who first experienced minor depression at an older age.

Discussion

Results from this study provide additional and more detailed evidence that adolescence is a high-risk period for the onset of depressive disorders in young women. This study addresses similar questions to previous reports describing the basic epidemiology of adolescent unipolar depression, but is the first to conduct repeated annual diagnostic assessments of depression in a large sample of adolescents; the relative frequency of assessments increases confidence in the timing of disorder onset and the accuracy of symptom reports. During the ages of 12–20 years, approximately one of every six girls experienced an episode of MDD. Age 16 represented the highest risk period, with 5.3% of adolescents meeting criteria for MDD during that year. Consistent with previous work (Lewinsohn et al., 1995), the

mean duration of MDD episodes was 5.3 months. During an MDD episode, White adolescents were more likely to report worthlessness and suicidality than adolescents from other ethnic/racial backgrounds. Similarly, girls who experienced their MDD episode prior to their 16th birthday were more likely to feel worthless and report suicidality but less likely to report weight change compared with adolescents whose MDD episode occurred after the age of 16.

MDD prevalence data from the present study parallel available previous research, which increases confidence in our understanding of the nature of this disorder. The 1-year period prevalence rates of MDD observed in the current study are consistent with findings from longitudinal studies from New Zealand (Hankin et al., 1998), Britain (Ford, Goodman, & Metzler, 2003), and Canada (Wade et al., 2002). The timing of MDD onset is remarkably consistent across studies, which is striking given that samples were from different countries. In the current study, 1-year period prevalence MDD rates increased from ages 12–16 years, peaked at age 16, and then declined in subsequent years.

We also examined the prevalence of each MDD symptom, which has been done much less frequently than the incidence and prevalence of disorders. We found that sad mood was the most prominent and severe symptom, at a rate significantly higher than all other symptoms. Interestingly, anhedonia was not a highly prevalent symptom in this sample. Further, less than 4% who experienced MDD met criteria for anhedonia in the absence of sadness. This suggests that anhedonia may not be a critical symptom for diagnosing MDD in female adolescents or may be an unusual experience. Other prominent symptoms during MDD included cognitive symptoms (poor concentration and worthlessness) and somatic features (insomnia, weight, low energy). The symptoms with the lowest ratings were hypersomnia, motor retardation, and motor agitation. Our data also indicate that there are important age and race/ethnicity differences in how adolescents experience MDD, which, to our knowledge, have not been reported previously in this degree of detail. Younger adolescents with MDD reported greater worthlessness and suicidality than older adolescents. Further, White female adolescents were more likely to report significantly more worthlessness and suicidality than adolescents from other racial/ethnic backgrounds. Given this pattern of findings, preventing the escalation of suicidal ideation to suicide attempts, particularly among younger and White female adolescents, will be a particularly important challenge.

The present study presents important new data on the epidemiology and phenomenology of minor depression in female adolescents. One-year period prevalence rates for minor depression ranged from 2.6% to 6.4% and almost one of five girls experienced minor depression during the study. This is consistent with limited epidemiological work, although our 1-year prevalence rates are slightly lower than previous epidemiological studies (Kessler & Walters, 1998). This may have been due to variations in the definition of minor depression across studies, location of study participants (i.e., national sample vs. Austin, Texas), instruments used to assess depression (CISD vs. K-SADS), or a number of other factors. Nevertheless, these studies document that minor depression is prevalent among adolescent girls. Regarding symptom presentation during minor depression, rates of severity were lower than when MDD was present, with three exceptions: 95% confidence intervals between MDD and minor depression overlapped for guilt, hypersomnia, and motor agitation, suggesting no significant differences in the severity of these symptoms during episodes of MDD and minor depression. Sad mood appeared to be particularly pronounced during MDD compared with minor depression.

Rates of minor depression peaked at age 14, which was 2 years before the peak for MDD. However, this finding may be driven by ethnic/racial minority adolescents who experienced high rates of minor depression at an early age. This finding is the first of its kind and needs to be replicated, but it suggests that minority female adolescents are at very high risk for minor depression in early adolescence. Determining why rates of minor depression are so high for this demographic group and examining whether the effects are specific to certain minority groups will be important foci for future research. This would be consistent with previous work that found higher depressive symptom and disorder distress in Latino youth compared with their White counterparts (U.S. Department of Health and Human Services, 2001), as well as reports that Latino youth in the United States endorse higher rates of both depressive symptomatology and suicidal ideation than their peers residing in Mexico (Centers for Disease Control and Prevention, 1998). In the present study, Latinas were the largest ethnic minority group, constituting 57% of the ethnic/racial minority sample.

This difference in minor depression onset as a function of race/ethnicity is particularly striking, given that no race/ethnicity differences were observed for MDD onset, duration, or recurrence. It may be that experiencing minor depression between ages 13–14 years places these individuals at risk for MDD at a point beyond the timeframe of this study, perhaps during adulthood (Pine et al., 1999). Conversely, ethnic minority adolescents may be more resilient to subsequently experiencing MDD. This interpretation is consistent with findings indicating that ethnic minority adults often report lower rates of MDD than White adults (Kessler et al., 2003). Another possibility is that minority adolescents may be more likely to follow a trajectory of heterotypic continuity, transitioning from minor depression into an externalizing or substance use disorder, rather than homotypic continuity, escalating into MDD. If ethnic minority adolescents with subthreshold depression are indeed more resilient to MDD, understanding factors that reduce their risk for MDD may provide important insights for the prevention of MDD in general. More research with these populations is clearly needed.

This study has several limitations that should be noted. First, our sample solely comprised adolescent girls. Although MDD occurs more frequently in adolescent girls than it does in adolescent boys, it still is among the most common disorders experienced by male adolescents. Second, although we had a more ethnically diverse sample than much of the previous research, the absolute numbers of participants from racial/ethnic minority groups was still low. We, thus, formed two groups: White and other racial/ethnic minorities. Although clearly not optimal, this approach provided the most statistical power while simultaneously allowing us an opportunity to begin examining important questions related to race/ethnicity. Nonetheless, this decision provided no information on potentially significant differences between minority groups (e.g., rates of minor depression occurrence varied from 25% among Asian Americans to 75% among Native Americans, but those groups comprised only eight and four participants, respectively) and the “other” category comprises a mixture of minority groups unique to this region of the country; future research with samples comprised of a single race or ethnic minority group should be conducted. Third, we do not have data on dysthymia or other mood disorders (e.g., adjustment disorder with depressed mood). A fourth limitation is that we relied on adolescents self-report, although adolescents are generally the optimal source of information on depression (Cantwell, Lewinsohn, Rohde, & Seeley, 1997).

In conclusion, the present study corroborates previous research indicating that adolescence is a high-risk period for both major and minor depression in young

women. However, the report also provides new data that suggest that the prevalence and phenomenology of unipolar depression vary as a function of age and race/ethnicity in ways that have important implications for both the treatment and the prevention of this common and debilitating category of psychopathology.

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