11 Suicide and Schizophrenia: Factors Affecting Recovery

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Introduction

Schizophrenia is a complex neuropsychiatric disorder which has multiple domains of symptomatology that span from affective to cognitive and has a long, drawn-out course and outcome [1]. Many patients with schizophrenia may die unnaturally and early due to various causes. Suicide is a common cause of death in schizophrenia. It has been noted that 20–30% of patients suffering from schizophrenia may attempt suicide and 10% successfully complete it [2]. There are multiple factors that herald the onset and affect the occurrence of suicide in schizophrenia. Suicide attempts and suicidal behavior are known to affect the course of schizophrenia and also affect the outcome and recovery from the disorder. The course and prognosis of the disorder are directly proportional to suicidal behavior that may be seen in the patient, and this behavior also determines the treatment patterns that may be used in the long-term management of the disorder [3]. The current chapter looks at suicide in schizophrenia from the point of view of how suicide and suicidal behavior may affect recovery from schizophrenia.

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Suicide and Recovery from Schizophrenia

Suicide and schizophrenia are closely related to each other. A high number of people who attempt or commit suicide suffer from schizophrenia, and a high number of patients suffering from schizophrenia exhibit suicidal behavior. Suicide and suicidal behavior are observed throughout the course of schizophrenia and seen in the prodromal stage, during acute phase of remission, in residual phase, in chronic schizophrenia, and even after recovery during reintegration into society [4]. It may also be a symptom that marks relapse. A number of times, patients with schizophrenia show an improvement in positive symptoms, while negative symptoms and suicidal behavior persist [5]. Many patients with schizophrenia actually get hospitalized post a suicide attempt. Repeated suicide attempts in patients with schizophrenia are always two to three times more than initially, and the severity of the attempt also may be greater [6]. There is a strong interplay of factors that affect recovery from schizophrenia and affect suicidal behavior in patients with schizophrenia.

Many patients in the West seek treatment for schizophrenia early due to health insurance, unlike in Asia where it may be hidden due to stigma, leading to many patients being ill for years and treatment being sought only after a severe suicide attempt. Suicide in schizophrenia

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is a part of the illness but is not often considered as an outcome criterion [7]. Outcome of any illness is measured on parameters of clinical remission, quality of recovery, level of functioning, quality of life, rehospitalization, impact on key relationships, economic cost and utilization of health system, global burden of disease, and loss of productivity. Suicidal behavior correlates with the clinical and social outcome to a consistent and proportionate degree. Whenever schizophrenia has poor outcome, suicide behavior also recovers poorly and vice versa [8].

It is generally accepted that we are yet far away from finding out accurate measures of deciding the level of recovery in schizophrenia. Many patients are hospitalized due to a suicidal attempt or crisis. Prevalence of suicide behavior is two to three times higher in comorbid disorders (where more than two or three mental disorders coexist), for example, schizophrenia with depressive and obsessive compulsive features and schizophrenia with substance abuse [9]. It is important to understand that while suicide is a part of the disorder in schizophrenia being a symptom, it is also on its own an independent psychopathological construct that affects the outcome and recovery from many psychiatric disorders [10]. Stigma in schizophrenia also increases once the patient attempts suicide, and this fact is known to people in the patient's family and those around him [11]. We must include suicidal behavior in the list of factors that affect recovery from schizophrenia to have a better understanding of how it affects functioning, quality of life, chances of rehospitalization, and rate of mortality [12].

Suicidal behavior contributes significantly as "all causes of death" in schizophrenia. Since suicidal ideation is a strong predictor of attempted/completed suicide, an accurate identification of suicidal ideation may help prevent these attempts. This may finally prove to be lifesaving and improve recovery from schizophrenia. Since suicide is responsible for a large number of rehospitalizations in schizophrenia, by keeping suicide in recovery and outcome criteria, a better assessment and probability of relapse will be estimated. It is not clear whether persistent ideas of suicide or risk of suicide contributes to poor social function. By identifying suicide behavior as a predictor of outcome (good or bad), level of recovery can be increased by providing appropriate treatment for risk of suicide [13].

In the last 15 years in schizophrenia research, there has been a strong focus in conceptualizing response, remission, and recovery in order to better understand the influence of schizophrenia on the overall life of a person. During this period, research has come out with significant conclusions. Sophisticated predictors have been defined, outcome is multidimensional, and by clearer understanding of outcome status, a better understanding has been sought about how an illness progresses and originates. It is imperative that suicide and suicidal behavior be considered as one of the predictors of the same [14].

Factors That Affect Suicide in Schizophrenia

There have been multiple studies that have looked at various facets of schizophrenia and suicide as well as suicidal behavior related to it. The current section shall look at the various factors that interplay in the occurrence of suicide in schizophrenia and how suicide thus becomes an important parameter in recovery from schizophrenia.

When Is Suicide Risk Highest in Patients with Schizophrenia?

The risk for suicide in patients suffering from schizophrenia is considered to be highest in the early course of the illness and usually within the first year of illness [15]. The same may be said of patients with first-episode psychosis. In fact, patients with first-episode psychosis have higher estimates of mortality from suicide than studies with longer periods of follow-up in patients with schizophrenia. Suicide has been noted in our clinical experience in all phases of schizophrenia. There is the acute phase where suicide and suicidal behavior occur in the context of psychosis and command hallucination that may prompt the patient to end his life. Suicide also occurs in chronic untreated patients when they act upon their symptoms. There is also a chance of

depression setting in the post-psychotic phase where the patient realizes that he has been through an episode of psychosis. The stigma of psychosis and recovery from it while trying to return to normalcy may prompt the patient to end his life, as he may not be able to cope with the fact that psychosis has in fact happened. Negative symptoms in schizophrenia may have depressive variants, and these may induce suicidal ideation and behavior as a part of the symptom makeup. Most studies of suicide in schizophrenia have been retrospective in nature, and there is a need for prospective data [16].

Suicide and Demographic Factors of the Patient in Schizophrenia

The age of the patient and the age of onset are very important factors in recovery for schizophrenia. There has always been a debate about whether younger-onset patients versus later-onset patients show differences in recovery. It has been shown that late-onset schizophrenia after the age of 35 has poorer prognosis [17]. Educational level is another factor that plays a role in recovery. However, educated patients think more and tend to develop depressive features far more than non-educated subjects and increase their risk for suicide and suicidal behavior [18]. Younger subjects below the age of 30 and older subjects above the age of 45 are more prone to suicidal behavior in schizophrenia. Presence of severe hallucinations is another determinant of suicidal behavior in schizophrenia. Marriage and sound social support with good family environments serves as a protective factor from suicide in schizophrenia [19]. Patients with good insight are more likely to develop affective features and are more prone to suicide as well.

Suicide and Hospitalization in Schizophrenia

The suicide risk in schizophrenia is especially high in relation to hospitalization, which stresses the importance in clinical practice of paying extra attention during all phases of the illness. It has been reported in literature that 33–35% of suicides among patients with schizophrenia occur during admission or within 1 week after discharge from the hospital [20]. There is a peak of suicide risk during these periods, and there is a need for an immediate assessment of suicide risk after admission and proper follow-up and outpatient treatment immediately after discharge from the hospital. The suicide risk for schizophrenia was relatively constant during the first year following discharge. The total number of psychiatric admissions and duration of hospitalization has also been associated with a higher risk of suicide and is a measure of the severity of the illness [21].

There has been a study linking the relationship between post-discharge suicide in schizophrenia and the age and gender of the treating psychiatrist, stressing the need for quality care and assessment among mental health professionals. There has been a decline in inpatient psychiatric care in the last decades, with the advent of better medications and early treatment. These changes have been proposed to be a cause of the rising mortality seen in patients with schizophrenia, as outpatient treatment is not as effective as inpatient care in many cases [22].

Suicide Attempts in Patients with Schizophrenia

A history of deliberate self-harm or suicide attempt and the presence of active suicidal ideation are the strongest risk factors for suicide in patients with schizophrenia. A history of attempted suicide significantly increases the risk of suicide among patients with schizophrenia and is the single most commonly reported clinical risk factor for suicide. It is well known that schizophrenia as an illness influences the overall risk and temporality for completed suicide [23]. More male patients with schizophrenia may attempt suicide, while more female patients attempt it. The estimates of attempted suicide range from 15% to 40% in schizophrenia. Many patients may use methods which are far more violent and lethal than when compared to patients with depression [24].

Depression is an important risk factor for attempted suicide in schizophrenia. Depression affects recovery in schizophrenia as well. Depression may be seen as symptom of the illness, as a part of negative symptoms; it may

also been in the recovery phase as a part of post-psychotic depression and may be seen sometimes as an antipsychotic-induced depression when typical antipsychotics are used. Studies have shown that past or recent suicide ideation, previous deliberate self-harm, past depressive episodes, and a higher mean number of psychiatric admissions increase the risk of suicide in schizophrenia. This is coupled with suicidal ideation of a past and recent nature [25].

Suicide, Substance Abuse, and Recovery from Schizophrenia

Substance abuse has been associated with impulsiveness and suicidal behavior as a disorder, and it increases when the substance abuse is present in a patient with schizophrenia. Alcohol dependence is a common disorder—along with nicotine dependence—seen in schizophrenia, and this is often used by the patient to cope with the distressing symptoms associated with the disorder [26]. Cannabis is another commonly abused drug among patients with schizophrenia and more so seen in patients with first-episode schizophrenia, and the age of onset of schizophrenia appears to be lower among cannabis abusers compared with both cannabis non-abusers and alcohol abusers [27]. Presence of substance abuse in schizophrenia leads to noncompliance with medication, irregular follow-up, violence and aggression, depression, and suicide risk, along with financial difficulties. Cannabis use has been reported as a risk factor for nonadherence to medication and to treatment dropouts [28]. There have, however, been no differences in symptom profiles of psychosis between patients who abuse and do not abuse cannabis. Patients with schizophrenia who had substance abuse spent more days in the hospital, reported higher anxiety and depression levels, and were more likely to indulge in aggression or hostile behavior or crime [29].

Biomarkers of Suicide in Schizophrenia

Multiple studies have looked at various blood parameters at an attempt to elucidate viable blood biomarkers that may serve as indicators of suicidal behavior in schizophrenia and first-episode psychosis. Low levels of cholesterol have been described in suicide behavior, including among those individuals who have an increased tendency for impulsivity. Violent suicide-attempt patients show significantly lower cholesterol levels than those with nonviolent suicide attempts [30]. In a study of 60 patients with suicide attempts and schizophrenia, lower cholesterol levels were correlated with severe suicidal behavior and female patients [31].

Thyroid hormones have been implicated in both depression and suicide. Elevated and normal total T4 levels are seen in drug-naive patients with acute psychotic episodes, and these levels are known to normalize or decrease in response to treatment with different drugs. A positive correlation between circulating free T4 and free T3 with the severity of schizophrenia has been reported across studies. In a study of 60 cases of first-episode psychosis, a higher level of TSH and an inverse correlation with suicide potential in patients suffering from schizophrenia were noted. There is a high suicide risk and possibility of hypothyroid states in these patients. The study argued that careful screening for suicide in patients with schizophrenia was a must along with estimation of TSH levels [32].

Brain-derived neurotrophic factor (BDNF) has gained the most attention in suicide research, and several studies consistently show that expression of BDNF is reduced in blood cells of suicidal patients and in brains of subjects who have committed suicide. A large number of studies have shown an evidence of the role of BDNF in suicide, and a strong association of suicidal behavior with BDNF functional polymorphism has been noted. Reports indicating lower levels of BDNF in subjects suffering from schizophrenia with suicide attempts suggest that serum BDNF levels may be a potential marker of suicidal behavior in schizophrenia. Literature reviews indicate that abnormalities in neurotrophic expression in schizophrenia exist. BDNF reductions have been noted in the early phase of the disorder and improve as the disorder improves. BDNF is a survival factor for CNS neurons, and a deficit in the production and utilization of BDNF leads to neuronal integrity and synaptic dysfunction

in schizophrenia. This may have implications for suicide in schizophrenia as well [33, 34].

Many other studies have looked at parameters like neutrophil-lymphocyte ratio (NLR) [35], C-reactive protein [36], and serum testosterone levels [37] but have remained inconclusive.

Neuroimaging and Suicide in Schizophrenia

Magnetic resonance imaging studies have shown differences between prodromal patients who convert to schizophrenia or psychosis and those who do not, based on the fact that converters have less gray matter in the cerebral cortex, and magnetic resonance spectroscopy studies have shown changes in different brain metabolites in these patients, but no studies specific to suicide in schizophrenia have been conducted [38]. It is established that the early stage of schizophrenia is associated with progressive changes in brain structure and function, and there is a need to investigate the "transition" to psychosis from an "at-risk" stage using functional brain imaging [39]. Structural brain changes have been noted in the prodromal phase as well as in first-episode psychosis within drug-naive and drug-medicated patients. These brain changes have been implicated clinically in symptoms like impaired cognitive control of mood, pessimism, reactive aggressive traits, impaired problem-solving, over-reactivity to negative social signs, excessive emotional pain, and suicidal ideation, finally leading to suicidal behavior [40].

Hypothesis for Suicide as an Important Factor in Recovery from Schizophrenia

Suicide is an important factor in the recovery of patients from schizophrenia, as there are biopsychosocial implications of suicide in schizophrenia. Some of the reasons why it is an important factor are as follows:

Suicide attempts have devastating effects on both the patient and the caregivers. The recovery from a suicide attempts adds to the recovery period from schizophrenia, and this adds to days of hospitalization and also increases the chances of rehospitalization. This is so because suicide attempts may very often be forerunners of future attempts and rehospitalization [41].

Suicide attempts may also serve as an indicator that there are a preponderance of depressive features and negative symptoms. This increases the number of add-on medications, and thus compliance may be affected, leading to relapse and impaired recovery [42].

Suicide attempts also affect a patient from a neurobiological perspective. Depletion of positive neurotransmitters and protective neurotrophic factors has been reported in schizophrenia. This worsens in the wake of suicide, and thus makes the patient weaker biologically, thereby preventing full recovery [43].

Suicide attempts may also impair cognition and recovery from a neuropsychological perspective, as many neurocognitive parameters are known to be impaired in suicide [44].

The increased days of hospitalization may cause loss of employment and income and impair treatment compliance and follow-up, causing impairments in the recovery process [45].

The stigma associated with schizophrenia increases when there is a suicide attempt, and this, too, adds to the burden during recovery [46].

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