Chapter 11
Anhedonia and Risk of Suicide: An Overview

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Abstract The studies of the relationship between anhedonia and risk of suicide have led to conflicting results. The aim of the present paper is to review the different studies and to propose a conceptual model of anhedonia allowing to understand the different role of anhedonia in the risk of suicide.

Keywords Anhedonia • Suicide • Depression • Schizophrenia

Abbreviations

BDI	Beck Depression Inventory
PAS	Physical Anhedonia Scale
SADS	Schedule for affective disorders and schizophrenia
SAS	Social Anhedonia Scale
SCID	Structured Clinical Interview for diagnosis

11.1 Introduction

Anhedonia, the lowered ability to experience pleasure, constitutes either a symptom that characterizes various psychiatric disorders or a trait characterizing the personality [1]. When anhedonia is a symptom of a particular psychiatric disorder its

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duration can be the same that the duration of the disorder. When anhedonia is a trait it can have a long-term stability.

Several studies have suggested that anhedonia is associated with an elevated risk of suicide but other studies, paradoxically, have suggested that anhedonia could be associated with a lower risk of suicide.

In the present overview we present the different studies and discus the reasons explaining the discrepancy found in the literature. Then we proposed a model explaining the different roles of anhedonia on the risk of suicide.

11.2 Anhedonia and Elevated Risk of Suicide

Seven cross-sectional studies have reported in psychiatric patients significant correlations or associations between anhedonia scales and items rating suicide risk (Table 11.1).

Robins and Alessi [2] have studied depressive symptoms and suicidal behaviour in 64 adolescent psychiatric patients using a structured interview and the schedule for affective disorders and schizophrenia (SADS). Forty-nine patients had mood disorders. The SADS assessed suicidal tendencies, expressed intent to die, number of previous gestures or attempts, and the lethality of the most recent attempt. Pearson's correlations by each of the four suicide items and each of 38 SADS items were calculated. Anhedonia was significantly associated with suicidal tendencies, seriousness of intent and medical lethality.

Table 11.1 Relationships between anhedonia and risk of suicide

	Number	Diagnosis	Study	Measure	Association
Robins and Alessi [2]	49	Mood disorders	C	SADS	+
Nordström et al. [3]	32	Parasuicide	P	PAS	+
Loas and Boyer [4]	61	Major depression	C	PAS	+
Nock and Kazdin [5]	175	Psychiatric subjects	C	CDS	+
Kelly et al. [6]	97	Schizophrenia	C	SCID	+
Loas et al. [7]	150	Schizophrenia	P	PAS	+
Agrawal et al. [8]	1,041	Healthy	C	Ad hoc Q	+
	1,428	Heroin-dep			
Fawcett et al. [9]	954	Major aff disorders	P	SADS	+
Oei et al. [10]	46	Depression	C	PAS, SAS	+
Watson and Kucala [11]	39	Psychiatric subjects	P	Watson anh scale	–
Fenton et al. [12]	187	Schizophrenia	P		–
Loas et al. [14]	224	Healthy	C	PAS	
Loas et al. [15]	103	Parasuicide	C	PAS	+
Loas et al. [16]	103	Parasuicide	P	PAS	–
Etain et al. [17]	350	Euthymic bipolar	C	PAS	

BDI Beck Depression Inventory, *CDS* Children depression scale, *PAS* Physical Anhedonia Scale, *SADS* Schedule for affective disorders and schizophrenia, *SAS* Social Anhedonia Scale, *SCID* Structured Clinical Interview for diagnosis, *C* cross sectional study, *P* prospective study

One study [3] has compared 32 suicide attempters and 32 sex and age-matched controls on several personality characteristics including anhedonia rated by the PAS. The suicide attempters were interviewed 6–7 weeks after the suicide attempt. Suicide attempters had higher scores on the PAS than the control ($p = .01$). If this study the depression was not controlled although suicide attempters were more depressed than the controls.

Loas and Boyer [4] in a sample of 61 major depressed subjects reported significant correlation between the suicide item of the Hamilton depression rating scale and the total score of the revised Physical Anhedonia Scale (PAS).

Nock and Kazdin [5] have examined the role of affective factors in the occurrence of sucidal ideation, suicide attempts ad suicidal intent in 175 child and young adolescent aged from 6 to 13 years. The most frequent diagnosis was conduct disorder ($N = 85$). The authors used the Children's depression scale, the Scale for suicidal ideation, the Scale for suicidal intent for the rating of affective factors and risk of suicide, respectively. The Children's depression scale is divided into two subscales measuring depressed mood and anhedonia. Anhedonia subscale of the Children's depression scale was significantly correlated with the Scale for suicidal ideation, the Suicidal intent scale and current suicide attempt. After for controlling depressed mood the correlations remained significant except for the Suicidal intent scale.

Kelly et al. [6] have compared the psychiatric symptom of schizophrenic subjects who have died by suicide to those who have died by other means of death. The psychological autopsy method was used to assess the clinical characteristics of deceases subjects. Ninety-seven subjects were included in the study. The best informant was contacted within 6–12 weeks of the death. A semi-structured interview based upon the Structured Clinical Interview for diagnosis (SCID) was used. Using this interview and a review of all available medical records the Diagnostic evaluation after death was completed. Significant difference of anhedonia was found (20 % in the suicide group, 4 % in the non-suicide group). Significant higher rates of depressive and positive symptoms were also found in the suicide group comparatively to the non-suicide group in psychiatric subjects.

One study [7] has compared the initial characteristic of two groups of deceased schizophrenic subjects followed during 14 years. Among 150 schizophrenic patients followed during 14 years 8 patients deceased from suicide and 17 from other causes. The two groups were compared for clinical variables and scores on different rating scales. Suicide subjects had higher scores on the social withdrawal item of the BDI, measuring depressive anhedonia, than the scores of subjects deceased from other cause. Lower rates of "negative subjects" characterized suicide subjects and there was no significant difference of the total score of the PAS.

Agrawal et al. [8] in a genetic association study in large samples of healthy or heroin-dependent subjects have reported elevated rates (20.4 % for both samples) of suicide attempt in subjects presenting anhedonia and major depressive disorders comparatively with those with neither anhedonia nor major depressive disorder (0 and 1.4 %). Moreover in participants with anhedonia and without major depressive disorder the rates of suicide attempts were 8.4 and 8.3 %. In this study

anhedonia was rated using an ad hoc questionnaire measuring experience pleasure from daily activities for the last 1 or 2 weeks.

The seven preceding studies suggest only an association between anhedonia and risk of suicide and only prospective studies can test the relation of causality between anhedonia and risk of suicide.

One prospective study [9] in 954 psychiatric patients with major affective disorders found that anhedonia, rated by the SADS, was associated with suicide within 1 year.

One study [10] has suggested in a group of 46 depressed subjects that anhedonia, rated by the Physical and Social anhedonia scales, suicidal ideation and non-suppression in the dexamethasone test characterized a subgroup of 10 subjects. Moreover this subgroup was not identified with subgroups on any diagnosis from the DSM-III. The diagnoses according to DSM-III were major depression (n = 6) dysthymic disorder (n = 2) or atypical depression (n = 2).

11.3 Anhedonia and Low Risk of Suicide

Watson and Kucala in 1978 [11] have compared the score on the Watson anhedonia scale of 39 psychiatric subjects who later deceased by suicide, by natural causes or remained alive. Lower scores on the anhedonia scale characterized subjects who committed suicide comparatively with the scores of subjects who deceased by natural causes. Unfortunately, the authors did not mention the diagnoses of the psychiatric subjects.

A 19-year follow-up study [12] examined the relationships of symptoms, illness subtypes, and suicidal behaviors among patients with schizophrenia or schizophrenia spectrum disorders. Patients who later committed suicide had a significantly lower negative symptom severity at index admission than patients without suicidal behaviors. However, the paranoid schizophrenia subtype was associated with an elevated risk (12 %) and the deficit subtype according to Carpenter's criteria was associated with a lower risk of suicide (1.5 %). Taken into account that the deficit subtype is characterized by anhedonia [13] comparatively to the non-deficit subtype of schizophrenia, it could be suggested that low risk of suicide in deficit schizophrenia could be partly explained by anhedonia.

Two other studies in healthy subjects or parasuicide subjects have found no relationship between anhedonia and suicide.

In 224 healthy subjects the authors [14] did not found significant correlation between the current suicidal ideation item of the Beck depression inventory (BDI) and the PAS.

In a previous study [3] comparing anhedonia rated by the PAS in suicide attempters and controls the authors reported higher PAS scores in suicide attempters but the level of depression was not controlled. To take into account this limitation of the study a survey [15] has compared 73 depressed suicide attempters, 30 non-depressed suicide attempters and 104 sex and age-matched controls on the PAS. Depressed suicide attempters had significantly higher scores on the PAS than

controls and non-depressed suicide attempters. There was no significant difference between non-depressed suicide attempters and controls. This study suggests that anhedonia was a symptom of depression in suicide attempters and not a stable trait. The sample of the 106 suicide attempters was followed during 6.5 years [16].

6.7 % of the suicide attempters deceased by suicide during the follow-up. Cox regression analyses revealed that high proportion of men and low anhedonia were associated with decrease of the survival time. There was not effect of depression as assessed by the BDI.

One study [17] has tested the hypothesis that physical anhedonia could be an endophenotype in bipolar affective disorder. Using the cutoff score of the PAS the authors assigned euthymic bipolar patients to anhedonic or hedonic subgoups. The two groups did not differ on personal history of suicide attempt (violent or not).

11.4 How to Explain the Discrepancy of the Literature?

Firstly, the role of anhedonia in the risk of suicide is related to different characteristics of this dimension. The characteristics that must be into account are the level of anhedonia (severe or not severe), the stability of anhedonia (acute or stable dimension) and the measure used.

Concerning the measures the authors used either non specific rating scales or specific rating scales. The Social and Physical Chapman scales rates trait-anhedonia although non specific rating scales (e.g. SADS, ad hoc questionnaire) rates rather state and depressive anhedonia.

When anhedonia is severe and constitutes a state and notably a depressive symptom then anhedonia is a risk factor of suicide. Fawcett et al. [18] have proposed four hypothetical pathways leading to suicide in clinical depression. Among the four pathways the authors distinguished severe anhedonia that characterized only 15 % of subjects hospitalized for major depression [18] and was associated with suicide within 1 year [19].

It is interesting to note that anhedonia as a depressive symptom is also associated with the risk of death whatever the causes in older persons or in medical patients as suggested by two prospective studies [19, 20].

When anhedonia is not related to depression and constitute a trait then anhedonia is either unrelated to risk of suicide or associated with a low risk of suicide.

In other words acute anhedonia notably related to depression could be a short-term risk factor of suicide although chronic anhedonia could be either non-related to the suicide risk or even could be a long-term protective factor of suicide.

When anhedonia is chronic the subjects become less sensitive to pleasure of the life and thus are less sensitive to frustrations when the search of pleasure is not satisfied.

Secondly, the distinction between consummatory and anticipatory anhedonia [21] is not taken into account although these two anhedonias could play different role in the risk of suicide.

Klein [22] has suggested that deficit in consummatory pleasure could characterize endogenomorphic depression, a subtype of depression associated with elevated risk of suicide.

Specific rating scales measuring anticipatory and consummatory are now available [21] but unfortunately any study has explored the link between these anhedonia and the risk of suicide.

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