Personality and bipolar disorder: Do personality factors play a role in an earlier onset of bipolar disorder?

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Abstract

Little is yet known about the causes and risk factors of bipolar disorder. Previous research has shown that bipolar disorder patients have different personality trait profiles than healthy individuals. This quantitative study aimed to gain more knowledge about the differences between patients with an early age at onset or a later age at onset. The participants were asked to fill in the NEO-five factor inventory (NEO-ffi) and the severity indices of personality problems -short form (SIPP-sf) to measure five domains of personality traits and five domains of personality functioning. The data of these domains were placed in separate regression models against the age at which bipolar disorder developed. The data from these models showed only a significant Beta value for neuroticism even after correcting for the current mood. This result suggests that there is an association between neuroticism and developing bipolar disorder earlier on in life. No other significant associations were found in this study. The importance of this study is that future research can be done to work on screening programs for these type of risk factors so future cases of bipolar disorder might be prevented.

Introduction

Extreme moments of euphoria, feeling unstoppable, or perhaps even feel like God itself. These are all possible feelings when in a state of mania (Carvalho et al., 2020). When these episodes are interchanged with episodes of depression we speak of a bipolar disorder (Grande et al., 2016).

Approximately 2% of the world population suffers from a type of bipolar disorder (Passos et al., 2016). This disorder often leads to both severe suffering for the patients, as well as to economic and societal costs. Since bipolar disorder onsets for the majority of the patients in young adulthood this affects the working population and is therefore economically damaging (Grande et al., 2016). With a suicide risk of almost 8% in men and 5% in women, it is clear how much suffering is caused by this disease (Passos et al., 2016).

Despite increasing research and understanding of psychiatric disorders and its associated factors in the last decades, it is still difficult pointing out which factors lead to the development of psychiatric illnesses (Vieta et al., 2018). For bipolar disorder contradicting results have been found for many possible risk factors. For example, environmental factors have been found in some studies to trigger manic episodes, but in others they are found to be insignificant (Vieta et al., 2018). One risk factor that is commonly accepted is that of family pathology, meaning that the chance of developing bipolar disorder when it is present in your family is a lot higher compared to when it is not present in your family (Mesman et al., 2016). This points to genetic components being responsible for the development of bipolar disorder. Moreover, genetic similarities have been found between bipolar disorder and borderline personality disorder, major depression, and schizophrenia (Witt et al., 2017). These genetic components may be responsible for many phenotypical presentations like for instance personality characteristics.

By personality characteristics we mean individual differences in behaviour, ways of thinking, and feelings which are constant throughout your life. Even though different concepts exist for personality traits, the most used are the big five personality traits which are: neuroticism, extraversion, openness, conscientiousness, and agreeableness. These traits seem to be valid constructs, in the sense that everyone possesses these five traits in more or less amounts (Costa & McCrae, 1992). Earlier research has focused on the correlation between personality and bipolar disorder. So far, a positive correlation between neuroticism and bipolar disorder has been found (Sparding et al., 2017). Other studies also show that introverted people belong to the high-risk group (Christensen & Kessing, 2006). Many different outcomes are presented in different studies, however in general most studies found higher neuroticism and extraversion and lower agreeableness to be associated with bipolar disorder patients (Mesbah et al., 2019).

When talking about the risk of developing bipolar disorder and personality some scientists believe in the vulnerability hypothesis, which states that certain characteristics lead to a higher vulnerability of developing the first depressive or manic episode (Akiskal et al., 1983). Additionally, scientists have come up with the scar hypothesis, stating that personality can change as a result of one or multiple mood episodes (Clark et al., 1994). Like mentioned before, personality traits are more or less constant throughout your life. This would suggest the vulnerability hypothesis to be more likely compared to the scar hypothesis. Moreover, the vulnerability hypothesis seems to have numerous studies that prove this point of view. The scar hypothesis, on the other hand, lacks convincing evidence (Christensen & Kessing, 2006). Specific personality traits have also been associated with earlier age at onset (AAO) of the first bipolar mood episode (Christensen & Kessing, 2006). In a systematic review, differences were found between AAO and the severeness and personality in bipolar disorder patients (Engström et al., 2003). They found that an earlier AAO is linked with higher

severity and poorer treatment outcome. Additionally, the review suggests that specific personality traits like being shy and higher amounts of harm avoidance are associated with an earlier AAO.

Whereas personality traits are assumed to be rather static during the lifetime, personality functioning can fluctuate over the life course. Personality functioning is described in the DSM-V as: the ability to have an identity and self-direction, empathy, and intimacy (Buer Christensen et al., 2020). Previous research has shown that the impairment of personality functioning is closely linked to psychological disorders such as personality disorders and anxiety disorders (Clark et al., 2018) (Gruber et al., 2020). Unlike personality traits, which are said to be generally constant throughout your life, personality functioning is more considered a state and it can change over time and be trained. In a prospective study among unipolar depressed patients, when looking at personality functioning before and after a major depressive episode, no evidence was found for the scar hypothesis (Bos et al., 2018). Evidence, however, for the vulnerability hypothesis was found in this study, showing that participants who scored lower on personality functioning had an increased risk of developing a major depressive episode. This raises the question if the same applies for and how personality functioning influences the development of bipolar disorder. Since treatments have been shown to be effective in improving personality functioning, discovering these risk factors are of high importance (Leichsenring et al., 2019). Therefore, it is important to find out if personality functioning plays a role in vulnerability and if so which specific items for personality functioning cause a higher risk of developing the disorder.

One important factor in bipolar disorder is the AAO of the first mood episode. Mostly, a distinction between early (is before the age of 17), intermediate (before age 27) and late (before 46 and beyond) AAO is made (Leboyer et al., 2005). So far, they have found that early AAO is often paired with higher co-morbidity like substance abuse, anxiety, or psychotic symptoms (Cate Carter et al., 2003). Moreover, almost all studies find that patients with early AAO change between cycles more rapidly and have a higher functional impairment (Perlis et al., 2009). They also agree that the chances of recovering are smaller for early AAO compared to patients who develop it later in life. The exact construct of why some develop bipolar disorder earlier than others is still unknown.

The purpose of this study is to find possible associations between the AAO and personality traits and personality functioning. For the reason that it is possible that certain personality traits or personality functioning cause to a higher vulnerability for developing bipolar disorder. It Is of great importance to be able to profile these risk factors for bipolar disorder, since bipolar disorder has shown to be a progressive disease (Rowland & Marwaha, 2018). This means that it worsens over time when more episodes have occurred. It is also possible that the consequence of developing bipolar disorder early on in life leads to a change in certain personality traits or a change in personality functioning later in life. This information is useful to find the long-term effects of patients with bipolar disorder and being able to create more fitting help for patients who have a longer history of bipolar disorder, by teaching them how to cope with possible impairment in personality functioning or unwanted personality traits. Therefore, this research will investigate whether specific personality traits and specific impairments in personality functioning are associated with an earlier AAO of bipolar disorder.

To answer our research question, we hypothesise that patients with an early AAO have increased impairments in personality functioning compared to those with an intermediate or later AAO. Furthermore, we expect our results to be in line with the vulnerability hypothesis and previous research, which found that extraversion, neuroticism, and lower levels of agreeableness were characteristics mostly present in bipolar patients. Therefore, we hypothesise that patients with an

early AAO score higher on personality traits like extraversion and neuroticism and score lower one agreeableness.

Method

Design

For this quantitative study we will use data collected in the BINCO study, which started in 2017 and is still running. In this study environmental, immunological, endocrinological, and psychological data is collected from recently diagnosed bipolar I and bipolar II patients. The current study will be done cross-sectional using a subset of the collected data focussing on AAO and personality factors collected with the NEO- Five Factory Index (FFI) and the Severity Indices of Personality Problems-short form (SIPP-sf), also the young mania rating scale and quick inventory of depressive symptoms have been used to indicate the severity of the symptoms. The study will look in retrospect to find possible associations between the data of interest.

Participants

The study selected 69 participants who have been recently (no longer than 1 year ago), diagnosed with either bipolar I or bipolar II disorder according to the DSM IV or DSM V criteria. All patients are treated in a specialized facility in either Leiden, The Hague, or Rotterdam.

For the participants to be included in the experiment they needed to be at least 18 years or older and fulfil a diagnosis of either bipolar I or II diagnosed in the last year. We excluded participants who can't speak or read the Dutch language

Ethics

All patients with bipolar disorder in the mentioned facilities were asked to participate in the study. Patients who agreed to participate in the study have provided written informed consent. The entire study has been approved by the medical ethical committee of the Leiden University medical centre

Measurements

NEO-five factor inventory

The NEO-FFI focuses on the five personality traits of neuroticism, extraversion, openness, conscientiousness, and agreeableness (McCrae et al., 2005). The NEO-five is a self-report questionnaire consisting of 60 questions which can be rated from totally disagree, slightly disagree, neutral, agree and totally agree. All five domains of the big five are represented in the NEO and both its internal as its test-rest validity have been found to be acceptable, just as its internal and temporal reliability (Murray et al., 2003).

Severity indices of personality problems – short form (SIPP-sf)

The SIPP-sf a self-report questionnaire consisting of 60 questions derived from the SIPP-118 (Verheul et al., 2008). The SIPP-sf explores the domains of self-control, identity integration, responsibility, relational capacities, and social concordance. Self-control is defined as the ability to control your impulses and emotions. Identity integration refers to the capacity of seeing your own life as stable

and having a self. Responsibility focuses on the ability to set and achieve goals others expect from you. Relational capacities concerns feeling for others and caring about them, and also communicating your thoughts and feelings with these people. Finally, social concordance is about valuing others and being able to cooperate with them. The SIPP-sf showed good reliability and validity in clinical trial (Reijswoud et., 2021).

Young mania rating scale (YMRS) & Quick inventory of depressive symptoms (Q-IDS)

For indicating the severity of the current mood of the patients we will use the YMRS and the Q-IDS. The YMRS is a clinical interview consisting of 11 items on which the patient has to subjectively report their manic symptoms (Young et al., 1978). The Q-IDS is a self-report consisting of 16 questions evaluating the depressive symptoms of the patient (Rush et al., 2003) .

Composite international diagnostic interview (CIDI)

Finally, we will use information from the CIDI which is a structured interview for psychiatric disorders (Robins et al., 1988). We will determine the AAO by use of the CIDI.

Statistical analysis

For our data analysis we will perform various tests. First, we will test if there is an association between AAO and specific personality traits of the NEO. Secondly, we will do the same for the SIPP for personality functioning and AAO. For our first part of the analysis, we will use a regression analysis. In this regression analysis we will adjust for the current mood of the participants by adding this as a covariate in our analysis.

In our second test we will perform a regression analysis as well, but this time we will look at personality functioning scores. Similarly, we will add the current mood status of the participant as a covariate.

Results

In total 69 participants participated in the study, of which 38 filled in the NEO and 52 the SIPP. The minimum and maximum age were 19 and 61, with a mean of 35 years old. Below in table 1 you can find other information about the distribution of the population.

NEO analysis

In total 38 participants fulfilled the criteria of filling in the NEO and information about onset of their mood disorder. We performed a linear regression with the dependent variable onset of bipolar disorder, which we defined as the first either manic or depressive episode, and as independent variables the different scores for the NEO: Neuroticism, agreeableness, extraversion, openness, and conscientiousness. When performing separate analyses for the different domains only neuroticism has a significant result (B=-0,452, P=0,005). Similarly, in a model where all five domains are put in simultaneously only neuroticism is significant (B=-0,415, P= 0,016). In table 2 the results are shown for the unadjusted model, in which the first column shows the standardized beta values followed by their P-values. In the second column the results from adjusting the mood conditions are presented.

Table 1 *Distribution and characteristics of the sample population*

Variable	*N*	*Mean and SD*
Male	21	-
Female	37	-
Bipolar type 1	19	-
Bipolar type 2	40	-
Age	58	35,3 ± 11,7
Age at onset	58	19,1 ± 6,7
Neuroticism	38	42,5 ± 4,9
Extraversion	38	36,2 ± 6,4
Openness	38	35,3 ± 5,2
Agreeableness	38	43,2 ± 6,3
Conscientiousness	38	37,3 ± 7,2
Identity integration	52	26,7 ± 5,8
Responsibility	52	31,0 ± 6,5
Relational capacities	52	30,9 ± 5,2
Self-control	52	32,5 ± 5,3
Social concordance	52	34,3 ± 3,9
QIDS-Score	60	9,2 ± 5,7
YMRS-score	61	4,0 ± 3,9

Note: The results in table1 show score numbers of the used questionnaires the NEO-ffi and SIPP-sf.

SIPP Analysis

For the SIPP analysis we collected a total of 49 participants who fulfilled all necessary data to perform an analysis. Similarly, we performed a linear regression analysis with the dependent variable the onset of bipolar disorder and as independent variable the five domains of personality functioning: Identity integration, responsibility, relational capacities, self-control, and social concordance. In table 2 both the adjusted and un-adjusted values are shown of the two different models. None of the Beta values for personality functioning are significant in the un-adjusted model or the adjusted model. Identity integration shows the highest contribution of the five domains in this model but is not significant (B=0,24, p=0,21). Like for the NEO, the first column in table 2 shows the un-adjusted Beta values and the second column shows the Beta values adjusted for the mood of the participants. The adjustment has no effect on significant associations in the model.

Table 2 *Measured level of association between personality traits, functioning and age at onset of bipolar disorder*

Domain	*Un-adjusted (Beta, P-value)*	*Adjusted (Beta, P-value)*
Neuroticism	-0,42, 0,02	-0,44, 0,02
Extraversion	0,14, 0,41	0,17, 0,36
Openness	0,15, 0,38	0,16, 0,36
Agreeableness	0,07, 0,67	0,06, 0,75
Conscientiousness	0,01, 0,94	0,01, 0,94
Identity integration	0,24, 0,21	0,23, 0,26
Responsibility	-0,09, 0,63	-0,06, 0,74
Relational capacities	-0,09, 0,67	-0,11, 0,61
Self-control	0,02, 0,91	0,02, 0,92
Social concordance	0,16, 0,41	0,15, 0,46

Note: Table 2 shows the standardized Beta values and P Values of the different domains in two regression models in which one is adjusted for the current mood of the participants. Neuroticism, extraversion, openness, agreeableness, and conscientiousness belong to personality traits. Identity integration, responsibility, relational capacities, self-control, and social concordance belong to personality functioning.

Conclusion and Discussion

This study aimed to find possible associations between age at onset and certain personality traits and functioning amongst patients with bipolar disorder. The main outcome of this study is that there seems to be an association between neuroticism and developing bipolar disorder earlier in life. For personality functioning this study hasn't found any association that suggests that it leads to developing bipolar disorder earlier in life.

For our first research question we hypothesised that the scores on neuroticism and extraversion would be higher and that the scores on agreeableness would be lower. Our results suggest that only for neuroticism there is an association between developing bipolar disorder earlier in life. In both the adjusted and unadjusted model neuroticism shows a significant effect. All other factors of personality traits show no significant effect in this study. This finding is partially complementary to our hypothesis, in which we expected neuroticism to be involved. We also expected other traits like agreeableness and extraversion to be involved, but we found those not to be significant.

For the second research question we hypothesised that we would expect an increased impairment in the different factors of personality functioning in patients with a lower AAO. However, all different factors show a non-significant effect in both the un-adjusted and the adjusted model. Therefore, our

results suggest that there is no association between personality functioning and the age at which bipolar disorder develops. Since not many studies have been done to personality functioning and bipolar disorder, we set up a general non-directive hypothesis in which we stated to find an effect, but not necessarily what kind of effect. This hypothesis has been rejected since no domain of personality functioning seemed to be involved in an earlier AAO.

Previous research had shown that there is a positive correlation between neuroticism and bipolar disorder (Sparding et al., 2017). Adding to these earlier findings, our results suggest that neuroticism is not only involved in having a bigger risk at developing bipolar disorder, but also that there is an association for developing it earlier on in life. Since patients with an early AAO have severe symptoms compared to those who develop it later on it is possible that neuroticism is a factor that contributes to this severity.

Other studies also found extraversion and agreeableness to be related to developing bipolar disorder. This study, however, found no association between these factors and developing it earlier on in life. This could suggest that these factors play a role in whether you develop bipolar disorder or not, but not when you develop it in your life.

Not many studies have been done looking at the relation between personality functioning and bipolar disorder. Previous research has shown that personality functioning is linked to other psychological disorders like personality disorders (Clark et al., 2018). This study found no association between personality functioning and the age at which bipolar disorder develops. This does not mean that personality functioning is not associated with developing bipolar disorder at all, but future studies should look at that by involving a healthy control group.

This quantitative study aimed to measure different personality traits and functioning and the relation with an earlier AAO in bipolar patients. We tried to improve the validity of the study by adjusting for the current mood of the patients. However, the effect of this adjustment was smaller than we anticipated and no differences that lead to any different conclusions were measured. Nevertheless, it should always be taken into account that the questionnaires were taken at one specific time point and therefore, the conditions of the participants at that moment affect the scores on the questionnaires.

Moreover, the study is done with bipolar patients only, therefore the results can only be generalized among bipolar patients and not compared to a healthy population. In short, our study has shown that within the population of people that develop bipolar disorder, those who are more neurotic have a higher chance to develop it at an earlier stage in life compared to those who are less neurotic. Our results are not able to draw any conclusions about the relation between personality traits or functioning and the healthy population.

Our purpose was to find possible associations between AAO and personality traits and functioning. This study succeeded in finding that neuroticism is associated with an earlier AAO. This could be beneficial for future studies to find out whether this association is caused by neuroticism leading to an earlier AAO or an earlier AAO leading to a change in personality trait. The result of that would be that another risk factor is found for developing bipolar disorder, which could help in the prevention of bipolar disorder or the severity of the disorder. The other option would be that people suffering from early on from bipolar disorder are helped with coping with their neuroticism which could be a result from having a longer history of bipolar disorder. This study is therefore a foundation for future research in finding the causes and results of bipolar disorder.

Future studies can focus on expanding the knowledge of risk factors that can lead to developing bipolar disorder. For instance, even though this study has found no evidence for personality functioning being related to bipolar disorder, it is one of the few studies who has tried to find a relation between these two factors. Future studies can be done to look at the relation between personality functioning and bipolar patients compared to healthy individuals.

From the knowledge of this study and previous studies we know that neuroticism is a risk factor for developing bipolar disorder in an early stage in life. Future studies should try to find more risk factors leading to better screening programs and helping in creating potential prevention programs or programs that help patients cope with long term effects of bipolar disorder.

***Acknowledgements**: This study is done under guidance of M. Koenders as a part of the BINCO study. Much gratitude is given for the opportunity to work together on this project.*

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