Psychiatr. Pol. 2015; 49(3): 477–488
PL ISSN 0033-2674 (PRINT), ISSN 2391-5854 (ONLINE)
www.psychiatriapolska.pl
DOI: http://dx.doi.org/10.12740/PP/29415

Risk factors for suicide among children and youths with spectrum and early bipolar disorder

Aleksandra Rajewska-Rager[1], Natalia Lepczyńska[2], Piotr Sibilski[2]

[1] Department of Adult Psychiatry, Chair of Psychiatry, Poznan University of Medical Sciences
Head: prof. dr hab. n. med. J. Rybakowski

[2] Department of Child and Adolescent Psychiatry, Poznan University of Medical Sciences
Head: prof. dr hab. n. med. A. Rajewski

Summary

In recent years much attention has been given to determine risk factors for suicide among adults with bipolar disorder. Such studies concerning children and youths, which would also take into account the specificity of the developmental age, are still too few. The ability to identify risk factors for children and youths with mood disorders, as well as the possibility to monitor them, is an essential element in preventing suicidal behaviours. Previous studies have clearly indicated that in the group of patients with an early onset of the bipolar disorder the occurrence of suicidal thoughts and intentions were significantly increased. Identifying the risk of suicide is hindered further by the complexity of the phenomenon, which is a compound interaction of various factors: biological, environmental, sociological, psychological and clinical. This is especially true with young adults suffering from mental illness and presenting a number of other psychopathological symptoms. The following paper introduces and reviews the results of current studies, which analysed the risk factors for suicide among children and youths with bipolar spectrum or already diagnosed with bipolar disorder. For this purpose we conducted the overview of recent years literature available in PubMed/MEDLINE database, including the following search criteria: early onset bipolar disorder, bipolar disorder in children and young people, the spectrum of bipolar disorder, and suicidal ideation, suicidal intent, suicide.

Key words: bipolar disorder in children and young people, suicide risk factors, bipolar spectrum

The study was carried out within the project financed by the NCN granted under decision No 2011/03/D/NZ5/06146.

Introduction

The purpose of this work is to review researches on the risk of suicide in children and adolescents with spectrum and bipolar disorder. Since the emergence of thoughts, tendencies and finally suicide attempts are associated with many factors, we included researches on the influence of demographic, psychosocial, clinical and biological factors on the occurrence of risk of suicide. At the end of this paper a set of scales and questionnaires, which may be helpful in the suicide risk assessment in children and adolescent with bipolar disorder were attached.

The data from the World Health Organisation shows that close to a million people commit suicide worldwide each year. This indicates one death by suicide every 40 seconds, across all age groups. The phenomenon is rare among young children but its frequency increases with age, reaching its peak between the ages of 19 and 23. Suicide is one of the most prevalent causes of death in the developmental age. In accordance with current data, suicide is believed to be the fourth most frequent cause of death in children between ages of 5 and 14, and the third in the 15 to 24 age group [1]. The suicide rate has been systematically on the rise in Poland in recent years and the death rate becomes an increasing problem for the public health care system. According to EUROSTAT data from 2008 the suicide rate in Poland in the 15 to 19 age group is one of the highest in the European Union: for every 100,000 of youths in this age group, average 10.28 people committed suicide. However, this number is probably understated due to erroneous classification of some of those deaths as unintentional or accidental [2]. It is even more difficult to evaluate the number of suicide attempts (SA) among youths since not every young adult who attempts suicide enters into medical care. The statistic may be even as high as 4,000 to 5,000 yearly. It is highlighted that the frequency of suicidal thoughts and suicidal ideation (SI) is higher in the developmental age than among adults whose suicide attempts more often result in death. In young patients under psychiatric care the risk of death by suicide is 5 times higher than in the general population. Current research data indicates that the most important risk factors for suicide are underlying psychological disorders [3, 4]. It is estimated that 70–91% of young adults who experienced suicidal thoughts or who attempted suicide were also diagnosed with a mental disorder or illness. The dominant disorders were: mood disorders (depression, bipolar disorder), anxiety disorders, abuse of psychoactive drugs, behavioural disorders [5]. Another substantial risk factor is the co-occurrence of somatic diseases, especially chronic diseases.

Risk of SA and SI in children and youths with spectrum and the diagnosis of bipolar disorder

It has been determined that children and youths with mood disorders are more likely to attempt suicide compared to healthy people of the same age group. This is supported by the studies with a control group [6], as well as prospective studies [7–9] and retrospective studies [10–13]. Among mental illnesses taken into account,

the largest risk of suicide is carried by the bipolar disorder (BP) [5]. The studies unequivocally indicate that even up to 65% of adults with bipolar disorder showed symptoms in childhood and people with an early onset of the illness were at a greater risk of suicidal behaviour [14, 15]. In their research on a group of 307 patients, Slama et al. concluded that there was a strong correlation between suicide attempts and the bipolar disorder among people who had started exhibiting symptoms in adolescence [16]. This result is in concurrence with another study conducted by Carter et al. who analysed 320 patients diagnosed with the bipolar disorder types I and II. The researchers compared the frequency of suicidal thoughts or attempts in two groups: a) patients who exhibited symptoms before the age of 18 (74.5% attempted suicide or thought about it); and b) those who had the onset of the disease after that age (56% had SI or SA) [17]. In another study, conducted by Rende et al. on a group of 438 patients between ages of 7 and 17 diagnosed with spectrum of bipolar disorder, the subjects were evaluated through the use of a structured questionnaire K-SADS (Kiddie-SADS), which indicated that early onset of bipolar disorder is linked with a higher risk of suicidal behaviours [18]. A recent study analysed 413 young patients diagnosed with BP I (n = 244), BP II (n = 28) and BP not otherwise specified (n = 141) concluded that 50–60% of subjects had experienced SI, and 20–25% had attempted suicide. All these studies clearly indicate there is an increased risk of suicide attempts in patients with early onset of the bipolar disorder and demonstrates the necessity for early intervention in this particular group [19].

Analysis of risk factors for suicide among children and youths with spectrum and diagnosis of bipolar disorder

Strict criteria for diagnosis of bipolar disorder in children and youths, like in adults, do not allow the identification of risk groups and prodromal symptoms of the illness. The change of approach towards diagnosing affective disorders allowed to determine the spectrum of symptoms of the illness in developmental age. It drew attention to the fact that these symptoms may be associated with a higher risk of suicide. In a study of Goldstein et al., which involved 405 patients fulfilling the criteria for bipolar disorder, the authors determined that the risk of suicide among patients from the studied group (7 to 17 year olds) was associated with the following factors: older age, the history of episodes of mania, mixed episodes, psychotic symptoms, panic disorder, family history of suicide attempts, auto-aggressive behaviour, comorbid substance use disorder and psychiatric hospitalisation in the past. The most significant predictors for suicide attempt were: mixed episodes, psychotic symptoms, auto-aggressive behaviour, panic disorder, substance use disorder and hospitalisation in the past. Kochman et al., in their two-years prospective study on a group of patients diagnosed with depression (7–17 year-olds), have shown that 43% of the patients met the criteria of BP diagnosis. Furthermore, they found a significant connection between cyclothymic personality traits and suicidal thoughts and intentions [20]. Another study, conducted by Rucklidge,

on a group of 63 youths (BP n = 24, control n = 39, ages 13–17) resulted in a list of influential factors which predispose youths to suicidal attempts: helplessness, low self-esteem, external locus of control and poor ability to cope with negative emotions [21].

Given the results of all those aforementioned studies, we may surmise that the risk of suicidal behaviours among young people is determined by various factors, which may be divided as follows: demographic, social, psychological, clinical and biological.

Demographic risk factors

Gender is one of the most important demographic risk factors, which increase the likelihood of suicidal thoughts or attempts in patients with BP. Girls are noted to attempt suicide much earlier than boys, and this disparity is especially prominent between the ages of 13 and 17. A research by Dilsaver et al., on a group of 247 patients with BP type I and II, has shown that girls experienced suicidal thoughts twice more often than boys and attempted suicide even three times more frequently [22]. However, it is noted that this indicator is higher among boys after the age of 17 [23]. Another significant risk factor is the age at which the onset of the illness occurs. Studies have shown a correlation between an early onset of BP and the increased risk of SA in the course of the illness [11]. Interestingly, among patients with an early diagnosis of BP, older people were more prone to attempt suicide. This may be explained by the fact that although early onset of the disorder is linked with a higher risk of SA, that risk also increases with age. This correlation however may be only one of many factors, like the fact that older children tend not to be under such strict parental supervision as younger children, which may lead to more opportunities to attempt suicide. Other factors may also correlate with age, such as the intensification of the disorder, its type or the frequency of co-occurring axis II disorders [24]. Another factors like race (Caucasian) or place of residence (large cities) have been identified as risk factors for SI and SA among adults. However, studies concerning the group of children and youths have not shown conclusive results yet [25, 26].

Psychological and social factors

The following factors have been identified in the literature as significant in determining the risk of suicide in patients with BP: stress factors, family situation, situation in peer group, failure in school. Among stress factors which may increase the risk of SI and SA are: loss of a loved one (or of some important person), experience of violence, broken family, pregnancy [27, 28]. Suicides happen several times more frequently in dysfunctional families or in families which exhibited inconsistency of parental education or disrupted communication. The risk is higher when one of the parents has mental health issues like history of suicide attempts, depression, psychoactive substance abuse [11, 29, 30]. Studies have also shown that the patients with BP who attempted suicide within the last year also reported an increased number of

stressful events in the family as compared to patients without suicidal tendencies [11]. Patients attempting suicide most frequently reported stress factors in the family such as a greater number of conflicts (especially with the mothers) or frequent disputes with the parents. The literature cites numerous hypotheses about the role of the relationship with the parents in suicide attempts by children and youths. A theory introduced by Sutter in 1964 points to the lack or the crisis of authority syndrome during puberty [31]. Sutter also underscores a very significant problem of a child unable to meet its parents' expectations and subsequently feeling the sense of helplessness. The most important psychological factors often linked with the increased risk of SI and SA are impulsiveness, aggression and a sense of hopelessness and powerlessness. A growing sense of helplessness is clearly correlated with an increase of suicidal thoughts and is believed to be one of the key factors in the risk of suicide attempts among people with BP [12, 21, 32]. Impulsiveness is a significant factor as well, however, the connection between the biological origin of impulsiveness and the affective disruption, which may lead people with BP to attempt suicide, is still to be determined [6, 33, 34].

Clinical risk factors

Recent studies have shown that the mixed episode, often seen in young patients with BP, is significantly correlated with an increased risk of SA [35]. Dilsaver's research from 2005 (n = 247) on a group of patients diagnosed with depression has shown that 40.5% of them exhibited symptoms of BP type I or II. Within the group with diagnosed bipolar disorder, the relation between occurrences of mixed episodes and SA has been shown only among girls [22]. However, currently the term "mixed episodes" is being replaced with the term "mixed mood symptoms." Mixed mood, in its definition, includes the combination of such symptoms as: greater energy, impulsiveness, agitation (which, in mania, typically occurs along with irritability) and powerlessness (occurring in depression). Such symptoms of mixed mood may be clinically observed in the form of depression with psychomotor agitation or hypomania with irritability. These conclusions have been taken into account by the changes in the American classification of mental diseases, DSM-5, from which the term "mixed episode" has been excluded. The mixed mood symptoms appear to be indeed linked with both the early onset of the disorder as well as the occurrence of SI and SA [23, 36].

A significant clinical indicator of a patient's physical or mental state is their general functioning and quality of life (QoL). The results of the studies clearly show that the decline of general functioning among children and youths (as well as adults) is correlated with a greater risk of SA and SI [29, 37]. The severity of the illness directly impacts the QoL and, when assessed by the number of psychiatric hospitalisations, it is a factor for suicidal thoughts among people with BP. As mentioned previously, the risk of SA and SI among patients with BP is greatly increased by the co-occurrence of other illnesses, of which the most significant are abuse of psychoactive substances, anxiety disorder (especially panic disorder), ADHD and eating disorders [11, 19].

The conclusion here is that the greater the number of coexisting problems, the greater the risk of suicide [23].

Biological risk factors

In recent years researchers have been intensively searching for biological and genetic factors which may correlate with suicidal behaviour. So far they have not found single specific marker connected with increased risk of SI and SA in children and youths with PBD. Current research indicates a relation between suicidal behaviour and: a) the activity of particular neurotransmitters (lowered concentration of 5-Hydroxyindoleacetic and homovanillic acids in the cerebrospinal fluid, an increased number of 5HT-2A receptors in the brain and platelets, lowered platelets 5-HT reuptake, lowered MAO platelets and dopamine activity); b) bioelectric functions of the brain (reduction of various parameters for evoked potentials, disrupted sleeping patterns); c) endocrine system (lack of cortisol suppression after administration of dexamethasone, decreased TSH response to TRH, lowered melatonin concentration during the night); d) lipid metabolism (lowered cholesterol concentration); e) immune system (increased concentration of interleukin-2 receptors, increased cytokines and chemokines in the cerebrospinal fluid); f) blood-brain barrier functions (increased S100B protein in the serum); g) genotype (polymorphism of the tyrosine hydroxylase or of the serotonin transporter). Many of the above mentioned factors are considered as playing an important role in suicidal behaviour in adults with BP, but in the group of children and adolescents with BP it is still necessary to make further replication studies and additional research [38–41]. The lowered levels of the Omega-3 fatty acids are currently believed to be of particular importance, since they correlate with a higher risk of suicide in patients diagnosed with major depression and BP [42, 43]. The disruption of the functions of hypothalmic-pituitary-adrenal axis (HPA) is also identified as a significant factor in neurobiological causes of suicide. One factor especially, the response to dexamethasone test (DST), seems a likely candidate for the marker of increased risk of suicide [44]. Still, there is insufficient scientific evidence to support this hypothesis in regards to the young age group. Another biological factor analysed in numerous studies is the functioning of the prefrontal cortex (PFC), which correlates with impulsive-aggressive and suicidal behaviour among adults and adolescents alike. Research has shown a strong connection between suicidal attempts resulting in death and the hypofunction of the ventromedial and ventrolateral areas of the prefrontal cortex in tests by positron emission tomography [45]. Studies completed to date indicate particularly the role of serotonin transporter gene, SERT (there is an association between a short s-allele and suicide attempts in BP) and serotonin receptors HTR1A, HTR2A and HTR1B, and the monoamine oxidase promotor (MAOA) [46].

Tools most frequently used in evaluating the risk of suicide in PBD

There are many clinical studies concerning the risk of suicide attempts in adult population. Pużyński has determined the features of the risk of suicide in affective disorders among adults, including the following factors increasing that risk: a) clinical symptoms of depressive disorders; b) physical and mental well-being of patients during remission; c) patient's biological traits (age, gender, coexisting diseases); d) traumatic experiences in the past; e) low self-esteem, auto-aggression; f) social situation (social support) [47]. In the children and youth population the most important factors are: a) intensifying episodes of the disorder (especially in depression); b) occurrence of mixed mood; c) family history (history of mood disorders and suicide in the family); d) auto-aggressive behaviour; e) sense of hopelessness, impulsiveness; f) general inability to function; g) other coexisting conditions; h) early onset of symptoms. Given the diagnostic difficulties in this particular group of patients and the possibility of overlooking symptoms indicating the risk of suicide attempts, in clinical practice it would be beneficial to utilise screening scales, which allow to isolate at risk individuals. The most frequently utilised scales for this age group are represented in table 1.

Table 1. **Scales useful in evaluating the risk of suicide in children and youths with BP**

Name	Description
K-SADS-PL Questionnaire [48]	Structured interview (for children between ages of 6–18), a collection of diagnostic criteria and sub-scales assessing the symptoms of the major psychological disorders and their severity, including an evaluation of the risk of suicide.
Adolescent Suicide Interview (ASI) [49]	Half-structured interview with four divisions to classify the symptoms of major depression, suicidal ideation, the severity of suicide attempts and exposure to suicide.
Child Suicide Potential Scales (CSPS) [50]	One of the earliest half-structured interviews for gathering information about suicidal behaviour in adolescents.
Evaluation of Suicide Risk Among Adolescents and Imminent Danger Assessment (ESRAIDA) [51]	Two-step screening interview to evaluate suicide risk and suicidal behaviours.
Suicidal Behaviours Interview (SBI) [52]	22-point scale created to assess the present risk of suicidal behaviours in adolescents.
Tool for Assessment of Suicide Risk Adolescent Version (TASR-A) [53]	6-point scale determining the levels of high, medium and low suicide risk.
Beck Scale for Suicide Ideation (BSI) [54]	19-point scale to evaluate suicidal ideation and to monitor responsiveness to treatment.
The Harkavy-Asnis Suicide Scale (HASS) [55]	Subjective scale assessing suicidal behaviours and factors allowing to predict suicide attempts.

table continued on the next page

Suicide Ideation Questionnaire (SIQ) [56]	30-point scale (for older children) and 15-point SIQ-J (for younger children), useful in screening suicidal ideation.
Suicide Behaviours Questionnaire (SBQ) [57]	Scale to evaluate past suicidal behaviours.
Beck Hopelessness Scale (BHS) [58]	20-point subjective scale, assessing predictions and expectations of the future and loss of motivation.
Child Suicide Assessment (CSA) [59]	Scale determining the risk of suicide and the necessity of preventive steps before the suicide attempt takes place (especially with children under twelve years old)

Recapitulation

Presented review of the literature shows that the occurrence of thoughts and suicidal tendencies in the period of human development may be a significant diagnostic and therapeutic problem. The introduction of the concept of "bipolar spectrum disorder" may allow a better assessment of the clinical symptoms occurring during development. An overview of trends in the ICD and DSM-5 classifications with regard to children and adolescents goes beyond the purpose of this work, however, the analysis of risk factors of suicide attempt shows that the presence of symptoms of affective spectrum disorder can be a valuable clue to take early interventions to reduce the therapeutic risk of suicide. According to the data from the literature the most important factors for such risks are: intensifying of disorder episodes, mixed mood, family history (mood disorders and suicide), auto-aggressive behaviour, impulsiveness, general inability to function, sense of hopelessness, co-occurring conditions (especially psychoactive substance abuse) and an early onset of symptoms. Biological factors, though believed to play an important role in etiopathogenesis of suicidal behaviour in children and young adults, are yet to be sufficiently studied. Research conducted so far has not provided conclusive evidence of specific risk factors. Preventing suicide behaviours in children with the BP risk should be prioritised by mental health care. The ability to correctly identify risk factors as well as knowledge of specific tools useful for identifying such factors can help to significantly improve the early diagnostics and therapeutic interventions in children and adolescents.

References

1. Heron M. Deaths: *Leading causes for 2010*. Nat. Vital Stat. Rep. 2013; 62(6): 1–97.
2. *Europe in figures – Eurostat yearbook 2008*. Luxembourg: Office for Official Publications of the European Communities; 2009.

3. Gould M, King R, Greenwald S, Fisher P, Schwab-Stone M, Kramer R. et al. *Psychopathology associated with suicidal ideation and attempts among children and adolescents*. J. Am. Child Adolesc. Psychiatry 1998; 37: 915–923.
4. Kessler RC, Borges G, Walters EE. *Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey*. Arch. Gen. Psychiatry 1999; 56: 617–626.
5. Baldessarini RJ, Tondo L. *Suicide risk and treatments for patients with bipolar disorder*. J. Am. Med. Assoc. 2003; 290: 1517–1518.
6. Brent DA, Perper JA, Moritz G, Baugher M, Roth C, Balach L. et al. *Stressful life events, psychopathology, and adolescent suicide: a case control study*. Suicide Life Threat. Behav. 1993; 23(3): 179–187.
7. Lewinsohn PM, Klein DN, Seeley JR. *Bipolar disorders in a community sample of older adolescents: prevalence, phenomenology, comorbidity and course*. J. Am. Acad. Child Adolesc. Psychiatry 1995; 34: 454–463.
8. Srinath S, Janardhan Reddy YC, Girimaji SR, Seshadri SP, Subbakrishna DK. *A prospective study of bipolar disorder in children and adolescents from India*. Acta Psychiatr. Scand. 1998; 98(6): 437–442.
9. Geller B, Tillman R, Bolhofner K, Zimerman B. *Child bipolar I disorder: prospective continuity with adult bipolar I disorder; characteristics of second and third episodes; predictors of 8-year outcome*. Arch. Gen. Psychiatry 2008; 65(10): 1125–1133.
10. Bhangoo RK, Dell ML, Towbin K, Myers FS, Lowe CH, Pine DS. et al. *Clinical correlates of episodicity in juvenile mania*. J. Child Adolesc. Psychopharmacol. 2003; 13(4): 507–514.
11. Goldstein TR, Birmaher B, Axelson D, Ryan ND, Strober MA, Gill MK. et al. *History of suicide attempts in pediatric bipolar disorder: factors associated with increased risk*. Bipolar Disord. 2005; 7(6): 525–535.
12. Papolos D, Hennen J, Cockerham MS. *Factors associated with parent-reported suicide threats by children and adolescents with community-diagnosed bipolar disorder.* J. Affect. Disord. 2005; 86(2–3): 267–275.
13. Bridge JA, Goldstein TR, Brent DA. *Adolescent suicide and suicidal behavior*. J. Child Psychol. Psychiatry 2006; 47(3–4): 372–394.
14. Leverich GS, Altshuler LL, Frye MA, Suppes T, Keck PE Jr, McElroy SL. et al. *Factors associated with suicide attempts in 648 patients with bipolar disorder in the Stanley Foundation Bipolar Network*. J. Clin. Psychiatry 2003; 64: 506–515.
15. Perlis RH, Miyahara S, Marangell LB, Wisniewski SR, Ostacher M, DelBello MP. et al. *Longterm implications of early onset in bipolar disorder: Data from the first 1000 participants in the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD)*. Biol. Psychiatry 2004; 55: 875–881.
16. Slama F, Bellivier F, Henry C, Rousseva A, Etain B, Rouillon F. et al. *Bipolar patients with suicidal behavior: toward the identification of a clinical subgroup*. J. Clin. Psychiatry 2004; 65(8): 1035–1039.
17. Carter TD, Mundo E, Parikh SV, Kennedy JL. *Early age at onset as a risk factor for poor outcome of bipolar disorder*. J. Psychiatr. Res. 2003; 37(4): 297–303.
18. Rende R, Birmaher B, Axelson D, Strober M, Gill MK, Valeri S. et al. *Childhood-onset bipolar disorder: Evidence for increased familial loading of psychiatric illness*. J. Am. Acad. Child Adolesc. Psychiatry 2007; 46(2): 197–204.

19. Goldstein TR, Ha W, Axelson DA, Goldstein BI, Liao F, Gill MK. et al. *Predictors of prospectively examined suicide attempts among youth with bipolar disorder*. Arch. Gen. Psychiatry 2012; 69(11): 1113–1122.
20. Kochman FJ, Hantouche EG, Ferrari P, Lancrenon S, Bayart D, Akiskal HS. *Cyclothymic temperament as a prospective predictor of bipolarity and suicidality in children and adolescents with major depressive disorder*. J. Affect. Disord. 2005; 85(1–2): 181–189.
21. Rucklidge JJ. *Psychosocial functioning of adolescents with and without paediatric bipolar disorder*. J. Affect. Disord. 2006; 91(2–3):181–188.
22. Dilsaver SC, Benazzi F, Rihmer Z, Akiskal KK, Akiskal HS. *Gender, suicidality and bipolar mixed states in adolescents*. J. Affect. Disord. 2005; 87(1): 11–16.
23. Nock MK, Borges G, Bromet EJ, Cha CB, Kessler RC, Lee S. *Suicide and suicidal behavior*. Epidemiol. Rev. 2008; 30: 133–154.
24. Abreu LN, Lafer B, Baca-Garcia E, Oquendo MA. *Suicidal ideation and suicide attempts in bipolar disorder type I: an update for the clinician*. Rev. Bras. Psiquiatr. 2009; 31(3): 271–280.
25. Hauser M, Galling B, Correll C. *Suicidal ideation and suicide attempts in children and adolescents with bipolar disorder: a systematic review of prevalence and incidence rates, correlates, and targeted interventions*. Bipolar Disord. 2013; 15(5): 507–523.
26. Goldstein TR, Axelson DA, Birmaher B, Brent DA. *Dialectical behavior therapy for adolescents with bipolar disorder: a one year open trial*. J. Am. Acad. Child Adolesc. Psychiatry 2007; 46(7): 820–830.
27. Agerbo E, Nordentoft M, Mortensen PB. *Familial, psychiatric, and socioeconomic risk factors for suicide in young people: nested case-control study*. BMJ 2002; 325(7355): 74.
28. Lewinsohn PM, Seeley JR, Hibbard J, Rohde P, Sack WH. *Cross-sectional and prospective relationships between physical morbidity and depression in older adolescents*. J. Am. Acad. Child Adolesc. Psychiatry 1996; 35(9): 1120–1129.
29. Algorta GP, Youngstrom EA, Frazier TW, Freeman AJ, Youngstrom JK, Findling RL. *Suicidality in pediatric bipolar disorder: predictor or outcome of family processes and mixed mood presentation?* Bipolar Disord. 2011; 13(1): 76–86.
30. Carballo JJ, Harkavy-Friedman J, Burke AK, Sher L, Baca-Garcia E, Sullivan GM. et al. *Family history of suicidal behavior and early traumatic experiences: additive effect on suicidality and course of bipolar illness?* J. Affect. Disord. 2008; 109(1–2): 57–63.
31. Sutter JM, Luccioni H, Scotto JC. *Suicide and loss of authority*. Hyg. Ment. 1964; 53: 197–204.
32. Valtonen HM, Suominen K, Mantere O, Leppämäki S, Arvilommi P, Isometsä ET. *Prospective study of risk factors for attempted suicide among patients with bipolar disorder*. Bipolar Disord. 2006; 8: 576–585.
33. Swann AC, Dougherty DM, Pazzaglia PJ, Pham M, Steinberg JL, Moeller FG. *Increased impulsivity associated with severity of suicide attempt history in patients with bipolar disorder*. Am. J. Psychiatry 2005; 162: 1680–1687.
34. Leibenluft E, Rich BA, Vinton DT, Nelson EE, Fromm SJ, Berghorst LH. et al. *Neural circuitry engaged during unsuccessful motor inhibition in pediatric bipolar disorder*. Am. J. Psychiatry 2007; 164(1): 52–60.
35. Leibenluft E, Charney DS, Pine D. *Researching the pathophysiology of pediatric bipolar disorder*. Soc. Biol. Psychiatry 2003; 53: 1009–1020.
36. Axelson DA, Birmaher B, Strober M, Gill MK, Valeri S, Chiappetta L. et al. *Phenomenology of children and adolescents with bipolar spectrum disorders*. Arch. Gen. Psychiatry 2006; 63: 1139–1148.

37. Craney JL, Geller B. *A prepubertal and early adolescent bipolar disorder-I phenotype: review of phenomenology and longitudinal course*. Bipolar Disord. 2003; 5(4): 243–256.
38. Arango V, Underwood MD, Gubbi AV, Mann JJ. *Localized alterations in pre – and postsynaptic serotonin binding sites in the ventrolateral prefrontal cortex of suicide victims*. Brain Res. 1995; 688: 121–133.
39. Bondy B, Erfurth A, de Jonge S, Krüger M, Meyer H. *Possible association of the short allele of the serotonin transporter promoter gene polymorphism (5-HTTLPR) with violent suicide*. Mol. Psychiatry 2000; 5(2): 193–195.
40. Gorwood P, Batel P, Adès J, Hamon M, Boni C. *Serotonin transporter gene polymorphisms, alcoholism, and suicidal behavior*. Biol. Psychiatry 2000; 48(4): 259–264.
41. Ernst C, Mechawar N, Turecki G. *Suicide neurobiology*. Prog. Neurobiol. 2009; 89: 315–333.
42. Huan M, Hamazaki K, Sun Y, Itomura M, Liu H, Kang W. et al. *Suicide attempt and n-3 fatty acid levels in red blood cells: a case control study in China*. Biol. Psychiatry 2004; 56(7): 490–496.
43. Sublette ME, Hibbeln JR, Galfalvy H, Oquendo MA, Mann JJ. *Omega-3 polyunsaturated essential fatty acid status as a predictor of future suicide risk.* Am. J. Psychiatry 2006; 163: 1100–1102.
44. Coryell W, Schlesser M. *The dexamethasone suppression test and suicide prediction*. Am. J. Psychiatry 2001; 158: 748–753.
45. Oquendo MA, Placidi GP, Malone KM, Campbell C, Keilp J, Brodsky B. et al. *Positron emission tomography of regional brain metabolic responses to a serotonergic challenge and lethality of suicide attempts in major depression*. Arch. Gen. Psychiatry 2003; 60(1): 14–22.
46. Manuck SB, Flory JD, Ferrell RE, Mann JJ, Muldoon MF. *A regulatory polymorphism of the monoamine oxidase-A gene may be associated with variability in aggression, impulsivity, and central nervous system serotonergic responsivity*. Psychiatry Res. 2000; 24;95(1): 9–23.
47. Pużyński S. *Depresje*. Warsaw: PZWL Medical Publishing; 1988.
48. Kaufman J, Birmaher B, Brent D, Rao U, Flynn C, Moreci P. et al. *Schedule for Affective Disorders and Schizophrenia for School-Aged Children – Present and Lifetime (K-SADS-PL): Initial reliability and validity data*. J. Am. Child Adolesc. Psychiatry 1997; 36: 980–988.
49. Lucas C. *The Multimedia Adolescent Suicide Interview.* New York: Columbia University, New York State Psychiatric Institute; 1997.
50. Ofek H, Weizman T, Apter A. *The child suicide potential scale: inter-rater reliability and validity in Israeli in-patient adolescents*. Isr. J. Psychiatry Relat. Sci. 1998; 35: 253–261.
51. Rotheram-Borus M, Bradley J. *Triage model for suicidal runaways*. Am. J. Orthopsychiatry 1991; 61: 122–127.
52. Reynolds W. *Development of a semistructured clinical interview for suicidal behaviors in adolescents*. Psychol. Assess. 1990; 2: 382–393.
53. Kutcher S, Chehil S. *Suicide risk management: A manual for health professionals*. Malden, Massachusetts, USA: Blackwell Publishing Ltd; 2007, doi: 10.1002/978047075 0933.
54. Beck A, Kovacs M, Weissman A. *Assessment of suicidal intention: The Scale for Suicidal Ideation*. J. Consult. Clin. Psychol. 1979; 47: 343–352.
55. Harkavy Friedman J, Asnis G. *Assessment of suicidal behavior: A new instrument*. Psychiatr. Ann. 1989; 19: 382–387.
56. Reynolds W. *A school-based procedure for the identification of adolescents at risk for suicidal behaviors*. Fam. Commun. Health 1991; 14: 64–75.
57. Cotton C, Peters D, Range L. *Psychometric properties of the Suicidal Behaviors Questionnaire*. Death Stud. 1995; 19: 391–397.

58. Beck A, Weissman A, Lester D, Trexler L. *The measurement of pessimism: The Hopelessness Scale*. J. Consult. Clin. Psychol. 1974; 42: 861–865.
59. Larzelere R, Andersen J. *Child suicide assessment*. Boys Town, NE: Father Flanagan's Boys' Home; 1998.

Address: Aleksandra Rajewska-Rager
Department of Adult Psychiatry
Poznan University of Medical Sciences
62-170 Poznań, Szpitalna Street 27/33