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Letter to the editor

Choking incidents among patients with schizophrenia may be associated with severity illness and higher-dose antipsychotics

Dear Editor,

Choking incidents, also known as café coronary, are considered more prevalent among psychiatric patients than among the general population [1,2]. Despite frequent fatal consequences, to our knowledge, there have been few systematic or comprehensive studies on choking incidents among psychiatric patients and, in particular, among patients with schizophrenia. We were thus prompted to carry out a retrospective cohort study of choking incidents among patients with schizophrenia.

Ethical aspects of this study were reviewed and approved by the Human Research Ethics Committee at the Ashikaga Red Cross Hospital. For our retrospective cohort study, we included all 1719 schizophrenia inpatients who were hospitalized in the psychiatric unit in Ashikaga Red Cross Hospital during the period between October 1999 and March 2016. Diagnosis was based on criteria ICD-10, and all patients with schizophrenic disorders (F2) were included. The patients with schizophrenia were categorized into two groups: the choking group, which included those who exhibited a choking incident, and the non-choking group, which included those who did not exhibit a choking incident while they were in the hospital. Choking incidents were limited to those that needed substantial medical treatment after the incident, including the Heimlich maneuver, manual suction of choking-related food, or resuscitation.

Age, gender, presence of chronic disease(s), dose of antipsychotics upon admission, use of first-generation antipsychotics, and Global Assessment of Functioning (GAF) [3] upon admission were compared between the two groups. Doses of prescribed antipsychotics were expressed in terms of the equivalent dose (in milligrams) of chlorpromazine [4]. For statistical analysis, the Mann-Whitney *U* test was used to compare age, dose of antipsychotics, and GAF, whereas Fisher's exact test was used to compare gender, presence of a chronic disease(s), and use of first-generation antipsychotics. We also described in detail the situations when the choking incidents occurred, including the dental/oral problems that the patients had, what food they choked on, the time of day during which the incident happened, the presence of fast eating syndrome [5] or pica [6] when choking occurred, and complications after the choking incidents. Fast eating syndrome, which is rarely observed in psychiatric inpatients [7], is associated with choking incidents [2,5]. In this study, fast eating syndrome was defined as a behavior that consisted of eating too quickly or taking inappropriately large boluses of food [7] and had to be noted by both a psychiatrist and a psychiatric nurse.

Of 1719 inpatients with schizophrenia, 11 (0.6%) experienced choking incidents (Table 1). Compared with the control group, the choking group had a lower GAF score ($P < 0.01$) and a tendency to have a higher antipsychotic dosage ($P = 0.06$) and to be prescribed first-generation antipsychotics ($P = 0.06$), whereas age, gender, and the presence of chronic disease(s) were not statistically different between the two groups. Of the 11 patients with choking, two had full dentures. The most common choking-related food was bread ($n = 3$, 27.3%), followed by meatballs ($n = 2$, 18%). Of the 11 choking incidents, 5 (45.5%) occurred at breakfast and 5 (45.5%) at lunch. Fast eating syndrome was noted in three patients (27.3%), and one patient (9.1%) choked on a non-edible object, i.e., pica. Two cases (18.2%) were fatal and five (45.5%) resulted in aspiration pneumonia after the incidents.

Our results yielded two findings. First, choking incidents among patients with schizophrenia were associated with severity of illness and might be associated with higher-dose antipsychotics and use of first-generation antipsychotics. Second, specific foods, i.e., bread and meatballs, and fast eating syndrome might be risk factors for choking incidents. We found that a greater severity of illness is associated with choking incidents among patients with schizophrenia. Swallowing disorders are quite common in schizophrenia, and they fall into two categories, antipsychotic-induced swallowing disorders and abnormal eating, i.e., fast eating syndrome and pica. The association noted here between choking incidents and higher-dose antipsychotics is consistent with those previous findings on swallowing disords in schizophrenia [7,8]. The association between first-generation antipsychotics and choking incidents could be an epiphenomenon because patients taking first-generation antipsychotics might be older and have more severe illness and longer duration compared with patients taking second-generation antipsychotics. Still, first generation antipsychotics have more extensive dopamine blockade than second generation antipsychotics, which can lead to drug-induced swallowing disorders [7]. Abnormal eating, i.e., fast eating syndrome and pica, is rarely but specifically found in patients with schizophrenia [7]. According to Fioretti et al. [2], 4 out of 31 psychiatric patients with choking incidents (12.9%) resulted from fast eating syndrome, which also accounted for 2 out of 7 cases (28.6%) in fatal or grave cases subsamples. A meatball, which was identified as having the second-highest choking risk in our study, can block the airway when fast eating syndrome occurs and is swallowed without chewing. Our results and those of Hwang et al. 2010 [9] suggested that bread might require special attention when it comes to preventing choking.

Our study has several limitations that should be considered when interpreting the results, a small number of patients with choking includes incidents, and lack of assessment of the number of remaining teeth and evaluation of swallowing function. Despite these limitations, our study found that choking incidents among patients with schizophrenia may be associated with severity of illness and higher-dose antipsychotics. To reduce the risk of choking accidents, meticulous care should be taken with these patients, especially with respect to dietary content and fast eating syndrome.

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Table 1
Characteristics of patients with choking incidents and their choking situations.

Case	Age/gender	Chronic disease(s)	Antipsychotic medication: CP equivalents (use of first-generation antipsychotics)	GAF	Dental/oral problems	Food	Fast eating/pica	Meal time	Medical complications
1	20/F		437.5 (+)	30		Vomitus		Breakfast	Pneumonia
2	25/M	Traumatic brain injury	40 (−)	30		Bread		Lunch	
3	37/M	Dilated cardiomyopathy	500 (+)	15		Mattress	Pica	Lunch	
4	53/F	Diabetes	1350 (+)	10		Loquat	Fast eating	Breakfast	Pneumonia
5	54/M		450 (+)	25		Banana		Breakfast	Pneumonia
6	58/M	Diabetes	120 (+)	30		Biscuit		Breakfast	Pneumonia, death
7	59/F	Heart failure	100 (−)	25		Bread	Fast eating	Breakfast	
8	60/M		235 (+)	20		Noodle		Lunch	
9	64/F		450 (−)	20		Meatball		Lunch	
10	68/F	Diabetes, breast cancer	875 (+)	20	Full denture	Bread, meatball	Fast eating	Tea time	Pneumonia, hypoxic encephalopathy, death
11	75/F		0 (−)	30	Full denture	Steak		Lunch	
Choking group total	52.5 ± 17.5 54.5%, male	54.5%	414.3 ± 403.4 (first-generation, 63.6%)	23.2 ± 6.8	2 cases with full denture	3 bread cases, 2 meatball cases	3 fast eating cases, one pica case	5 at both breakfast and lunch	5 pneumonia cases 2 fatal cases
Control	46.7 ± 15.8 36.6%, male	33.0%	288.1 ± 440.8 (34.8%)	29.4 ± 5.1	Not assessed	Not assessed	Not assessed	Not assessed	Not assessed
P-value	Age, 0.22 Gender, 0.54	0.19	Dose, 0.06 First-generation use, 0.06	< 0.01					

Abbreviations: CP, chlorpromazine; GAF, Global Assessment of Functioning; F, female; M, male.

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Conflict of interest

The authors declare that they have no competing interests.

Author contributions

MF conceived the project, acquired and analyzed data, and wrote the manuscript. TT and AK acquired data. All authors contributed to data interpretation and writing the final manuscript.

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