Regular Article

Influence of patient characteristics on duration of seclusion/restrain in acute psychiatric settings in Japan

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Aim: The aim of this study was to investigate the current state of duration of seclusion/restraint in acute psychiatric settings in Japan and the effect of patient characteristics on duration of seclusion/restraint.

Methods: During an 8-month period starting from November 2008, duration of seclusion/restraint and patient characteristics were investigated in 694 psychiatric inpatients who experienced seclusion/restraint in three emergency and three acute wards at four psychiatric hospitals. Reasons for starting seclusion/restraint were also assessed. Analysis was performed using generalized linear models, with the duration of seclusion/restraint as the dependent variable and patient characteristics and reasons for starting seclusion/restraint as independent variables.

Results: Of the patients secluded/restrained, 58.6% had a primary diagnosis of schizophrenia (F20–F29) and a large proportion (37.9%) were secluded/restrained due to hurting others. Median hours of seclusion/restraint were 204 and 82 h, respectively. The duration of seclusion was longer for patients with F20–F29 than those with disorders due to psychoactive substance use (F10–F19) or other diagnoses (F40–F99), and when the reason was danger of hurting others. In contrast, the duration of restraint in female patients and in patients with F10–F19 diagnosis was shorter.

Conclusion: The duration of seclusion/restraint at acute psychiatric care wards in Japan are much longer than those reported by previous overseas studies. Although Japanese structure issues such as more patients per ward and a lower ratio of nurses need to be considered, skills for dealing with patients with primary diagnosis of F20–F29 secluded due to danger posed to others should be improved.

Key words: acute psychiatry, generalized linear models, psychiatric inpatient, restraint, seclusion.

IN PSYCHIATRIC INPATIENT settings, seclusion and restraint (S/R) is used as a last resort to ensure the safety of the patient, other patients, and staff from disturbed behavior caused by patient symptoms.[1]

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S/R, however, infringes on patient autonomy and respect.[1] Also, patients have a negative attitude toward S/R: unlike the staff, they do not consider S/R to be a treatment and feel as if brute force was exercised, and experience feelings of guilt.[2–5] The feeling of being forced into S/R negatively affects efforts to build relationships with staff members, which in turn may reduce treatment adherence.[6,7]

Some relatively large-scale investigations of S/R use from around the world have been reported, and include a comparison of use among inpatients with

schizophrenia in Germany and Switzerland,[8] a review of annual regional data in Finland,[9] a review of forced treatments in 10 European countries,[10] and a continuous annual clinical indicators report of the Australian Council on Healthcare Standards.[11] These investigations look at regional and inter-annual differences, but do not investigate the reasons for these differences. The reality that is highlighted in such comparison, however, shows the importance of understanding the issue in each country and region.[8]

Several studies have also analyzed how factors such as sex, age, race, immigration status, or other details of patient background affect the use of coercive treatment, including S/R as well as involuntary medication. Studies have shown higher usage rates in men than women,[12,13] in younger patients than older patients,[12–15] in black patients than white patients,[12] and in refugees and immigrants than native Danish subjects.[16] Given these results, the issue of how to deal with patients at high risk for the use of S/R is being discussed.

With the goal of minimizing or eliminating S/R, various training programs and projects are being developed around the world.[17–19] In the USA, the six core strategies were published to minimize S/R.[17] Facilities that have participated in the training of these strategies have reported a reduction in the use of S/R.[20] One of the six core strategies is 'use of data'. In order to implement such projects, it is important to understand the amount of S/R currently used and to set target values and analyze it.

Hereafter, the term 'seclusion' is defined as isolation of an individual in a locked room, and, 'restraint' shall be used to refer to mechanical restraint, which is defined as the use of restraining straps, belts, or other equipment to restrict movement, while the term 'physical restraint' is defined as physically holding an individual, preventing movement.[21]

In Japan, according to a national survey of psychiatric health and welfare, S/R was used on a single surveyed date with 7741 inpatients (2.4% of all inpatients) and 5109 inpatients (1.6%) in 2003, respectively, and this grew steadily to reach 8456 (2.7%) and 8057 (2.6%) by 2008.[22] In order to better understand why the use of S/R has not fallen in Japan, Sugiyama *et al.* analyzed the frequency of use in emergency psychiatric wards.[23] During a 1-month observation period, they found that the average hours of use were 249.6 for seclusion and 172.8 for restraint. In comparison, the medians in Finland in 2004 for S/R were 17.1 h and 7.0 h, respectively,[9] and

only 47.2% of patients in Australia were secluded for >4 h in a single seclusion episode,[11] indicating longer durations in Japan compared to other countries.[24]

It was not possible, however, to compare previous studies closely from the results reported by Sugiyama *et al.* First, under the Japanese Mental Health Act, use of S/R should be recorded in daily units, so it was not possible to subtract temporary release hours to determine the actual duration. Second, the observation period was only 1 month, which included patients still under S/R for whom observation had to be terminated, so it was not possible to determine the actual duration of usage per patient. Another limitation of the Sugiyama *et al.* study was that its analysis did not include consideration of patient characteristics.

The aims of the present study were to (i) obtain more accurate data on duration of S/R use per patient in order to clarify the state of S/R in Japan as compared to other countries; and (ii) clarify patient characteristics associated with longer duration of S/R use so as to identify effective interventions.

METHODS

This study was conducted as a comprehensive research project jointly by Japan and Finland, as the Sakura Project with the goal of obtaining knowledge about the use of S/R in psychiatric hospitals.

Subjects

From among 1232 inpatients admitted to three emergency wards and three acute wards at four psychiatric hospitals participating in the Sakura Project from 1 November 2008 to 30 June 2009, the present subjects were 694 patients (56.3%) for whom S/R was used during the same period. Seclusion was used with 687 patients, while restraint was used with 148 patients. Of the subjects, 52% were male, and mean age was 45.8 ± 16.7 years.

The average number of beds in the six wards was 46.8, and the average registered nurse allocation was 10 patients per nurse per day in the emergency ward and 13 patients per nurse per day in the acute ward.

Procedure

As basic patient characteristics, data on sex, age, and psychiatric primary diagnosis based on International Classification of Disease 10th version (ICD-10) were

obtained from medical records. The main reasons for starting S/R were categorized by the nurse responsible for the patient, based on the seven categories used for reporting in Finland: hurting self; hurting others; jeopardizing own safety; obstructing treatment of others; damaging property; polydipsia; and other serious reason.

The daily duration of S/R was recorded according to the approximate estimation, with 0–8 S/R hours per day counted as 4 S/R hours, 8–16 h counted as 12 h, 16–24 h counted as 20 h, and the entire day counted as 24 h. Then, the total S/R hours per patient were calculated as the sum of daily estimated hours. The observation period was up to the end of July 2009.

The study protocol was approved by the Ethics Committee of the National Center of Neurology and Psychiatry in Japan.

Statistical analysis

Statistical analysis was performed using generalized linear models on the basis of negative binominal distribution with S/R hours set as the dependent variable, and patient characteristics and reason for starting S/R as the independent variables. In addition, dummy variables were used to process categorical data. Two-tailed $P < 0.05$ was considered to indicate statistical significance. All statistical analysis was performed using SPSS ver15.0 for Windows (SPSS, Chicago, IL, USA).

RESULTS

Table 1 shows that the most common psychiatric primary diagnosis of the subjects was schizophrenia (F20–F29) at 58.6%, and the most common reason for starting S/R was 'hurting others', at 37.9%.

Figure 1(a) shows that, for seclusion, the mean ± SD was 314.8 ± 332.4 h and the median (interquartile range; IQR) was 204 h (IQR, 96–416 h), with the highest prevalence occurring from 120 to 144 h.

Figure 1(b) shows that, for restraint, the mean was 142.0 ± 230.4 h and the median (IQR) was 82 h (29–159 h), with the highest prevalence occurring between 24 and 48 h.

Significant models were obtained from generalized linear models with S/R duration set as the dependent variable. Table 2 shows that the duration of seclusion was significantly longer for patients with F20–F29

Table 1. Patient characteristics and reasons for starting seclusion/restraint

| Patient characteristic	*n* or mean ± SD	%
Sex		
Male	361	52.0
Female	333	48.0
Age (years)	45.8 ± 16.7	
Primary diagnosis		
F0	45	6.5
F1	58	8.4
F2	405	58.6
F3	104	15.1
F40–F99 (others)	79	11.4
Reason for starting seclusion/ restraint		
Hurting self	126	18.2
Hurting others	262	37.9
Jeopardizing own safety	138	19.9
Obstructing treatment of others	89	12.9
Damaging property	11	1.6
Polydipsia	4	0.6
Other serious reason	62	9.0

SD, Standard deviation.

diagnosis than for those with disorders due to psychoactive substance use (F10–F19) or other diagnoses (F40–F99), and for patients starting seclusion due to the risk of 'hurting others' than for other reasons for starting seclusion.

Table 3 shows that the duration of restraint was significantly longer for men than for women, and longer for patients with F20–F29 diagnosis than for those with F10–F19 diagnosis. No significant difference was observed in regard to reasons for starting restraint.

DISCUSSION

This study has found that the duration of seclusion (median, 204 h) and restraint (median, 82 h) on Japanese hospital wards responsible for acute psychiatric care are essentially 10-fold higher than those reported by previous overseas studies.[9,11,24] It is crucial to clarify the reasons behind these long S/R durations.

Structure issues, such as patient-to-staff ratios and the number of patients in wards, are factors thought to influence the duration of S/R.[25] In Japan, the

(a)

(b)
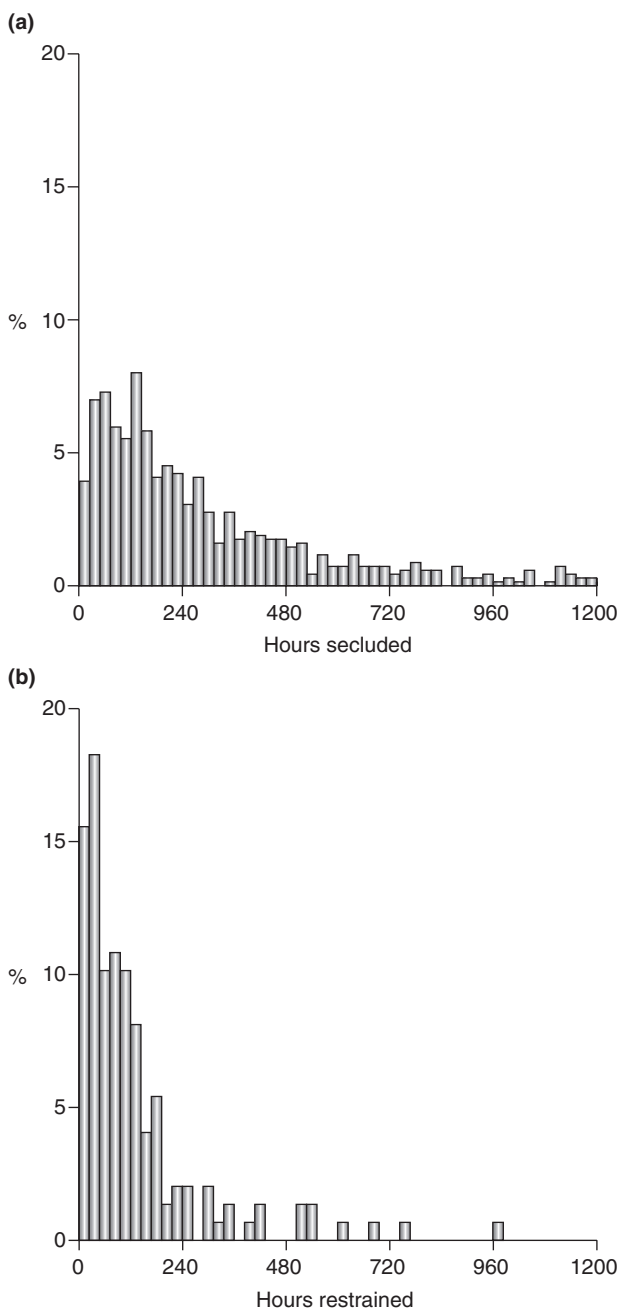
Figure 1 Hours spent in (a) seclusion (*n* = 687) and (b) restraint (*n* = 148).

average number of beds on each emergency ward is 43.9,[23] and the standard nurse-to-patient ratio is 0.50. In the UK, the average number of beds per ward is 21, with a nurse-to-bed ratio of 0.99,[26] while in Norway, the average number of beds per ward is 11

with a staff-to-bed ratio of 3.5.[27] In the UK, restraint is not used and physical restraint is used for 10–20 min. In Norway, seclusion is used for 3.0 h and restraint for 7.9 h.[24]

These differences in figures suggest that fewer patients per ward and a higher ratio of nurses or other staff would make it possible to promote a better understanding of each patient, making it possible to develop individualized response strategies to resolve difficult situations before applying S/R. Moreover, because staff can easily increase the frequency of patient observations, they frequently make efforts to substitute constant observation for S/R.[28] Care structures with a small-scale ward with a high number of staff seem to be related to shorter S/R duration.[25]

The acquisition of more accurate data on S/R duration, and comparison with previous studies from other countries have shed more light on the current state of S/R practices in Japan and the issues to be addressed. Although Japan has the same basic philosophical goal as other countries, in the using of S/R only as a last resort when no other alternatives are effective, the durations of S/R use have been shown to be longer in Japan.[23] For this reason, the care structures and processes in S/R use in other countries must be considered so as to reduce the current S/R durations in Japan.

This study showed that S/R duration is affected by patient clinical background. The fact that S/R duration was shorter for patients with F10–F19 diagnosis than for those with F20–F29 diagnosis suggests that S/R for patients with F10–F19 diagnosis is used for temporary acute condition such as delirium or excitement, and such patients regain their reality-testing abilities often in a short time.

Another suggested factor in seclusion duration was the reason for starting it; when comparing 'hurting others' to other reasons, there appears to be a tendency to delay release out of concern for the safety of the patient and others.

It is important to intervene with a focus on patients with F20–F29 diagnosis (58.6%) and patients for whom S/R was started due to the danger of hurting others (37.9%), because these two groups comprise the majority of patients who received seclusion. One strategy for dealing with seclusion started for the reason of 'hurting others' could be to promote the use of the Comprehensive Violence Prevention and Protection Program (CVPPP) in Japan. CVPPP is a comprehensive program to deal with violence effectively and appropriately, which adapts some techniques

Table 2. Factors in duration of seclusion (*n* = 682)

	Estimate	SE	Wald 95%CI	Wald χ^2	*P*
Sex					
Male			Reference		
Female	−0.031	0.0786	−0.185 to 0.123	0.155	0.694
Age (years)	0.001	0.0025	−0.004 to 0.005	0.049	0.825
Diagnosis					
F0	0.080	0.1639	−0.241 to 0.401	0.238	0.626
F1	−0.580	0.1456	−0.865 to −0.294	15.847	0.000***
F2			Reference		
F3	0.004	0.1177	−0.227 to 0.234	0.001	0.975
F40–F99 (others)	−0.574	0.1262	−0.822 to −0.327	20.731	0.000***
Reason for starting seclusion/restraint					
Hurting self	−0.308	0.1129	−0.529 to −0.087	7.451	0.006**
Hurting others			Reference		
Jeopardizing own safety	−0.331	0.1100	−0.547 to −0.115	9.051	0.003**
Other	−0.261	0.1013	−0.460 to −0.063	6.668	0.010*

*P < 0.05; **P < 0.01; ***P < 0.001. CI, confidence interval; estimate, partial regression coefficient; SE, standard error.

developed in the UK for use in Japan. The program includes breaking away[29] and control and restraint training,[30,31] as well as the prediction and prevention skills mentioned in the clinical guideline of the National Institute for Health and Clinical Excellence (NICE).[32] The program is steadily growing in Japan: as of 2010, 2764 individuals (4.3% of the 63 556 full-time nurses working in psychiatric hospitals as of 2007) have attended a 4-day program for training the trainers to be able to disseminate the techniques within their own facilities. The hypothesis of reducing the duration of seclusion, started for the reason of 'hurting others', should be validated as more staff members learn the CVPPP techniques.

A sex difference was observed with regard to restraint, with men having significantly longer

Table 3. Factors in duration of restraint(*n* = 146)

	Estimate	SE	Wald 95%CI	Wald χ^2	*P*
Sex					
Male			Reference		
Female	−0.431	0.1843	−0.792 to −0.070	5.468	0.019*
Age	0.010	0.0055	−0.001 to 0.020	3.074	0.080
Diagnosis					
F0	0.221	0.3626	−0.490 to 0.932	0.372	0.542
F1	−0.907	0.3490	−1.591 to −0.223	6.749	0.009**
F2			Reference		
F3	0.301	0.2878	−0.263 to 0.865	1.095	0.295
F40–F99 (others)	−0.386	0.2995	−0.973 to 0.201	1.660	0.198
Reason for starting seclusion/restraint					
Hurting self	0.170	0.2746	−0.368 to 0.709	0.385	0.535
Hurting others			Reference		
Jeopardizing own safety	0.118	0.2211	−0.315 to −0.551	0.284	0.594
Other	−0.379	0.2577	−0.884 to 0.126	2.162	0.141

*P < 0.05; **P < 0.01. CI, confidence interval; estimate, partial regression coefficient; SE, standard error.

duration compared to women, with no effect of reason for restraint. Given that restraint limits the patient even more than seclusion does, it is chosen in the more severe cases. This suggests that delayed attempts in temporary release are because the patient is male and not due to the reason for restraint.

Regarding the use of S/R and patient characteristics, some studies have separated patients into two groups, receiving or not receiving S/R, with reports of more use of S/R for male patients, younger patients, black patients, and immigrant patients.[12–16] Almost none, however, has investigated the effect of these on the duration of S/R. For countries using S/R from several hours to <1 day, only the use of S/R and not its duration may be important in determining the effect of patient characteristics. There are also countries promoting projects to reduce seclusion, such as the Netherlands, which reports a seclusion duration of 16 days,[33,34] and there are probably other countries such as Japan that have an S/R duration lasting several days. Accumulating knowledge about patient characteristics affecting S/R duration will be important for these countries.

Conclusion

The median S/R duration in acute psychiatric wards in Japan was longer than those reported in previous studies. It is necessary to identify differences in care structure and process as compared to countries with lower S/R duration. This study also found that the duration of S/R is affected by patient clinical background. In working to minimize the duration of seclusion, the benefits of skills for care of patients with danger of hurting others, such as CVPPP promoted in Japan, should be validated.

The number of hospitals participating in this study as well as the range of ward types was limited. In psychiatric care in Japan, S/R is primarily used with patients who are difficult to manage in chronic wards, and patients with cognitive disorders in wards specialized in dementia care. Because other factors could be influencing the duration of S/R in patients in such wards, additional research is needed that analyzes a wider range of targeted wards.

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