Author's response to reviews

Title: Psychiatric disorders and clinical correlates of suicidal patients admitted to a psychiatric hospital in Tokyo

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Author's response to reviews: see over
Dear Prof. Morten Hesse,

We present herewith the manuscript revised on the basis of your recommendation dated on 9 Nov 2010: to indicate the source of the classification of suicidal behavior and to reconsider the use of Bonferroni correction (or to improve the presentation of the correction).

The following corrections have been made in the new manuscript.

1. The source of the checklist, on the basis of which we made the classification of suicidal behavior (SB), has been presented.
2. Every corrected significance level according to Bonferroni’s method has been presented so as to indicate the range of family variables that were included in the repetitive statistical tests and subjected to the correction.

We have discussed over which to be chosen, an application of a 0.01 or a 0.005 significance level for the entire analysis, or the use of Bonferroni correction for each of the variable families. The decision has been made on the basis of the opinion of Dr Ishii, a statistician of our study group, who attaches greater importance to the latter case-specified analysis than succinctness and explicitness of the former.

Point-by-point corrections are listed below. The corrected parts are indicated in red letters.

1. The source of the list of SB types and a description of a subsequent inquiring procedure are added.

Correction 1 (Pp. 6-7)

“(1) Suicidal Behaviors
Types of SBs immediately prior to admission and the frequency and period of SBs in the lifetime history of the subjects were recorded. The list of SB types was made on the basis of that of suicide attempts used by Hosaka, et al. in the report of the 2004-2006 Japanese Ministry of Health, Labor and Welfare aided research. Beside the 5 SBs shown in Table 2, gas-poisoning, self-immolation, self-drowning or submersion, self-electrocution, gunshot, self-burning, self-stabbing, self-banging, self-dissection, self-biting, and self-scratching were individually inquired in the first stage of assessment. The next stage was asking the period and the frequency of their occurrence in the lifetime history.”

2. Descriptions indicating the variable families subjected to Bonferroni correction are inserted in addition to the same-content descriptions in the note of Table 2, 3 and 4 that have already been placed in the previous manuscript.

Correction 2-1 (p. 10)

The following sentence is inserted in p. 10 in the manuscript.

“The following associations of SBs with gender and age were found in the analyses where a significance level of 0.01 (0.05/5) was applied since statistical tests were conducted for each of the 5 SB methods shown in Table 2.”

Correction 2-2 (p. 11)

“6 DSM-IV axis I disorder groups and 10 axis II PDs of the subjects are exhibited in
Tables 3 and 4. ... It was found in the analysis that applied a significance level of 0.0083 (0.05/6) that subjects with anxiety disorders were younger than those without them (medians, ranges of the age: 32, 20-72 and 36, 21-76, respectively...... The analysis that applied a significance level of 0.005 (0.05/10) indicated that PDs, patients with which were younger than those without that PD were borderline PD and antisocial PD.”

Correction 2-3 (p. 11)
“The proportions of the subjects who reported each of 3 domains of RLEs and LPs were ........ The following associations were found in the analysis that applied a significance level of 0.0167 (0.05/3).”

Correction 2-4 (p. 12)
The averages (SDs) of the 3 OAS-M domain scores: aggression, irritability, and medical lethality scores ...... The analysis that applied a significance level of 0.0167 (0.05/3) indicated that the irritability score had a negative rank-order correlation with age at investigation (-0.246, p=0.002).

Correction 2-5
“The proportions of those who had experienced the 4 types of abuse were as follows: sexual abuse 16.8% (26/155), physical abuse 36.1% (56/155), verbal abuse 51.0% (79/155), and neglect 17.4% (27/155). It was found in the analysis that applied a significance level of 0.0125 (0.05/4) that sexual abuse was more common among female subjects than among males.”

Correction 2-6
The following sentences have been deleted since the presented findings were not clearly statistically significant in view of Bonferroni correction. The descriptions related to them in the discussion and conclusion sections, have also been corrected. The sentences or parts in red letters have been deleted.

“(P. 12) The age at first SB was lower for the subjects with a history of any type of abuse than those without the history (medians, ranges: 26, 6-68 and 28, 6-76, respectively (p=0.023, U=2247.0, z=-2.272)). The total number of SBs in the lifetime history of those with a history of any abuse was greater than that of those without the history (medians, ranges: 8, 1-141 and 4, 1-90, respectively (p=0.037, U=4214.5, z=-2.080)).”

“(P. 15) Developmental factors, such as childhood and adolescent abuse, are assumed to have an influence on subsequent SB [41]. In this study, the proportion of suicidal patients that had experienced abuse at a young age was within the range of those in Japanese studies on various SB samples [12] while the figure was generally lower than those of the studies conducted in Western countries [41]. The finding of this study that suggested the influence of the abuse on the number and the early start of SB experiences endorsed the need to investigate the role of abuse and other adversities in childhood and adolescence in the development of SB.

“(P. 16) This study also has confirmed gender and age-relevance of some SB-preceding life-problems and life events, and an influence of abuse in childhood and adolescence on SB repetition, which many previous studies on suicide victims and SB patients in emergency service settings identified.

In this correction, we appreciate much the recommendation dated on 9 Nov from you that has enabled us to rectify the inconsistency in statistical analysis.
The corrected parts of the manuscript sections with comments are pasted in the last pages of this letter.

We thank the reviewers and editors for giving us again an opportunity to improve our manuscript.

Sincerely,

Naoki Hayashi, MD, PhD.
Methods

Subjects

This study was carried out at Tokyo Metropolitan Matsuzawa Hospital, a psychiatric center for psychiatric emergencies and other regional services in central Tokyo. The patients included in the study were those consecutively admitted with SB within a 20-month period from April 2006 to November 2007 and found to have exhibited SB during the week prior to their admission. The definition of “non-fatal suicidal behavior, with or without injuries” by de Leo, et al. [13] was applied in identifying the SB subjects. The selection criteria of the subjects were (1) age at admission equal to 20 years or more, (2) a hospital stay longer than 3 days, (3) absence of prominent mental retardation or organic brain damage, (4) fluent Japanese speaker, (5) exhibited an improvement that was judged to be sufficient to enable the subject to comprehend the study procedure and safely undergo the study assessment during the hospital stay, and (6) provided the written informed consent for study participation or, in cases of involuntarily hospitalization, additional consent was provided by the patient’s family guardian.

Assessment

The assessments conducted in this study were as follows.

(1) Suicidal Behaviors

Types of SBs immediately prior to admission and the frequency and period of SBs in the lifetime history of the subjects were recorded. The list of SB types was made on the basis of that of suicide attempts used by Hosaka, et al. in the report of the 2004-2006 Japanese Ministry of Health, Labor and Welfare aided research. Beside the 5 SBs shown in Table 2, gas-poisoning, self-immolation, self-drowning or submersion, self-electrocution, gunshot, self-burning, self-stabbing, self-banging, self-dissection, self-biting, and self-scratching were individually inquired in the first stage of assessment. The next stage was asking the period and the frequency of their occurrence in the
lifetime history.

(2) Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (SCID-I, CV) [14], and Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II) [15] Psychiatric diagnoses of the subjects based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) [16], were determined by conducting SCID-I CV, and SCID-II. These are clinician-administered semi-structural interviews for the evaluation of DSM-IV axis I and II disorders.

(3) Recent life events (RLEs) and life problems (LPs)
RLEs within 1 week, during 1 week to 1 month, and during 1 month to 3 months prior to admission, and LPs before SB were recorded. 18 RLE types were selected from the item set of the studies of Paykel, et al. [17] and Heikkinen, et al. [18]. These were classified on empirical grounds into 3 domains: 9 RLEs in close personal relationships ((a) discord or conflict, (b) separation, and (c) death, each of which was further classified in terms of whether the events referred to (1) spouse or partner, (2) other family members, and (3) other close persons), 6 RLEs related to life situation ((c) troubles or changes in workplace or school, (d) loss of job or withdrawal from school, (e) financial problems, (f) moving house, (g) severe illness of any family member, and (h) legal problems), and 3 RLEs related to health conditions ((i) physical illness, (j) mental illness, and (k) pregnancy or abortion). In the analysis, the presence or absence of each domains of RLE during 3 months prior to admission was used. In the assessment of LPs, 4-point (absent, mild, moderate, and severe) scales of the same items as those used for RLEs, were used. The LP items that were rated moderate or severe were used in the analysis.

(4) Suicide Intent Scales (SIS) [19]
SIS is a 20-item semi-structured instrument designed to record information concerning a
Results

Of a total of 3450 admissions to Tokyo Metropolitan Matsuzawa Hospital during the 20-month study period, 292 cases (280 patients) with SB were identified. 225 patients fulfilled the criteria (1)-(4). 157 (69.8%) of them (and their family guardian when necessary) gave consent to participate in the study, and 155 (68.9%) of them completed the assessment. 127 (81.9%) of the subjects were involuntarily admitted. The average (SD) duration of the period between admission and completion of the assessment was 25.7 (12.0) days.

There was no significant difference in ICD-10-based diagnoses in the hospital record or demographic and clinical characteristics presented in Table 1 between the subjects of this study and the 50 patients who were approached, but did not gave informed consent.

Table 1 shows the demographic and clinical characteristics of the subjects. The subjects consisted of 68 males and 87 females. Their average age (SD) was 36.5 (11.9) years old. 49 subjects (31.6%) started to exhibit SB at an age of 20 years or younger. The rates of unemployment and living alone were over 50%. Table 2 shows the most frequent SBs that were exhibited by the subjects. The proportions of other SBs immediately prior to admission were lower than 3.3%. Over 60% of subjects had previously exhibited self-cutting and overdosing. The 25, 50 and 75 percentiles (range) of the total number of SBs in the lifetime history of the subjects were 3, 7 and 19 (1-141), respectively. The following associations of SBs with gender and age were found in the analyses where a significance level of 0.01 (0.05/5) was applied since statistical tests were conducted for each of the 5 SB methods shown in Table 2. The numbers of self-cutting and overdosing the subjects had experienced were greater for female subjects than for males (medians, ranges of females and males: 3, 0-132 and 1, 0-50 (p=0.008, U=2232.5, z=-2.67) and 2, 0-90 and 1, 0-100 (p=0.003, U=2142.5, z=-3.02), respectively). The number of self-cutting experiences had a significant negative rank-order
correlation with age at investigation (-0.252, p=0.002).

6 DSM-IV axis I disorder groups and 10 axis II PDs of the subjects are exhibited in Tables 3 and 4. Affective disorders and anxiety disorders were presented by more than half of the subjects. It was found in the analysis that applied a significance level of 0.0083 (0.05/6) that subjects with anxiety disorders were younger than those without them (medians, ranges of the age: 32, 20-72 and 36, 21-76, respectively (p = 0.005, U=2194.5, z = -2.78)). Most of the subjects had at least one PD. Borderline PD was the most frequent PD, and was exhibited by over 50% of the subjects.

The analysis that applied a significance level of 0.005 (0.05/10) indicated that PDs, patients with which were younger than those without that PD were borderline PD and antisocial PD (medians, ranges of the age: 32, 20-55 and 39, 20-76 (p<0.001, U=1923.5, z=-3.76), and 31, 20-43 and 36, 20-76 (p=0.002, U=1606.5, z=-3.09), respectively).

The proportions of the subjects who reported each of 3 domains of RLEs and LPs were RLEs and LPs in close relationships 69.7% and 60.0%, those in life-situation 61.9% and 63.2%, and those in health conditions 18.1% and 52.9%, respectively. The proportions of those who reported discord or conflict, separation and death in close relationships were 62.6%, 22.6% and 9.0%, respectively.

The following associations were found in the analysis that applied a significance level of 0.0167 (0.05/3). Female subjects reported RLEs and LPs in close personal relationships more frequently than males (Chi square=10.91, df=1, p=0.001, and Chi square=10.48, df=1, p=0.001, respectively). Those who reported life-situational RLEs or LPs were younger than those who did not (medians, ranges: 32, 20-69 and 36, 21-76 (p=0.005, U=2065, z=-2.83), and 32, 20-69 and 39, 21-76 (p=0.001, U=1866.5, z=-3.44), respectively).

The average (SD) of SIS suicidal intent scale scores was 11.7 (6.1). The proportion of subjects with high suicidal intent according to the criterion used by Skogman, et al. [6] (suicidal intent score > 18) was 13.5%. Alcohol and drug ingestion before SB occurred in 14.8% and 9.1% of the
subjects, respectively. SIS alcohol and drug ingestion scores had a negative rank-order correlation with age at investigation (-0.316, p<0.001 and -0.236, p=0.003, respectively).

The averages (SDs) of BDI and BHS scores were 30.5 (12.3) and 13.1 (4.8), respectively. The proportions of depressive symptom severity levels based on BDI were minimal (0-9 points) 5.8%, mild (10-16 points) 8.4%, moderate (17-29 points) 29.7%, and severe (30-63 points) 56.1%. Those of hopelessness severity levels based on BHS were mild (4-8 points) 14.8%, moderate (9-14 points) 35.5%, severe (15-20 points) 45.8%.

The averages (SDs) of the 3 OAS-M domain scores: aggression, irritability, and medical lethality scores were 5.9 (7.0), 3.5 (2.8), and 1.8 (1.3), respectively. The average of the medical lethality score was almost “mild (2)”. The analysis that applied a significance level of 0.0167 (0.05/3) indicated that the irritability score had a negative rank-order correlation with age at investigation (-0.246, p=0.002). The average (SD) of the PDEQ score was 11.2 (7.1). The proportion of the subjects with any threshold dissociation symptom was 91.6% (142/155).

A history of any abuse before the age of 18 years was reported by 60.6% (94/155) of the subjects. The proportions of those who had experienced the 4 types of abuse were as follows: sexual abuse 16.8% (26/155), physical abuse 36.1% (56/155), verbal abuse 51.0% (79/155), and neglect 17.4% (27/155). It was found in the analysis that applied a significance level of 0.0125 (0.05/4) that sexual abuse was more common among female subjects than among males (24.1% (21/87) and 7.4% (5/68), respectively (p=0.008, Exact test)).
The proportions of the studied subjects who reported RLEs and LPs were also comparable to those of previous studies on DSH patients [31, 38] and on those who have attempted to commit or actually committed suicide [17, 18] for the most part with the exception of a high percentage of perceived problems in mental health among subjects in this study. The previous studies [18, 20, 31, 38] reported that the rate of SB- or suicide-preceding RLE or LP in close personal relationships was approx. 60%, and other major RLEs or LPs were those associated with occupation, financial conditions, and physical health.

This study showed an association between troubles in the workplace or school before SB and younger age. Several studies [38-40] also reported that suicide or SB by young persons was frequently preceded by RLE in close personal relationships, lawsuits, and troubles in the workplace or school. It is suggestive of life-cycle-relevance of SB-preceding RLEs and LPs that these troubles are common among young suicidal patients. However, the link reported by Haw, et al. [38] between an older age and experiencing physical difficulties was not observed in this study.

In terms of gender difference in LPs, this study indicated that females more frequently experienced problems in close personal relationships as in the study of Haw, et al. [38].

Developmental factors, such as childhood and adolescent abuse, are assumed to have an influence on subsequent SB [41]. In this study, the proportion of suicidal patients that had experienced abuse at a young age was within the range of those in Japanese studies on various SB samples [12] while the figure was generally lower than those of the studies conducted in Western countries [41].

Lastly, limitations of this study need to be mentioned. First, this study is a retrospective and cross-sectional investigation, and is therefore hardly of use for determining causative factors or sequential processes of SB development. In particular, recall biases in evaluations concerning life-history factors such as abuse are inevitable. Second, PD diagnoses in this study, although based on a full application of SCID-II, could be improved. For instance, the PD diagnoses of this...
study were not exempted from the influence of coexisting axis I disorders that Zimmerman [42] pointed out. However, we consider that this influence is not so detrimental since the SCID-II was conducted after the subjects had recovered sufficiently to undergo extensive investigation.

**Conclusions**

The present study has revealed high prevalence of affective disorders, anxiety disorders and borderline PD, and severe depressive symptomatology among psychiatric suicidal patients. A large variety of the SB methods used prior to admission and a high proportion of those who had a history of SB repetition appeared to be features of this studied sample distinct from those seen in medical and emergency service settings. This study also has confirmed gender and age-relevance of some SB-preceding life-problems and life events, which many previous studies on suicide victims and SB patients in emergency service settings identified. Further studies are needed to focus on those who appear with SB in psychiatric settings for the purpose of improving the services that they are subjected to.

Correction 2-6: The following part is removed from here. “and an influence of abuse in childhood and adolescence on SB repetition,”