Outcomes in Women Diagnosed With Borderline Personality Disorder in Adolescence

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Abstract

Objective: This study examined the outcomes of patients diagnosed with borderline personality disorder (BPD) prior to age 18. **Method:** In a group of 47 adolescent girls assessed over a 10 year period, 31 had a past diagnosis of BPD while 16 had not met criteria. Subjects were assessed with the SCID-I, the Diagnostic Interview for Borderlines (DIB), the SCL-90-R, the Social Adjustment Scale (SAS-SR), the Affective Lability Scale (ALS), the Barratt Impulsivity Scale (BIS), the Continuous Performance Test (CPT), the Wisconsin Card Sorting Test (WCST), and the Attention Network Task (ANT). **Results:** 4.3 years after initial presentation (mean age=19.6), only 11 index patients still met criteria for BPD and no new cases developed. Those who did not remit were significantly more likely to have a current episode of major depressive disorder, lifetime substance use disorder, and self-reported childhood sexual abuse. Those who still met BPD criteria also scored higher on the ALS and the total severity scale as well as several subscales of the SCL-90, but not on other measures. **Conclusions:** These findings support the validity of an adolescent diagnosis of BPD and show that the majority of cases that develop in early adolescence can be expected to remit within 4 years.

Key words: borderline personality disorder, adolescent, longitudinal course

Résumé

Objectif: Examiner les résultats de l'étude sur des patientes qui ont reçu un diagnostic de trouble de personnalité borderline (TPB) avant l'âge de 18 ans. **Méthodologie:** Quarante-sept adolescentes ont été évaluées sur dix ans; trente-et-une d'entre elles avaient reçu un diagnostique de TPB tandis que 16 ne répondaient pas aux critères de ce trouble. Les adolescentes ont été évaluées au moyen des outils suivants: SCID-I, Diagnostic Interview for Borderlines (DIB), SCL-90-R, Social Adjustment Scale (SAS-SR), Affective Lability Scale (ALS), Barratt Impulsivity Scale (BIS), Continuous Performance Test (CPT), Wisconsin Card Sorting Test (WCST) et Attention Network Task (ANT). **Résultats:** 4,3 ans après leur évaluation initiale (âge moyen = 19,6 ans), seulement 11 adolescentes satisfaisaient aux critères de TPB; il n'y avait eu aucun nouveau cas. Les adolescentes dont les symptômes ne s'étaient pas atténués risquaient beaucoup plus que les autres de souffrir de dépression majeure, d'abuser de substance tout au long de leur vie ou d'avoir été agressées sexuellement dans l'enfance. Le score des adolescentes qui satisfaisaient aux critères de TPB était plus élevé uniquement à l'échelle ALS, à l'échelle de sévérité globale et à diverses sous-échelles du SCL-90. **Conclusions:** Ces résultats confirment la validité du diagnostic de TPB et montrent que la majorité des sujets diagnostiqués en début d'adolescence peuvent voir leurs symptômes s'atténuer dans les quatre années qui suivent.

Mots clés: trouble de personnalité borderline, adolescente, étude longitudinale

Borderline personality disorder (BPD) is a mental disorder frequently encountered in emergency rooms, psychiatric outpatient clinics, and inpatient wards (Zimmerman, Rothschild, & Chelminski, 2005). Symptoms usually begin in adolescence and some evidence suggests that BPD can be reli- ably diagnosed in this age group (Chanen, Jackson, McGorry, Allot, Clarkson, & Yuen, 2004; Miller, Muehlenkamp, & Jacobson, 2007), even though treatment typically begins in early adulthood (Zanarini, Frankenburg, Khera, & Bleichmar, 2001).

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The course of BPD in adolescent patients is not well understood. Existing studies suggest that the diagnosis is not always stable over the course of development. A prospective study of a clinical population between the ages of 15 and 18 (Chanen et al., 2004) found that only 40% of BPD cases met criteria at two year follow-up. A community study of self-reported symptoms in adolescent twins also found a decrease in rates of diagnosis from 14 to 24 years of age, with significant reductions in symptoms at each 2–3 year interval during the 10 year follow-up (Bornovalova, Hicks, Iacono, & McGue, 2009). A two-year follow-up of adolescent inpatients also found instability of diagnosis, with an over 50% reduction in the number of cases at follow-up (Mattanah, Becker, Levy, Edell, & McGlashan, 1995). However, a longitudinal community study of adolescents with 2 and 8 year follow-up (Bernstein et al., 1993; Crawford, Cohen, & Brook, 2001) found that BPD symptoms tended to persist even when formal diagnostic criteria were no longer met.

It is well established that the outcome for adults with BPD is usually positive, as symptoms "burn out" with increasing age (Paris & Zweig-Frank, 2001). But while symptoms improve, functional levels change much more slowly (Skodol et al., 2005). Prospective studies have shown that the majority of adult BPD patients remit, often within the first four years of follow up (Skodol et al., 2005; Zanarini, Frankenberg, Hennen, Reich, & Silk, 2006a). These results are similar to the limited data of adolescents diagnosed with BPD.

Little is known about factors that might predict outcome in adolescents with BPD. The adult literature suggests a number of factors that adversely affect outcome, including childhood sexual abuse and substance abuse (Paris, Zweig-Frank, & Guzder, 1993; Stone, 1990; Westen, Ludolph, Misle, Ruffins, & Block, 1990; Zanarini et al., 2006b). Another predictor is personality trait profiles; in a prospective study by Zanarini et al. (2006a), low neuroticism and high agreeableness were associated with a better outcome, while in a retrospective study (McGlashan, 1986), lower levels of affective lability were associated with better outcome. There have not been any reports of whether biological markers, such as measures of neuropsychological functioning, may affect outcome.

The neuropsychological profiles of adolescents with BPD have not been described in the literature, but a number of studies in adults have shown impairment in specific cognitive domains. One of the most common and robust findings has been deficits in executive functioning (EF), suggesting decreased frontal processing (LeGris & van Reekum, 2006; Posner et al., 2002; Ruocco, 2005). Deficits in EF would be expected to lead to more impulsive and less planned behaviour, which could include substance abuse, impulsive aggression, and fluctuations in emotional responses. It is difficult to compare the results of these studies because each has used different measures; moreover, they have compared adults with BPD to the general population, so it is unclear whether deficits in EF are specific to the disorder.

The objectives of this study were to explore the longer-term outcomes of women who were diagnosed with BPD in adolescence, in terms of current diagnoses and functional status. The study also examined factors that might be associated with these outcomes, including the traits of impulsivity and affective lability as well as neuropsychological measures of executive functioning and attention. BPD patients were compared with women diagnosed with other psychiatric disorders in adolescence.

Methods

Participants

This sample included all patients who had been referred to a treatment program for adolescent girls with BPD at a psychiatric hospital in Montreal, Quebec. This highly specialized program recruits patients clinically diagnosed with BPD from a very large catchment area. This led to some challenges locating these patients who were now dispersed over a wide region and would frequently move for school or family reasons. There were a total of 49 potential participants in the clinic from 2004 to 2006, 31 of whom agreed to participate in this study. A comparison sample was drawn from 48 patients who were assessed by the same clinic during the same time period and had disruptive behaviour disorders but did not meet criteria for a diagnosis of BPD. Of these, 16 agreed to participate. There were no other exclusion criteria. No further information was available on those who did not participate. Although epidemiological studies have not found gender differences in the prevalence of BPD (Lenzenweger, Clarkin, Fertuck, & Kernberg, 2004), the majority of clinical cases of BPD are female (Gunderson & Links, 2008). Thus, since it is not known whether gender affects course, the present investigation was limited to females. Participants, as well as the parents of minors, signed consent forms and were compensated for participating. The study was approved by the McGill University Institutional Review Board.

The sample was divided into three groups: those who never had a diagnosis of BPD, those who had a diagnosis in the past and remitted, and those who retained a diagnosis of BPD. Characteristics of the three groups are presented in Table 1. At follow up, there were no new cases of BPD among participants in the comparison group. There is a significant difference in ages between the groups (F=4.632, p<0.05) and post-hoc analyses revealed that the never BPD group was significantly older than the group with a persistent diagnosis of

BPD. There was also a significant difference in the proportion of participants currently in treatment.

Measures

All potential participants had past diagnoses of BPD established by the Retrospective Diagnostic Interview for Borderlines (R-DIB; Armelius, Kullgren, & Renberg, 1985), which is a chart review adaptation of the Diagnostic Interview for Borderlines (Gunderson & Kolb, 1978) that strongly correlates with scores on the original measure. An investigator (JP) with extensive experience using this instrument carried out all the scoring, with one additional evaluation conducted by a second investigator (RB; trained by JP). To establish inter-rater reliability on this instrument, both investigators independently evaluated the charts of 10 patients who were not participants of the study, with a kappa of 1.0. These baseline evaluations were conducted when the participants were a mean of 15.1 years of age, an average of 4.4 years prior to the current assessment.

The follow-up assessment was conducted by RB, and included demographic data, a self-reported history of physical and sexual abuse, assessment of mood and substance use disorders, as well as a diagnosis of BPD. RB administered the Diagnostic Interview for Borderlines – Revised (DIB-R; Zanarini, Gunderson, & Frankenburg, 1989), and the SCID-I (Spitzer & Williams, 1985) modules, with training by JP, who has previously established reliability (Paris, Zweig-Frank, & Guzder, 1994). JP and RB viewed recordings of interviews of 10 patients not in this study, with a kappa of 1.0.

Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1977). The SCL-90-R is a frequently used measure of recent psychopathological symptoms. It is a 90-item scale that includes 9 subscales and summary scores with high internal consistency and test-retest reliability.

Social Adjustment Scale Self-Report (SAS-SR; Weissman & Bothwell, 1976). The SAS-SR is a widely used 54-item scale that measures role performance over the previous two weeks. There is a global scale and seven subscales for different domains of social functioning. The SAS-SR has been shown to have good test-retest reliability and its validity has been supported by robust intercorrelations among ratings by subjects, informants, and interviewers.

Affective Lability Scales (ALS). The Affective Lability Scales (ALS; Harvey, Greenberg, & Serper, 1989) is a 54-item self-report measure designed to assess patterns of mood fluctuation. Subscale scores for six dimensions of affective instability are yielded: labile anger, labile depression, labile elation, labile anxiety, depression/elation oscillation, and depression/anxiety oscillation. The internal consistency of the ALS subscales has been demonstrated and one-month test-retest reliability values for the subscales are also acceptable (Harvey et al., 1989). Recent research (Koenigsberg et al., 2002) has validated the ALS for use with patients with personality disorders, finding that the ALS clearly differentiated BPD from other Axis II disorders, while affective intensity did not.

Barratt Impulsivity Scale (BIS; Barratt, 1985). The BIS is a 34-item self-report measure with sub-scales for motor, cognitive and non-planning impulsivity. The scale has good internal consistency and reliability, and has been validated by its relationship to behavioural measures of impulsivity. The BIS has been widely used as a trait measure of impulsive behaviour in neurobiological studies.

Wisconsin Card Sorting Task (WCST; Heaton, 1981). The WCST is a well-known measure of the cognitive flexibility components of EF, including planning and set shifting. Participants are required sort cards depicting coloured geometric shapes according to color, form, and number. They receive no instruction on how to sort the cards, but receive feedback whether the card they just sorted was correct or incorrect, with sorting methods changing without warning during the test. A computerized version of the WCST was used.

Continuous Performance Test (CPT-II; Conners, 2000). The CPT is a well known and frequently used computerized measure of attention and response inhibition. In this test, letters appear on the screen and participants are required to respond only when they see one specific letter, allowing assessment of their ability to maintain focus and also inhibit responses when the specified letter is not presented.

Attention Network Test (ANT; Fan, McCandliss, Sommer, Raz, & Posner, 2002). The ANT is a computerized test designed to help examine the three different networks of the attention system, alerting; orienting, and executive control, as conceived of by Posner and Peterson (1990) and has been used in numerous studies of attention (Posner et al., 2002). The ANT is a combination of the cued reaction time and flanker tasks, requiring the subject to determine whether an arrow presented on a screen is pointing left or right. Results allow for independent scores for the three attentional networks.

Data Analysis

Continuous variables were analysed using one way ANOVAs with Tukey tests to determine the group differences and Chi-square tests were conducted for dichotomous variables. Bonferonni corrections for multiple comparisons were used. Pearson correlations were performed between neuropsychological measures of EF and psychological trait measures. All calculations were conducted using SPSS version 14.0 (SPSS Inc., Chicago, IL, USA).

Table 1. Sample demographics			
	Never BPD (N = 16)	BPD Remitters (N = 20)	Persistent BPD (N = 11)
Age*	20.38 (1.46)	19.55 (1.73)	18.36 (1.91)
Number of school years completed	10.63 (1.78)	10.15 (1.73)	10.45 (2.25)
Number currently employed	63% (10)	45% (9)	36% (4)
Number currently in treatment**	19% (3)	25% (5)	73% (8)
*$p < 0.05$; **$p < 0.01$			

Results

Outcomes of a Past BPD Diagnosis. Thirty-one participants met retrospective DIB criteria for a diagnosis of BPD in adolescence (at a mean age of 14.9) and 16 participants did not meet criteria (at a mean age of 15.6). Of the 31 women who were diagnosed with BPD as adolescents, 20 (65%) remitted and only 11 (35%) retained the diagnosis at follow-up. Of the 16 not diagnosed with BPD in adolescence, no new cases of BPD emerged.

On the SCID-1, rates of comorbid diagnoses of current major depressive disorder (χ^2=6.836, df.=2, p<0.05), current dysthymia (χ^2=6.209, df.=2, p<0.05), lifetime alcohol use disorder (χ^2=12.852, df.=2, p<0.005), and lifetime substance use disorder (χ^2=16.531, df.=2, p<0.001) were significantly different between the three groups. Post-hoc Chi-square tests indicated that lifetime alcohol use disorder (χ^2=10.543, df.=1, p<0.005) and drug use disorder (χ^2=13.828, df.=1, p<0.001) were significantly less frequent in those who were never BPD. Lifetime substance use disorder (χ^2=8.914, df.=1, p<0.005) was more frequent in those who have persistent BPD.

When symptoms were assessed by self-report, the BPD group also displayed greater overall severity (F=6.865, p<0.005) with particular differences in the interpersonal (F=4.391, p<0.05), depression (F=3.535, p<0.05), hostility (F=10.382, p<0.001), paranoid ideation (F=7.897, p=0.001), and psychoticism (F=3.977, p<0.05) subscales of the SCL-90-R. Post-hoc comparisons revealed that those with persistent BPD scored significantly higher on the interpersonal, hostility, paranoid ideation, and psychoticism subscales than the other groups.

Women with persistent BPD were significantly more likely to have experienced childhood sexual abuse (χ^2=10.556, df.=2, p=0.005). There was no difference between the groups on self-reports of physical abuse, or rates of youth protection involvement. Post-hoc Chi-square tests indicated that those who were never BPD were significantly less likely to have experienced childhood sexual abuse compared to those who were BPD in the past (χ^2=7.670, df.=1, p<0.01) and those who have persistent BPD are significantly more likely than those who are not currently BPD to have experienced childhood sexual abuse (χ^2=7.070, df.=1, p<0.01).

The groups did not differ in terms of functional status, as measured by the SAS-SR.

Trait Measures
There were significant differences between the groups on the scales of the ALS, including labile depression (F=4.682, p<0.05), labile anger (F=5.650, p<0.01), and total scores (F=4.181, p<0.05). Those with persistent BPD had significantly higher scores on the anger scale than both other groups and higher depression and total scores than the remitters.

There were no differences between the groups in impulsivity, as measured by the BIS.

Neuropsychological Measures
There were significant differences between the groups on a vigilance measure of the CPT, the hit standard error block change (F=5.083, p<0.05), as well as on the total score of the CPT (F=3.663, p<0.05), with the group of remitters having a higher score than the other two groups.

There were no differences between the groups on the WCST or the ANT. There were no associations between the BIS scores and any of the neuropsychological measures.

Discussion
The current study sheds light on outcomes of adolescents diagnosed with BPD. Nearly two thirds of these patients no longer met criteria at four-year follow-up. There were no new cases of BPD in those not diagnosed in the past. These findings are generally consistent with a previous prospective follow-up (Chanen et al., 2004) who also found a 60% remission rate, although they did note the development of a number of new cases. Chanen et al. (2004) suggested that there was moderate stability for the BPD diagnosis, but that those who recover tend to be at high risk for developing other

Table 2. Comparison of BPD group and the clinical comparison group			
	Never BPD (n=16)	BPD remitters (n=20)	BPD (n=11)
Rate of physical abuse	38% (6)	60% (12)	55% (6)
Rate of sexual abuse**	19% (3)	50% (10)	82% (9)
Proportion with history of youth protection involvement	63% (10)	65% (13)	92% (10)
Proportion with current MDD*	0% (0)	0% (0)	19% (2)
Proportion with current dysthymia*	19% (3)	0% (0)	0% (0)
Proportion with current alcohol use disorder	0% (0)	15% (3)	0% (0)
Proportion with current substance use disorder	6% (1)	30% (6)	18% (2)
Proportion with lifetime MDD	50% (8)	65% (13)	82% (9)
Proportion with lifetime alcohol use disorder**	6% (1)	45% (9)	73% (8)
Proportion with lifetime substance use disorder***	25% (4)	70% (14)	100% (11)
* $p < 0.05$; ** $p < 0.005$; ***$p < 0.001$			

personality disorders, as has been found in a community study (Bernstein et al., 1993). In the current study, the presence of other personality disorders was not assessed.

The rate of recovery in this sample parallels that seen over a similar time period in adults with BPD (Zanarini et al., 2006). It is now well established that personality disorders are not lifelong conditions and that most patients can be expected to improve as they mature (Shea et al., 2009). For this reason, the relative lack of stability of BPD between adolescence and young adulthood should not be interpreted as suggesting that the diagnosis is invalid, rather BPD should be considered a diagnosis that adult patients can expect to remit from, but 30% of remitters will likely experience a relapse (Zanarini, Frankenberg, Bradford Reich, & Fitzmaurice, 2010a). Our finding that those with persistent BPD are younger supports the hypothesis that increasing age leads to decreasing symptoms. Although patients with BPD may experience sufficient improvement to no longer qualify for the diagnosis, follow-up studies in adults with BPD indicate that good psychosocial functioning is only attained in 60% of BPD patients over a 10 year follow-up period and that vocational impairment is more frequently seen than social impairment (Zanarini, Frankenberg, Bradford Reich, & Fitzmaurice, 2010b). These findings highlight the need to direct BPD patients to specialized treatments at an early age when there is more potential to provide them the skills necessary for improved long-term functioning, particularly in the educational and vocational domains. Several psychotherapies have been demonstrated to lead to improvements in functioning in BPD patients (Linehan, Heard, & Armstrong, 1993; Giesen-Bloo et al., 2006; Bateman & Fonagy, 2008; Bateman & Fonagy, 2009; Doering et al., 2010), but the diagnosis of

BPD needs to be made before these treatments should be offered as these therapies have not been validated in other disorders. In those who do meet criteria for BPD, a clear diagnosis is vital as it can prompt psychoeducation about the disorder that could include directing the patient for appropriate evidence-based treatment, despite the stigma attached to BPD amongst physicians and mental health professionals (Aviram, Brodsky, & Stanley, 2006).

The absence of any new onsets of BPD in young adulthood is consistent with findings of Zanarini et al. (2001) drawn from self-report. It is not clear what the antecedents of BPD are earlier in development. Although some children with pathology resembling BPD prior to puberty have been studied, they do not usually go on to BPD in adolescence (Zelkowitz, Guzder, Paris, Feldman, & Roy, 2007). Our observation that the group of women never diagnosed with BPD is the oldest suggests that women with BPD may seek treatment at an earlier age than women with other disruptive behaviour problems. If most cases of BPD begin around puberty, that would be consistent with the most common age of onset for self-harm (Zanarini et al., 2006b), substance use (Grant & Dawson, 1998), suicide attempts (Lewinsohn, Rhode, & Seeley, 1996), and other impulsive behaviours.

A history of sexual abuse was reported significantly more frequently, both in those who currently have BPD and those who have remitted from BPD compared to those who have never had BPD. These results could suggest that sexual abuse is a risk factor for both the development and maintenance of BPD, consistent with a number of findings that indicate that abuse is both a risk factor for the development of BPD, as well as a risk for a more severe course (Zanarini et al., 2006b). However, not all patients with BPD reported sexual abuse and

not all participants who experienced sexual abuse went on to develop BPD, consistent with previous research (Paris et al., 1994). A history of alcohol and substance use disorder was also significantly more common in those who are currently diagnosed with or have previously been diagnosed with BPD, which is similar to findings in adults (Stone, 1990).

As for personality traits, affective lability as measured by the ALS was higher in those who currently have a diagnosis of BPD as compared to those who do not currently have a diagnosis of BPD. This is consistent with the hypothesis that emotional dysregulation is a core component of BPD (Linehan, 1993), and with the finding that this aspect of BPD is the least likely to change with time (Paris & Zweig-Frank, 2001). It is possible that those who have lower levels of affective lability may be more likely to remit as they may represent a less severely ill group. This is particularly true if affective instability is a core feature of the BPD diagnosis (Siever & Davis, 1991). On the other hand, the BPD group did not report higher levels of impulsivity, possibly because the comparison groups were similarly impaired. It may be that only a combination of emotional dysregulation and impulsivity leads to a full presentation of BPD, as has been previously hypothesized (Crowell, Beauchaine, & Linehan, 2009).

The neuropsychological findings of this study demonstrated deficits in vigilance as well as an overall impairment in the total measure of attention on the CPT among the BPD remitters group. There were no significant findings on either the WCST or ANT, including the component of the ANT that is similar to the vigilance measure on the CPT. It should be noted, however that neuropsychological findings in adults with BPD have generally been inconsistent (Lenzenweger et al., 2004; Ruocco, 2005), although deficits in sustained attention have been noted in some studies. In this sample, the differences in neuropsychological performance may have been masked by the use of a similarly impaired control group.

There are several limitations to this study. The first is the use of a sample of BPD patients who received treatment with an adaptation of dialectical behaviour therapy (Linehan, 1993). Improvements may be due simply to the passage of time, treatment effects, or a combination of the two. Since there was a significantly greater proportion of BPD persisters currently engaged in some form of psychotherapy, it is possible that this group may not have had as much treatment as the other groups, which is also consistent with their younger age. The second limitation was small sample size, resulting in limited power to test for group differences. A third limitation is loss to follow-up; those who participated may have constituted a less severely ill sample based on their willingness to participate in research. Interpersonal difficulties are one of the hallmarks of patients with BPD (Gunderson & Links, 2008) and in those who are severely ill, this may preclude

participation in research. Nonetheless, the results were consistent with a previous follow-up study (Chanen et al., 2004). A fourth limitation is the choice of neuropsychological measures, which may have been too narrow to pick up the deficits that may be characteristic of BPD. Finally, our measure of sexual abuse did not use standard instruments. Despite these limitations, this is the first study that has systematically examined the outcomes of adolescent girls diagnosed with BPD and factors associated with remission.

In summary, the results of the study indicate that BPD can develop in early adolescence, and that the majority of cases can be expected to remit within four years. A history of sexual abuse, alcohol, and substance use disorders is associated with failure to remit, and affective lability is also associated with continuation of BPD. Ultimately, clinicians need not be reluctant to diagnose BPD in adolescent patients on the grounds of a negative prognosis. Early diagnosis might lead to timely identification of BPD and access to treatment.

Acknowledgments / Conflicts of Interest

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