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Incidence of deep vein thrombosis in catatonic patients: A chart review

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ABSTRACT

Catatonia is a syndrome of motor and psychological disturbances, which is accompanied by blood stasis that increases the risk of deep vein thrombosis (DVT). The aim of this study was to examine the incidence of DVT in catatonic patients in comparison to that in non-catatonic physically restrained patients. We conducted a chart review of involuntarily hospitalized patients from 2010 to 2013 at Sakuragaoka Memorial Hospital in Japan. Routine screening of DVT has been conducted for catatonic patients and restrained patients in this hospital. Catatonic patients were identified based on descriptions of charts and sorted to two subtypes (i.e. retarded and excited forms). A Doppler ultrasound scanning was performed to examine the presence of DVT. The incidence of DVT was compared among retarded and excited catatonic patients and non-catatonic restrained patients. There were 79 catatonic patients, of whom 42 were retarded. The incidence of DVT was 25.3% (20/79) in the catatonic patients. The retarded catatonic patients demonstrated a significantly higher incidence rate than the restrained non-catatonic patients (35.7% [15/42] vs. 10.6% [31/272], adjusted OR, 4.47). The incidence of DVT in catatonic patients, especially in the retarded form, was considerably high, which suggests the importance of prophylaxis of DVT.

1. Introduction

Catatonia is a syndrome of motor and psychological disturbances, classified into retarded and excited forms. The retarded form is characterized by posturing, rigidity, mutism and immobility while the excited form is characterized by restless movements, talkativeness, agitation and confusion (Fink and Taylor, 2006). Catatonia is common among psychiatric inpatients with prevalence rates ranging from 7–15% (Fink and Taylor, 2006). This serious condition can result in critical medical complications, including deep vein thrombosis (DVT) and subsequent pulmonary embolism (PE) (Carroll, 1992, 1996).

PE commonly derives from DVT of the lower extremities (Tapson, 2008). Most DVTs originate in the calves, and 80% of distal DVTs are known to resolve spontaneously (Kaeron, 2003). However, 20% of distal DVTs can extend into a proximal vein (i.e. popliteal vein or higher). Once DVTs reach a proximal vein, PE reportedly occurs in up to 50% of the patients (Kaeron, 2003). Immobilization is an established risk factor of DVT (Tapson, 2008); hence, catatonia, especially retarded form, is expected to increase the risk of PE. Indeed, there have been several case reports on catatonia patients who suffered DVT (Lachner and Sandson, 2003) and PE (McCall et al., 1995; Ignatowski et al., 2007; Larsen et al., 2011). Thus, catatonia may complicate with a life-threatening condition.

While catatonia syndrome has widely been considered to be a risk factor of DVT (Clinebell et al., 2014), there has been no systematic survey on the incidence of DVT in patients with catatonia. The incidence of DVT is likely high in catatonic patients, especially in the retarded form, given their nature of extremely reduced physical activities. In our hospital, we have been conducting a routine screening of DVTs for catatonic inpatients since October, 2009. Therefore, we conducted a retrospective chart review to investigate the incidence of DVT in catatonic patients who underwent routine assessment of DVT. Since restrained inpatients also received the same routine assessment in our hospital, we compared the incidence of DVT in catatonic patients with that in the restrained non-catatonic patients, which was another high-risk population. Other risk factors of DVT, such as the physical comorbidities that required hospitalization within the previous 90 days, active cancer, history of DVT, and paresis of lower extremities, were also examined.

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2. Methods

This study was conducted at Sakuragaoka Memorial Hospital, a tertiary psychiatric hospital in Tokyo, Japan. This hospital has nine inpatient wards with 518 beds (one unit each for acute phase, dementia, physical conditions, and substance dependence, and five units for chronic patients), and the number of admissions is approximately 700 per year. In our hospital, we have been conducting a routine screening of DVTs for catatonic inpatients since October, 2009.

A systematic chart review of all patients with any psychiatric diagnosis who were involuntarily hospitalized between January 1, 2010 and December 31, 2013 was performed. We excluded patients who voluntarily agreed to be hospitalized as a screening process because catatonic patients are usually involuntarily hospitalized. Catatonic patients were identified based on the description from electrical medical charts, according to the 14-item Bush-Francis Catatonia Screening Instrument (BFCSI) (Bush et al., 1996). The BFCSI is a measure of the most frequent signs reported in the literature that are characteristic of catatonia (Bush et al., 1996). Patients were considered to suffer catatonia if three or more symptoms listed in the BFCSI were present. Their subtypes of catatonia (i.e. retarded and excited forms) were also identified according to the presence of the following symptoms listed in the BFCSI; retarded form was defined by the presence of immobility/stupor and the absence of excitement, and excited form by the absence of immobility/stupor or the presence of excitement. This study was approved by the institutional review board of Sakuragaoka Memorial Hospital and exempted from the requirement for informed consent because the study involved de-identified data acquired during routine care.

Catatonic patients and restrained patients wore graduated compression stockings, and some of them received subcutaneous unfractionated heparin (UFH) 5000 IU b.i.d., according to the attending doctor's judgment. The presence of DVT was examined as follows; a plasma D-dimer level was evaluated when the restraint was removed for restrained patients and when the patients became able to ambulate for unrestrained catatonic patients, respectively. D-dimer is a marker of fibrin formation and reactive fibrinolysis. D-dimer levels below a cutoff of 0.50 μg/dL help rule out the presence of thrombi (Wells et al., 2003). When the plasma D-dimer level was 0.50 μg/dL or higher, the patients underwent a Doppler ultrasound scanning of their lower extremities to examine the presence of DVT. Given that a negative predictive value of D-dimer level of <0.50 μg/dL for DVT is reportedly as high as 99% (Wells et al., 2003), patients who showed a D-dimer level <0.50 μg/dL were considered to be free of DVT.

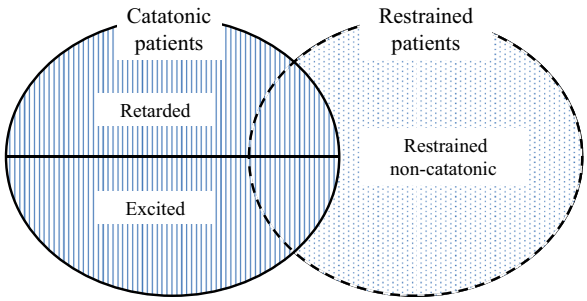

Fig. 1. Three groups compared in multiple regression analyses. Multiple regression analysis 1: Catatonic patients vs. Restrained non-catatonic patients. Multiple regression analysis 2: Retarded patients vs. Excited patients vs. Restrained non-catatonic patients.

The following demographic and clinical information was collected: age, sex, duration of restraint, past medical history, comorbid physical illnesses, diagnoses according to the International Classification of Diseases and related health problems, 10th revision (World Health Organization, 1992), the usage of SSRI and antipsychotic prescriptions. Daily doses of antipsychotics on the day of initiation of restraint for restrained patients and on the day of onset of catatonia for unrestrained catatonic patients, including depot antipsychotics, were converted to chlorpromazine equivalents (CPZE) (Inagaki et al., 1999). For patients who were receiving more than one antipsychotic drug, a sum of CPZE for all prescribed antipsychotic medications was calculated.

Statistical analyses were carried out, using the SPSS Version 21.0 (SPSS Inc., Chicago). Baseline characteristics for catatonic patients and restrained non-catatonic patients (Fig. 1) were compared, using the chi-squared test for categorical variables and the Mann-Whitney *U* test for continuous variables. Odds ratios (ORs) of DVT and their corresponding 95% confidence intervals (CIs) were estimated for all catatonic patients and then retarded and excited catatonic patients compared with restrained non-catatonic patients. We performed a multiple logistic regression analysis to adjust for sex, age group (i.e. <65 or ≥ 65 years), antipsychotic dosage, duration of restraint, usage of heparin, and some risk factors of DVT (i.e. physical comorbidities that required hospitalization within the previous 90 days, active cancer, history of DVT, and paresis of lower extremities) (Heit et al., 2002; Japanese Circulation Society Joint Working Group, 2011; Kahn et al., 2012). A p-value <0.05 was considered statistically significant and all tests were two-tailed.

3. Results

Nine-hundred and eleven patients were involuntarily hospitalized at Sakuragaoka Memorial Hospital from January 1, 2010 to December 31, 2013, and a chart review of these patients was performed. A total of 92 patients (10.1%) met the criteria of catatonia; of these, 13 patients were excluded because they did not undergo timely ultrasound scanning. Thus, 79 patients (8.7%) were included in the catatonia group. Forty-two patients were sorted to the retarded form group and 37 patients to the excited form group. In the same period, 297 patients who did not meet the criteria of catatonia were restrained; of these, five patients were excluded because they did not receive timely ultrasound scanning. Thus, 292 patients were included in the restrained non-catatonia group.

Baseline demographics and clinical characteristics were summarized in Table 1. Seventy patients (88.6%) in the catatonia group were also restrained. All patients who were not restrained were sorted to the retarded form group. The most frequent diagnosis of patients with catatonia was schizophrenia (n=46), followed by depressive episode (n=16), manic episode (n=7), mental and behavioural disorders due to psychoactive substance use (n=4), organic, including symptomatic, mental disorders (n=3) and schizoaffective disorders (n=3). In the catatonia group, the duration of restraint was significantly longer and the proportion of women was significantly greater than the other group (Table 1).

The incidence of DVT was significantly higher in the catatonic patients (25.3% [20 of 79]) than in the restrained non-catatonic

Table 1
Demographic and clinical characteristics of patients in the catatonia and restrained non-catatonia groups.

Characteristics	Catatonic patients (n=79)	Restrained non-catatonic patients (n=292)	P value
Sex, men, number (%)	31 (39.2)	165 (56.5)	0.01*
Age, mean ± SD, year	45.5 ± 15.0	47.9 ± 16.9	0.4
Usage of UFH, number (%)	15 (19.0)	56 (19.2)	1.0
Antipsychotic dosage, mean ± SD, CPZE mg/day	808.2 ± 610.6	842.9 ± 637.2	0.7
Duration of restraint, mean ± SD, hour	145.0 ± 132.4	69.1 ± 69.4	<0.001*
Usage of SSRI, number (%)	7 (8.9)	18 (6.2)	0.4
Presence of risk factors of DVT examined in this study, number (%)	3 (4.1)	23 (7.9)	0.3
Physical comorbidities that required hospitalization within the previous 90 days	3	17	0.4
Active cancer	0	4	0.3
History of DVT	0	1	0.6
Paresis of lower extremities	0	1	0.6

DVT, deep venous thrombosis; UFH, unfractionated heparin; CPZE, chlorpromazine equivalents.
P-values with significant results are labeled with an asterisk.