



IMPULSIVITY IN SUICIDE ATTEMPTERS: A CROSS-SECTIONAL STUDY IN A TERTIARY CARE CENTRE IN KERALA

Medical Science

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ABSTRACT

Background And Objectives: Worldwide, suicide is one among the leading causes of premature mortality. Suicidal attempt is a well known risk factor for completed suicide. Impulsivity is a factor that is accepted as a good endophenotype in suicidal behaviour. Aim of this study was to study the prevalence of impulsivity in suicide attempters.

Methods: This study was a cross-sectional observational study conducted in a Medical College in Kerala from March 2015 to December 2015. 125 patients who came with suicide attempt were studied using BIS scale-11 for impulsivity. Statistical analysis of the data was done using SPSS software.

Results And Discussion: In this study, impulsivity was found in 68% of suicide attempters. Impulsivity was greater in the unmarried suicidal attempters, those with higher educational status, younger patients and those without psychiatric illness. Impulsivity was more in adjustment disorder, substance dependence, bipolar affective disorder and less in psychotic and depressed patients who attempted suicide. Impulsivity was also related to mode of suicide attempt.

Conclusion: This study showed high prevalence of impulsivity in suicidal attempters. More studies in this area can definitely help to understand and prevent this tragic health problem.

KEYWORDS

Impulsivity; suicide attempters; BIS-11;

INTRODUCTION:

Suicide is a social and health issue of prime importance as it is one of the leading causes of premature mortality around the world. The complex and multifaceted nature of suicide has an effect on our understanding of this tragic health issue. Rate of suicide in Kerala has been markedly increasing over the years. A study by CR Soman et al showed that suicide ratio was 44.7/100000 in males and 26.8/100000 in females in Kerala, male:female ratio being 1.7⁽¹⁾.

Suicidal attempt is a self injurious action without a fatal outcome for which there is evidence that the individual had intention of killing oneself. Suicidal attempt is a well known risk factor for completed suicide. Studies report that after one year of a suicidal attempt, there is about 15 % risk of repetition. Compared to the general population, the risk of suicide is hundred times greater in suicidal attempters⁽²⁾.

Impulsivity can be described as rapid unplanned reactions to internal or external stimuli, without regard to the negative consequences of these actions to oneself or others. There is growing evidence to suggest that impulsivity is accepted as a good endophenotype in suicidal behaviour⁽³⁾. According to a study by Chiho Doihara et al from Japan, in suicide attempters, impulsivity is an important aspect of such behaviour⁽⁴⁾. BIS-11 total score is an internally consistent measure of impulsiveness and has clinical utility for measuring it⁽⁵⁾.

An investigation of those who attempt suicide would yield information important for improving prevention and follow up treatment of this tragic and preventable public health problem.

AIMS AND OBJECTIVES:

To study the prevalence of impulsivity in suicide attempters and to study the relation of impulsivity with other variables.

Suicide is a conscious, fatal act of self-harm made with self-destructive intent. Suicidal behaviour ranges from suicidal ideation to suicide attempts and completed suicide. Historically, Émile Durkheim had divided them into egoistic, anomic and altruistic types. Egoists were lonely, withdrawn people who were not adequately integrated into their environments. The anomic ones were affected by life-circumstance changes (e.g., loss of love or loss of job). The altruistic ones died for a cause (e.g., the soldier who dies in order to save his comrades). Though forbidden by almost all religions, suicide increased over the years.

In the past few decades, suicide rates have increased by 60% in some countries. It is reported that, between 1987 and 2007, the rate of suicide increased from 7.9 to 10.3 per lakh, higher suicide rates were noted in

southern and eastern states of India⁽⁶⁾.

Various individual and social factors contribute to suicide. Attempted suicide is a very strong risk factor for completed suicide^(7,8,9). Risk of repeated attempt is highest in the first year after an attempt, particularly in the first 3 to 6 months^(10,11).

Research has shown a global and stable form of negative anticipations and absence of positive anticipations towards the future, in suicide attempters. Neurochemically, serotonin-system dysfunction is associated with suicide. Neurons of serotonin have cell bodies in the dorsal raphe nucleus and their axons innervates ventral prefrontal cortex and other areas of brain. The reductions in serotonin or 5-HIAA are related to the suicide⁽¹²⁾. With regard to noradrenergic system, there is an increase in tyrosine hydroxylase despite the reduction in cell number. This indicates a highly active system depleting noradrenaline and accelerated biosynthesis.

It is possible to reduce suicide mortality through brief, low-cost interventions as revealed by World Health Organization's (WHO's) suicide prevention multisite intervention study on suicidal behaviours (SUPRE-MISS).

Impulsivity is a multifactorial variable. It describes a tendency to act on a whim, displaying behaviour without forethought or consideration of the consequences. Actions taken impulsively are conceived poorly, expressed prematurely, unduly risky, or situation inappropriate and result in undesirable consequences, which destroys long-term goals. Impulsivity is seen in ADHD, substance use disorders, bipolar disorder, antisocial personality disorder and emotionally unstable personality disorder. Abnormal impulsivity is also noted in brain injury and neurodegenerative diseases. Studies have found that impulsive behaviour are associated with specific brain areas^(13,14). Various brain networks may also contribute to different manifestations of impulsivity⁽¹⁵⁾. Genetics have a role to play too⁽¹⁶⁾.

Impulsivity is important in the etiology and also prediction of suicide. Some studies have shown that inadequate control of aggressive impulses is a better indicator of the risk for impulsive suicide attempts than depression⁽¹⁷⁾. Impulsivity has its own role in facilitating suicide among those with suicidal ideation. Mann and colleagues⁽¹⁸⁾ mentions a clinical model of suicide which says that impulsive individuals are more likely to act on suicidal feelings. Similarly, Bryan and Rudd⁽¹⁹⁾ mentions that when we compare impulsivity and the presence of a suicide plan, impulsivity is a more significant indicator of suicide attempt. The American Association of Suicidology mentions impulsivity as a chronic and an acute suicidal risk factor. Impulsivity is

highlighted by the Substance Abuse and Mental Health Services Administration and also by the American Foundation for Suicide Prevention. Links between impulsive personality and suicidal behaviour has been consistently noted in studies^(20,21,22,23). Dougherty and colleagues⁽²⁴⁾ found that higher impulsivity had an association with more suicide attempts. Simon et al.(2001) studied 153 suicide attempters and reported that 24% among them attempted impulsively⁽²⁵⁾.

Although impulsivity is a significant risk factor for suicide, a mechanism for their relationship is not very clear. All impulsive individuals don't die by suicide, all those who attempt suicide won't be impulsive too. In early theories of suicidal behaviour, impulsivity experienced at a particular point in time was thought to have an association with sudden, unplanned suicide. Joiner's (2005) interpersonal-psychological theory mentions that impulsivity at the time of self-harm is less important when compared to impulsivity exhibited throughout life. It has conceptualized impulsivity to be a *trait* that influences involvement in risky behaviours like substance use, rash driving, fighting. According to this, impulsive people don't die on a whim due to state impulsivity. Rather, they engage in experiences or risky behaviours over the years, that makes them capable to enact serious self-harm.

Research indicates that impulsive people are more prone to accidents and substance use⁽²⁶⁾. Painful and provocative experiences like injuries and substance use, create familiarity with potentially life-threatening situations and pain, thereby making them vulnerable to self-harm. Baca-Garcia and colleagues⁽²⁷⁾ had assessed state impulsivity and trait impulsivity simultaneously. They saw that impulsive traits didn't predict state impulsivity and noted that non-impulsive attempts were more lethal than impulsive attempts^(27,28). Wyder & De Leo⁽²⁹⁾ has reported that only a quarter of those who reported a past suicide attempt were impulsive in their action. Trait impulsivity was similar among impulsive and non-impulsive attempters.

Witte et al.⁽³⁰⁾ had studied suicidal adolescents as three groups. First group included those who planned suicide, but did not attempt; second group he included those who did not plan, but did attempt; and third group included those who planned for and attempted suicide. The second group were *less* likely to engage in other impulsive behaviours than those in third group. Those who made planned suicide attempts mostly required medical attention for their injuries. Less than 10%, who had attempted suicide in their sample had done so impulsively.

According to a study by Alan C. Swann, Donald M. Dougherty and colleagues⁽³¹⁾, those having a history of suicide attempts were noted to make more impulsive errors on the immediate memory task. They reportedly also had shorter response latencies, mainly for impulsive responses. Impulsivity was reported to be highest with more lethal attempts. Mood disorder at the time of testing did not explain these effects. Barratt Impulsiveness Scale scores were larger in people with suicide attempts, but it was not significant in their study. Harmful use of alcohol was reportedly associated with greater probability of suicide.

Further research in this area will definitely help to predict and prevent suicide which is a tragic health issue.

METHODOLOGY

Venue: The study was conducted in The Department of Psychiatry, Government Medical College, Calicut. **Study Design:** Cross-sectional Observational study. **Study Period:** 10 months from March 2015 to December 2015.

Sample size: A minimum of 120 subjects (based on previous study by Chiho Doihara et al⁽⁴⁾), with help of formula $4SD^2/d^2$, 'SD' being standard deviation and 'd' precision, 'SD' was 11 and 'd' was taken as 2) were needed. The study had 125 subjects. **Subjects:** Patients fulfilling the inclusion and exclusion criteria.

Inclusion Criteria:

1) Age 18-60 years. 2) Admitted with suicidal attempt in Government Medical College, Kozhikode. 3) Given informed consent to participate in the study.

Exclusion Criteria:

1) Patients non co-operative/who didn't consent for the study. 2) Poor physical condition interfering with formal assessment of mental status.

Assessment Tools

1. A Semi structured proforma to collect the details of socio-demographic profile. 2. Barratt Impulsivity Scale to assess trait impulsivity.

Barratt Impulsivity Scale is a self administered 30 question scale. It helps to identify and quantify impulse-control disorder or pathological impulsivity in a person. Each question is scored out of four points. It assess how a person thinks and behaves without reference to a specific point in time. The questionnaire has three subscales - motor, non-planning and attentional. Attentional impulsiveness assess thought insertions, the task at hand and racing thoughts. Motor impulsiveness notes acting on the spur of the moment and perseverance. Non-planning impulsiveness assess enjoyment of challenging mental tasks, planning and thinking carefully. The validity and also the reliability of BIS-11 is well established. Stanford et al suggested high impulsivity when BIS-11 score is more than 72⁽³²⁾.

PROCEDURE

Every patient coming with attempted suicide in Medical College, Kozhikode and admitted in various departments, will be sent for psychiatry consultation and entered in DSH register maintained in the department. Every third person in the register fulfilling the inclusion and exclusion criteria was a part of the study. After collecting details of the socio-demographic profile using the proforma, impulsivity was compared among the suicidal attempters using Barratt Impulsivity Scale. All the patients were examined in detail regarding the history, mental status, physical status- the presence or absence of psychiatric illness were assessed. The final diagnosis was made based on ICD10-Diagnostic Criteria for Research and again confirmed by two senior psychiatrists. Degree of association between the variables was found out using chi square test. Data analysis was carried out using Statistical Package for Social Sciences (SPSS).

DISCUSSION

125 patients who came with suicidal attempt and fulfilling inclusion criteria were part of the study. Patients fulfilling exclusion criteria, as defined above, were excluded from the study.

In the study there were 48 males (38%) and 77 females (62%). Of the 125 patients, 68 (54.4%) were less than 30 years of age, 22 (17.6%) were in 30-39 age group, 21 (16.8%) in 40-49 age group and 14 (11.2%) patients were more than 50 years of age. 52 patients (41.6%) were married, 54 (43.2%) unmarried, 10 (8%) were separated, and 9 (7.2%) were widow/widower. 54 patients (43.2%) out of 125 had a family history of suicide.

Assessment of impulsivity (when assessed with a cut off score of 72 in BIS) showed that 85 (68%) of the patients were impulsive, while 40 (32%) were not. In a study by Hana Zouk et al, where impulsivity was characterised in suicide completors, it was found that around when a BIS score cut off 75 was used 30% were impulsive⁽³³⁾. Whether there is impulsivity difference among suicide attempters and those who complete suicide has scope for further research.

102 patients (81.6%) of the 125 had some psychiatric illness. Of these, 42 patients were found to have depressive episode/RDD. The other diagnosis included adjustment disorder, psychotic illness (F20-F29), substance dependence, bipolar disorder, obsessive compulsive disorder, personality disorder, and mixed anxiety depressive disorder. This finding of high prevalence of psychiatric illness in suicide attempters is similar to previous studies, which include a study by Andrew T. A. Cheng⁽³⁴⁾. Another study by Beautrais AL, Joyce PR, Mulder RT⁽³⁵⁾ also showed high rates of psychiatric disorder in suicide attempters (89.5%). Similar to the findings of this study, the common disorders were mood disorders and substance dependence.

When impulsivity was compared between different marriage groups, data showed that 44 (81.5%) of the 54 unmarried patients were impulsive, 34 (65.4%) of 52 married patients were impulsive, 4 (40%) of 10 separated patients were impulsive and only 3 (33.3%) of 9 widow/widower were impulsive. Impulsivity was found to be greater in the unmarried group and the data was statistically significant with a p value 0.004. This finding is similar to a finding of a study by Mirae Lim et al. where it was found that compared to the non impulsive attempters, impulsive attempters were more likely to be unmarried.⁽³⁶⁾

When impulsivity was compared with educational status of patients in

the current study, it was seen that, the proportion of impulsive persons increases compared to nonimpulsive persons as the educational status increases among suicide attempters. Among patients who had studied till primary school, 15 (45.5%) of 33 patients were impulsive while in the patients who had studied above plus two, 10 (83.3%) of 12 patients were impulsive. This showed that there was a greater trend to impulsivity with better educational status. The data was statistically significant (p value 0.013). However, the study was in suicide attempters. Whether there is a greater impulsivity with better educational status in the general population requires further studies.

Impulsivity was compared among patients with and without psychiatric illness. It was noted that impulsivity is more common in suicide attempters without any psychiatric illness compared to those with psychiatric illness and the same was statistically significant (p value 0.000). Of the total 125 patients, 23 (18.4%) did not have any psychiatric illness. It was noted that all these 23 (100%) patients were impulsive. In the present study it was seen that, in patients with psychiatric illness, impulsivity score is more in patients with adjustment disorder, substance dependence and also in bipolar affective disorder. Of the 19 patients with adjustment disorder, 16 (84.2%) were impulsive. 12 (92.3%) of 13 patients with substance dependence were impulsive and 8 (80%) among the 10 bipolar patients were impulsive. Impulsivity was less among patients with psychotic illness and depression. Only 4 (30.8%) among the 13 psychotic patients were impulsive and only 19 (45.2%) of 42 depressed patients were impulsive. The finding of high impulsivity in substance use disorders and bipolar affective disorder is well documented in previous research (37).

In the study, there was a statistically significant relationship between impulsivity and mode of suicidal attempt (p value 0.01). Among the 24 patients who attempted suicide by hanging, 22 (91.67%) were impulsive. 18 (78.3%) of 23 patients who attempted suicide by wrist slash were impulsive. Among the 75 who attempted suicide by poisoning, 45 (60%) were impulsive. In a study by Diego De Leo, Russell Evans and Kerryn Neulinger, they have suggested a possible relationship between impulsive traits and the choice of method of suicide (38).

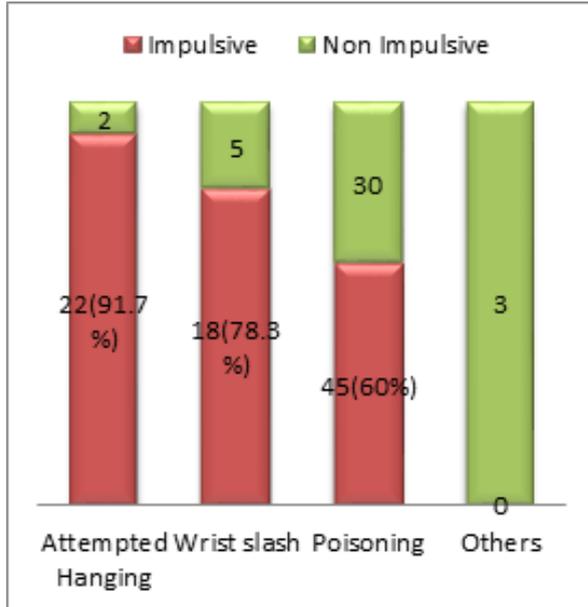


Figure 1: Impulsivity And Mode Of Suicide Attempt (p=0.001)

It was noted that impulsivity was high among younger suicide attempters compared to older patients. Among patients less than 30 years of age, 54 of 68 (79.4%) were impulsive, while patients more than 50 years, 5 of 14 (35.7%) only were impulsive. This relationship was statistically significant with a p value of 0.003. A study by A. McGirr et al had showed an association between higher level of impulsivity and younger age of death by suicide (39).

Impulsivity distribution among gender in the present study showed that 32 (66.6%) of 48 males and 53 (68.8%) of 77 females who attempted suicide were impulsive, however the result was not

statistically significant. Data from the study also showed that impulsivity is more in patients of lower economic status. The association was not statistically significant (p value 0.174). Similarly, the association between impulsivity and occupational status, and the observation that impulsivity is more in urban patients, were not significant, the p value being 0.661 and 0.061 respectively. In the current study impulsivity was less common in patients with a previous history of suicide attempt. This finding contradicts the earlier study by D.M. Dougherty et al, which noted an increase in number of suicide attempts with increased impulsivity (24). However, the finding was not statistically significant (p value 0.151).

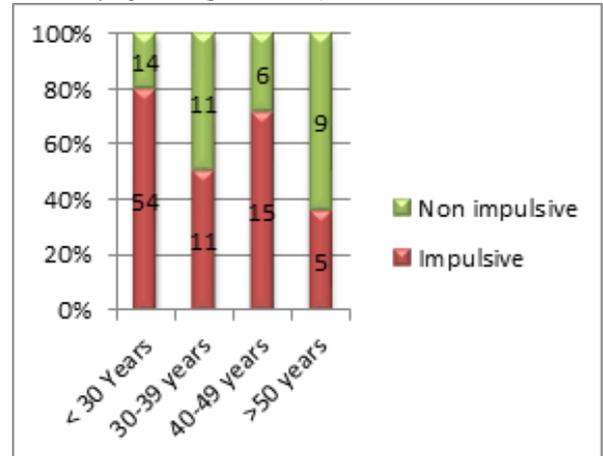


Figure 2: Proportion Of Impusivity Among Different Age Groups (p=0.003)

To conclude, this is an observational study to throw light on the role of impulsivity in suicidal attempts. More studies in this area can definitely help to understand and prevent this tragic health problem.

LIMITATIONS

Patient's psychiatric illness may have influenced the impulsivity scoring. In this study, trait impulsivity was studied, but the state impulsivity was not. As there were not many similar studies done in suicide attempters, comparison of observations with previous literature was not possible for some of the findings. Being an observational study, only the association between various factors and suicidal attempt could be studied, not the definite causation.

CONCLUSIONS

Impulsivity is definitely factor that contributes to suicide. This fact may be utilized in prevention and intervention strategies.

Psychiatric illness is noted to be highly prevalent in suicidal attempters. Hence aggressive screening should be done in such patients to prevent recurrence.

Impulsivity was found to be greater in the unmarried suicidal attempters compared to married suicidal attempters.

The proportion of impulsive people compared to nonimpulsive people increases as the educational status increases, among suicide attempters.

Impulsivity was more common in suicide attempters without any psychiatric illness compared to those with psychiatric illness.

In suicide attempters with psychiatric illness, impulsivity was more noted in patients with a diagnosis of adjustment disorder, substance dependence and also in bipolar affective disorder. Impulsivity was less among patients with psychotic illness and depression.

There was a statistically significant relationship between impulsivity and mode of suicidal attempt.

Impulsivity was less among older people compared to younger suicidal attempters.

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