Choking Incidents among Psychiatric Patients: Retrospective Analysis of Thirty-one Cases from the West Bologna Psychiatric Wards

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Objective: To determine the rate of choking incidents among the psychiatric population of 4 inpatient facilities, classifying the incidents according to their probable etiology.

Method: All incidents recorded over 18 months were retrospectively analyzed for demographic variables, psychiatric and medical diagnoses, and drug therapy at the time of the incident. Where possible, patients underwent psychiatric, neurological, and medical examination.

Results: Thirty-one incidents were recorded involving 18 patients at a rate of one incident every 56.32 months’ hospitalization per person. One case proved fatal, one patient died several weeks after the incident from aspiration pneumonia, and 5 patients needed reanimation or the Heimlich manoeuvre. Etiological classification showed that incidents due to bradykinetic dysphagia and “fast eating” were the most numerous, even among the fatal or grave cases.

Conclusions: Various simple, effective preventive measures emerge from the study.

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Key Words: psychiatric institutions, psychiatric patients, airway obstruction, psychotropic drugs, eating habits

Choking while swallowing food or drinks is a cause of death that has long been known and studied among the psychiatric population. Most of the literature relates to psychiatric hospitals before 1980. With the shift from hospital-based to community-based psychiatric care, the interest of researchers in this issue seems to have dwindled, although it has not been shown whether this kind of accident is less common in the psychiatric population currently being treated in the community. Hospitals nonetheless continue to have these episodes in clinical practice, and they are potentially fatal, so the topic seems to call for a new and deeper investigation.

The present paper retrospectively reviews all choking incidents over 18 months in 3 wards (2 long-stay and one short-stay) and one therapeutic community from the Bologna Mental Health Service. Interest in such research was sparked by the case of a young patient who died of aspiration asphyxia and by a spate of nonfatal choking episodes. The paper concludes with a scheme for the prevention of such incidents.

Choking Incidents in the General Population and in Psychiatry

The high incidence of asphyxia caused by food in the trachea has been reported since the 1970s. The most recent estimate puts this incidence at 0.66 fatalities per 100 000 members of the general population every year (1). Many countries have initiated preventive campaigns to educate the population at large and avert the risk of death by this kind of accident. In the United States of the 1970s, for instance, choking was the sixth cause of accidental death, more common than air crash or firearms fatalities; some 3900 able-bodied people lose their lives this way every year (2). The prevention schemes and the widespread teaching of the Heimlich manoeuvre (3) appear to have reduced the magnitude of...
the problem. Certain groups of people are generally seen as
at risk: young children (4), the elderly, neurological patients
(5), alcoholics and drug addicts and, of course, institutional-
ized psychiatric patients (1). Among these last, the high rate
of aspiration asphyxia was well known in psychiatric hospi-
tals before the psychotropic era. Hollister (6,7) carried out the
first systematic study on the topic in a neuropsychiatric hos-
pital of 1325 beds over a span of 6.5 years, during which time
19 fatal accidents took place: only 3 of these 19 patients were
on psychotropic drugs. The author claimed that such deaths
became no more common after the advent of psychotropic
medication and pointed out the prevalence of similar inci-
dents among epileptics and those with organic brain damage.
The pathophysiological mechanism he put forward involved
glottal spasm secondary to epileptic fits and/or irritation of
the airways through food aspiration, which was in its turn
cau sed by epileptic seizure—so-called masked fits, thought
to be more frequent in epileptic or brain-damaged patients.

Following these early works, many authors have studied the
subject clinically and epidemiologically in the quest for
etiological factors.

Drug-Related Etiology

No direct, clear-cut connection has ever been shown be-
tween psychotropic drugs and fatal asphyxia. Clinical
experience, single case reports, epidemiological surveys, and
pathophysiology studies, however, do suggest that they may
play a key role through diverse pathogenetic mechanisms.

Some authors have pointed out how the well-known de-
pression of the bulbar centres, variously brought about by all
kinds of psychotropic medication, causes, among other
things, an inhibition of the cough reflex, the swallow reflex,
and the gag reflex (8–11). Moreover, patients on psychotropic
drugs may theoretically have a combination of 1) dopamin-
ergic blockade with peripheral and central effects on deglutition
(block or timing upsets in the components involved in the
swallowing process) and 2) cholinergic blockade with
potential impairment of esophagus motility and the gag re-
flex. Neuroleptics, antidepressants, and antiparkinsonians are
often used together and have an anticholinergic synergetic
effect on the swallowing process (12). In the only prospective
study we have come across in our review, Hsieh and others
(13) find such a connection: the incidence of asphyxia among
psychiatric patients is linked to the neuroleptic dosage and the
anticholinergic dosage, though also to patient age.

Other researchers have suspected an indirect mechanism,
mediated by “epileptic equivalents,” along the lines of Hol-
list er’s original suggestion. They see these as being in their
turn caused by a lowering of the convulsive threshold,
whether through the use of neuroleptics (14) or through a
reduction in the blood levels of anticonvulsants by enzymatic
induction due to psychotropic use in general (12). Moore and
Book (15) see another cause in the interference of drugs with
heart rhythm and with coordination between the breathing
and swallowing reflexes.

Lastly, more recent research has focused on a correlation
with the neurological side effects of many psychotropics,
especially neuroleptics. Manometry studies on the esophagus
and pharynx have shown that both early, drug-induced ex-
trapyramidal syndromes (16) and tardive dyskinesia (17–19)
may entail complex dyskinesias of the tongue and oro-
pharynx, which are conjectured to lie at the etiologic root of
many psychiatric patient asphyxia cases.

Nondrug-Related Etiology

Of the nondrug-related mechanisms, overeating and poor
eating habits may be associated with regressive states during
psychosis (20,21), as well as with mental retardation. It has
long been noticed that hospital routines and the regression
institutional contexts typically bring about converge to trig-
ger what is called “fast eating syndrome,” which so easily
leads to choking incidents.

Other alleged factors of a nonspecific but potentially de-
cisive nature are poor physical condition, intercurrent debil-
tating diseases, and impaired dentition (22). Among the
diseases often found with psychic disorders and associated
with this kind of incident, the most important are undoubtedly
neurological: paralysis, dementia, Huntington’s disease
(23,24), and Parkinson’s disease. Some have pointed to
pathophysiological similarities with early, drug-induced ex-
trapyramidal syndrome or with tardive dyskinesia (25–27).

Other authors have traced the pathology to alcohol con-
sumption combined with psychotropics (28) and to gastric
hyperacidity in catatonic patients, which may cause abnormal
gastroesophageal reflux and aspiration of matter into the
airways (29).

Hussar (30) examined 2 case series, assessing 9 episodes
of choking, only 2 of which involved psychotropic medica-
tion. He came to the conclusion that the main defect in
swallowing was due to schizophrenia. In 1969, the same
author studied psychotropic-related dysphagia using
videofluoroscopy and X-ray with barium swallow (31). He
found that 47% of dysphagic schizophrenic patients had used
an average of 900 mg chlorpromazine equivalents, while 44% of
such patients were not taking any neuroleptics. These
findings led him to confirm his hypothesis as to the direct
association of schizophrenia with the risk of impaired
deglutition.

Epidemiological Studies and Etiological Classifications

Only since the end of the 1970s have systematic studies
recorded the number and estimated the incidence of these
cases among the psychiatric population according to any
overall etiological classification.
In Craig’s study (12), the 48 cases of death from asphyxia or aspiration pneumonia that occurred in 8 years represented 2% to 5% of all hospital deaths at a rate of 1 to 2 per 1000 beds each year. Three groups of about the same size were distinguished: 1) elderly patients with a history of serious physical disturbances; 2) patients whose deaths were associated with epilepsy and low levels of anticonvulsants in the blood; 3) deaths through choking not otherwise explainable. The author concluded that epilepsy, low anticonvulsant blood levels, and neuroleptics and other drugs with anticholinergic properties were incontrovertible risk factors.

In 1991, Bazemore and others (32) classified 32 nonfatal choking incidents occurring to 28 patients into 5 types: 1) bradykinetic of alleged neuroleptic-induced etiology, 2) dyskinetic, that is, associated with tardive dyskinesia, 3) fast eating syndrome due to bad eating habits, 4) paralytic, traceable to disturbance of the cerebral trunk, and 5) medical forms due to other intercurrent medical diseases. Eighty-six percent of the sample showed some anomaly of the swallow reflex at videofluoroscopy. Those with bradykinetic dysphagia comprised 25% of the group, while the cases of paralytic dysphagia presented the most serious picture of choking syndrome.

An overview of the literature shows, in short, that the phenomenon of aspiration asphyxia in psychiatric patients may have a wide range of etiologies and that an important role is played by factors not directly related to the institutional setting.

Methods

A retrospective analysis was made of all choking incidents occurring from January 1, 1993, to June 30, 1994, in 2 long-stay wards of the Bologna ex-Psychiatric Hospital “F Roncati” (60 beds), one therapeutic community formed of patients discharged from the same former asylum (7 beds), and one short-stay ward (30 beds) designed for patients from the outlying catchment area. The sources of information for the survey were ward reports and clinical files. All those working in the 4 units were also given a questionnaire asking for memories of any other incidents. The definition of an “incident” was “an acute episode in which the patient coughed incessantly or experienced a colour change (with inability to speak or cough effectively) while ingesting food or drink. The solid or liquid food had to be expelled to terminate the event” (32, p 3).

This led to the identification of 8 choking-attack patients in the short-stay ward and 10 in the former psychiatric hospital wards and the therapeutic community. Seven of these patients had 2 or more incidents over the observation period, giving a total of 31 incidents. For each case, the following data were collected: demographic characteristics, psychiatric diagnosis, medical comorbidity, and drug therapy at the time of the incident. Neuroleptic dosages were converted into equivalent milligrams of chlorpromazine according to the Bellantuono table (33). Where possible (in 13 cases), patients underwent a full psychiatric, neurological, and medical examination to ensure that the type of asphyxia incident had been classified reliably. Information from documents was in each case confirmed by direct examination, and so all 18 patients were included in the sample for analysis. Our classification followed the 5-class system of Bazemore and others (32), though unlike the authors of that paper, we put 3 patients into more than one class because it was apparent that they had multiple etiological factors. Subsequent analysis of those who had choked more than once concentrated on the first or worst such incident, so that in the end only 18 cases were included.

Results

Over the observation period, 31 incidents occurred to 18 patients (9 men and 9 women; mean age 67.16 years, range 38 to 87) at a rate of one incident every 56.32 months per person hospitalized (1.7 incidents every 100 months per person). One episode proved fatal directly, and one person died some weeks after the incident from pneumonia of probably aspiratory origin. Five cases needed reanimation or the Heimlich manoeuvre, and 4 of these were admitted to intensive care. There were thus actually 7 grave or fatal cases at the rate of one such incident for every 249.42 months per person hospitalized (0.4 incidents every 100 months per person).

As many as 17 out of 18 patients were being treated with at least one neuroleptic, at a mean dosage of 250.9 mg chlorpromazine per day, the range going from 25 to 950 mg/day (median 180.5 mg). Three patients were on polypharmacy that involved a central anticholinergic antiparkinsonian, while 2 patients were on one neuroleptic combined with one tricyclic antidepressant. As many as 15 of the 17 patients on neuroleptics were taking a phenothiazine, the anticholinergic action of which is known to be more pronounced than in any other class of neuroleptic. The mean dosage of neuroleptics was slightly lower in the 7 grave episodes (212.3 mg chlorpromazine equivalents) but higher in the 7 patients with multiple episodes (331.1 mg) than in the group as a whole. We compared the dosages of neuroleptics between severe and nonsevere cases and between single and multiple incidents using the Mann-Whitney test adjusted for ties. Both tests were not significant, possibly because of the small size of the sample (severe versus nonsevere: \( z = 0.45, P = 0.64 \); single versus multiple incidents: \( z = -1.55, P = 0.12 \)).

Nine patients had a diagnosis of schizophrenia, 5 were mentally disabled, 5 had a diagnosis of affective disorder, 2 had a diagnosis of mental deterioration, and 2 were alcohol-
ics. Epilepsy (one case), Parkinson’s disease (2 cases), diabetes (3 cases), and cardiovascular diseases (7 cases) were the most common medical comorbidities.

According to the classification of Bazemore and others (32), for the group as a whole, the most common types of asphyxia were bradykinetic (9 cases, 50%), dyskinetic (4 cases, 22.2%) and “fast eating” (4 cases, 22.2%); one case was secondary to paralytic and one case to medical problems. We also calculated the mean dosages of neuroleptic (in chlorpromazine equivalents) in the 3 most numerous classes: bradykinetic (320 mg), dyskinetic (235.2 mg), and “fast eating” (133.0 mg). We analyzed these findings using the Kruskall-Wallis test, which revealed no significant differences (H = 3.6, P = 0.3).

In the 7 fatal or grave cases subsample, bradykinetic (4 cases, 57.14%), dyskinetic (2 cases, 28.57%), and fast eating (2 cases, 28.57%) were still the more common causes. Finally, considering separately the 7 cases with multiple incidents, we found that bradykinetic (4 cases, 57.14%), dyskinetic (2 cases, 28.57%), and fast eating (2 cases, 28.57%) were the more common etiologies.

Discussion

The present paper springs not only from the interest created by choking incidents in the wards mentioned but also from the assumption that simple precautions in feeding might be of great preventive benefit. For organizational reasons, we were unable to perform sophisticated tests like videofluoroscopy or X-ray with barium swallow and hence to study the swallowing mechanisms or compare diagnosis against the 5 Bazemore classes with complete certainty.

We did, however, identify some highly likely mechanisms, bearing in mind clinical and extraclinical variables, the general medical, as well as the neurological and psychiatric examinations. What we found was that some cases could not easily be fitted into one single category; quite often, multiple etiologic factors are discerned, as the literature makes clear (34).

The conclusions drawn from our broadly descriptive study are suggestive only. Naturally, other studies of a prospective kind are needed to provide an exact picture of the phenomenon. Nonetheless, certain points do deserve discussion here.

Of all the risk factors commonly cited in the literature, it is drug therapy that has received the closest study. Craig (12) saw polypharmacy as one of the main risk factors for choking incidents in view of the anticholinergic role played synergistically by various drug categories (neuroleptics, antidepres- sants, and central anticholinergics). In our patient group, polypharmacy was fairly rare: in only 3 patients was there a combination of medium- or low-dosage neuroleptics and central anticholinergics. What is interesting is that virtually all patients in the group were taking phenothiazines (thioridazine, chlorpromazine, and fluphenazine), whose pronounced anticholinergic and dopaminergic-blocking properties readily raise our suspicions in choking incidents. The very presence of 9 cases attributed to bradykinesia and 4 to tardive dyskinesia is enough to highlight the pharmacological factor behind this phenomenon.

Our cases seem to include other risk factors, such as age, which may be of indirect relevance for its connection with paralytic or idiopathic Parkinson-related swallowing disorders, or with involutorial processes, which may in turn play their part, whether indirectly (poor overall condition, inter- current opportunistic diseases) or directly in the form of neurologically caused swallowing disorders. Again, the presence of a relatively high percentage of organically brain-damaged patients (cerebropathic mental retardation, Parkinsonism, dementia, epilepsy) accords with Hollister and Kozek’s first finding, back in 1968, of a frequent relationship between choking and epilepsy or brain damage (7). Although he was driven to admit a connection between such incidents and the use of psychotropics, especially chlorpromazine, his theory of drug-induced “masked fits” has never subsequently been proved. A more probable explanation has turned out to be that of fine neurophysiological alterations in the motor sequence of deglutition, and this is consistent with our findings.

As for bad eating habits (the so-called fast eating syndrome), they are fully represented in our institutionalized patient group. Half of the patients have this problem, which can be corrected by educational and rehabilitative protocols (35). It is an established fact that fast eating is one of the most deep-rooted bad habits in psychiatric hospitals, where the meals have to be hurried through in order to speed up clearing away operations.

The study of choking incidents in the clinical psychiatric context is, of course, preliminary to the setting up of a preventive program, which must take into account all known and supposed risk factors and enable health care providers, relatives of patients, and patients themselves to recognize these incidents and to provide first aid to those in need. Simple measures have proved effective in dramatically reducing the number of choking incidents.

First of all, physicians should regularly inquire at any admission, especially of patients over 60 years old, about the presence of swallowing problems or the occurrence of previous incidents and their gravity, as well as explore the possible link with drugs, medical conditions, or eating habits (36). Patients should be periodically questioned about the problem when on neuroleptic treatment and, for inpatients, nursing staff should be taught to recognize and swiftly report such difficulties. Full assessment of neurological and medical
In all patients with even mild difficulties, polypharmacy should be avoided, and in the choice of sedative and/or antipsychotic drugs, preference should be given to compounds with minimal anticholinergic activity.

Educational strategies for improving eating habits and environmental modifications in the delivery of meals in psychiatric institutions have proved extremely important for all kinds of psychiatric patients, in particular for the young mentally disabled (35) and for psychotic persons in regressive states.

Finally, the principles of first aid for victims of choking incidents should be widely taught in psychiatric institutions and possibly displayed in the form of posters inside psychiatric wards. They should include the traditional Heimlich manoeuvres, both the one used with collaborating, fully conscious patients, and the alternative required with unconscious choking victims. We are currently experimenting with a thorough protocol for the prevention of these incidents in Bologna psychiatric wards (unpublished observations 1996).

In conclusion, choking incidents are still common in our short- and long-stay psychiatric units. Our study confirms the urgent need for care by the physician in setting up a drill to prevent such episodes among patients presenting risk factors, which our study suggests are age, use of antidopaminergic and anticholinergic drugs, polypharmacy, chronic neurological disorders (epilepsy, Parkinson’s disease, tardive dyskinesia, poststroke disabilities), low intelligence, bad eating habits, and physical diseases.

Clinical Implications

- Choking incidents are still quite common in psychiatric wards.
- Their etiology is various but generally preventable.
- A protocol for first aid to the choking patient should be available in every psychiatric ward, and simple preventive measures should be put into practice.

Limitations

- The study has a retrospective design.
- There was no comparison group.
- Patients could not undergo sophisticated radiological tests as a part of the etiological investigation.

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References

Résumé

Objectif : Déterminer la fréquence des incidents de suffocation dans la clientèle psychiatrique de 4 établissements hospitaliers, les incidents étant classés selon leur étiologie probable.

Méthode : Tous les incidents relevés pendant 18 mois ont été analysés rétrospectivement à l’égard des variables démographiques, des diagnostics psychiatriques et médicaux et de la pharmacothérapie au moment de leur survenue. Dans la mesure du possible, les patients ont subi un examen psychiatrique, neurologique et médical.

Résultats : Trente et un incidents ont été relevés chez 18 patients, à la fréquence d’un incident tous les 56,32 mois d’hospitalisation par personne. Un cas s’est révélé mortel, un patient est décédé plusieurs semaines après l’incident à la suite d’une pneumonie de déglutition et il a fallu réanimer 5 patients ou effectuer la manoeuvre de Heimlich. La classification étiologique a démontré que les incidents dus à la dysphagie bradycinétique et à une « alimentation rapide » étaient plus nombreux, même dans les cas mortels ou graves.

Conclusions : Dans l’étude, on décrit diverses mesures de prévention simples et efficaces.