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## Parameters of ante-mortem delirium

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### Summary

**Objectives.** The aim of this study was to investigate the parameters of ante-mortem delirium of the patients in a closed psychiatric institution and to compare them with the ante-mortem psychopathology of the medical patients.

**Methods.** There were 139 medical records of the patients analyzed, who died during the period of 1997–2003 at the in-patient psychiatric institution. The diagnoses were recorded according to the International Classification of Diseases, 10th Revision (ICD-10) criteria. Patients' data included age, gender, previous psychiatric disorders, current somatic and psychiatric morbidity, and comorbidity.

**Results.** The incidence of delirium was 83.7%. The delirium group included more elder, male persons who were more likely to have dementia and less inclined to depression. Surprisingly the incidence of delirium among non-dementia men was quite high – 76.9%, as compared to non-dementia women – 23.1% (P=0,008). The duration of delirium differed from 1 to 1335 days. Longer delirium was observed among elder than 75 years (87.7, SD 183.9 vs 52,6, SD 121.4 days; P=0,019) and dementia (83.6, SD 173.6 vs 13.5, SD 11.6 days; P<0,001) patients, but did not differ in gender groups.

**Conclusions.** Ante-mortem delirium occurred more commonly in more elder and demented patients. The duration of ante-mortem delirium was shorter in younger and non-dementia patients. Patients of the psychiatric institution tend to have longer deliriums than medical patients. The patients with depression and the history of alcohol abuse were not likely to get ante-mortem delirium. Before death in many persons hyperactive and mixed delirium transformed into hypoactive.

**Key words:** ante-mortem delirium, terminally ill, dementia

### Introduction

Defined as a disturbance of consciousness characterized by an acute onset of impaired cognitive function [1]. It is associated with adverse outcomes including higher mortality, longer lengths of hospital stay, increased likelihood of institutionalization

and cognitive and functional decline [2]. Despite the reversibility of the symptoms of delirium, it often occurs in severely ill patients, a few hours or days preceding death, particularly during the final 24–48 h, and it is considered a sign of an incipient “hard way to death” [3, 4]. Therefore being the most serious psychiatric disorder delirium goes beyond the boundaries of psychiatry and is frequent disturbance in psychiatric practice as well as in somatic [5]. The most extensive studies of ante-mortem delirium in the world practice were carried out in oncology clinics and departments of palliative care [6-11], however, the research of delirium in psychiatric institutions has been insufficient insofar [12], also there have not been any studies of ante-mortem delirium in psychiatric institutions.

Our practice suggests that the features of delirium observed in the somatic institution may differ from that of the psychiatric institution, since the reason for hospitalisation at the psychiatric institution is usually the delayed delirium, which failed to be treated at home or in the somatic institution. On the other hand, patients at the psychiatric institution are usual physically healthier and more uniform from this point of view [13]. The aim of this study was to investigate the parameters of ante-mortem delirium of the patients in closed psychiatric institution and to compare them with the ante-mortem psychopathology of the medical patients.

### Methods

The permission to carry out the study was obtained from the Bioethics Committee No. 14 [2004. 02. 17]. This is a retrospective study carried out 2003-2004 in psychiatric hospital, the unit of Alzheimer disease and somatic psychiatry. This is 30 bed unit, which has been working for more than 30 years. This Unit is functioning in a big psychiatric hospital (the number of beds from 1997 to 2003 reduced from 2000 to 700). The patients of different origin dementias and other organic mental disorders as well as the mental patients who previously suffered of somatic diseases record are treated in the Unit. The patients are sent to this Unit from home or other hospitals or are transferred from other units of the psychiatry hospital. All the necessary tests are carried out here (laboratory, neuro-visual, electro-physiological) where not only psychiatrists but also the specialists of internists, surgeons and neurologists work.

From the start of 1997 until 2003 the total number of incoming patients was 2144 (1241 men and 903 women), of those 1002 were primary patients. Medical records of the 139 patients, who died during the period of 1997-2003 at psychiatric hospital, the Unit of Somatopsychiatry, were analysed.

The data was collected for the questionnaire of the research, which recorded the dates of birth, death, also the days of hospitalisation, the number of hospitalisations of the patients. Delirium (if such occurred) as well as the disorder of cognitive functions (or dementia if such occurred) manifestation dates, were established with regard to objective data, the clinics was also described. Having established, that the symptoms of delirium were present, the prevailing and motor activity preceding death was assessed. Psychiatric and somatic diagnoses were recorded with regard to ICD-10 (International Classification of Diseases, Tenth Revision). The main psychiatric diagnoses which led

the patients to hospitalisation were established – deliriums of different origin, dementia and depressive disorders and co-morbid psychiatric pathology, which could have influenced the development of ante-mortem mental disorders – dementias of different origin, non-psychotic organic mental disorders as well as somatic pathology – cardiovascular, cerebrovascular, respiratory, digestive, urogenital and endocrine system disorders as well as cancer in some of the systems.

The obtained data were processed with statistical package SPSS-14. The arithmetic means, mean square deviations were established, the reliability of two arithmetic means was tested against Student (t) criteria. The differences of delirium incidence in age, gender and dementia groups were compared against the chi square test ( $\chi^2$ ) and contingency tables. The differences of delirium duration and age differences in the research group were tested against non-parameter Mann-Whitney U criteria.

## Results

### General characteristics of deceased patients

Some 139 patients died during the period of 7 years. One of the cases was suicidal; therefore it was eliminated from the study. Also, 15 patients with abstinence with delirium (or *delirium tremens*) were eliminated from the study. The deceased patients were divided into delirium 103 (83.7%) and non-delirium 20 (14.5%) groups with regard to whether they were in delirium clinics or not, the demographic and clinical data in the groups was assessed and compared. The delirium group included more elder, male persons who were more likely to have dementia and less inclined to depression, however, there was no major difference between the groups in terms of family, the place of residence and abuse of alcohol (Table 1 – next page).

### Delirium forms

Because the motor activity of delirium patients during the hospitalisation were changed (it means that many of deceased patients with delirium preceding death became hypoactive), it was decided to estimate the motor activity during all the time of hospitalisation (predominant motor activity) and the motor activity immediately preceding (max 3 days) death (motor activity preceding death) ( $p < 0.001$ ) (table 2 – page 149).

### Duration of delirium

The duration of delirium differed from 1 to 1335 days (mean 74.7 days, SD 163.9, median 31.0 days). 2 dementia patients were observed: 1 male (74.3 years) and 1 female (97.4 years), who had the symptoms of delirium for 736 (2.01 years) and 1335 (3.65 years) days respectively. Some 12 patients (10 male and 2 female) had quite long delirium too: from 101 (0.28 years) to 536 (1.47 years) days. All these patients had dementia, were older than 74 years and did not abuse alcohol.

Due to retrospective research design it was impossible to assess the duration of delirium with regard to the severity of the somatic condition, however, the general

Table 1. Dead patients' characteristics

Characteristics	With delirium N (%)	Without delirium N (%)	p
<b>Generally</b>	103 (100)	20 (100)	---
<b>Age</b>			<0.001
0 – 39.9	0 (0)	2 (10)	---
40 – 59.9	7 (6.8)	4 (20)	---
60 – 79.9	58 (56.3)	14 (70)	---
80 – 99.9	38 (36.9)	0 (0)	---
<b>Sex</b>			<0.001
Women	28 (27.2)	14 (70)	---
Men	75 (72.8)	6(30)	---
<b>Marital status</b>			0.299
Married	54 (52.4)	8 (40)	---
Single (divorced, widowed)	44 (42.7)	11 (55)	---
Unknown	5 (4.9)	1 (5)	0.729
<b>Place of residence</b>			---
City	66 (64.1)	12 (60)	---
Country	37 (35.9)	8 (40)	0.092
<b>Alcohol abuse</b>			---
Yes	5 (4.9)	3 (15)	---
No	98 (95.1)	17 (85)	<0.001
<b>Dementia</b>			---
Yes	90 (87.4)	5 (25)	---
No	13 (12.6)	15(75)	<0.001
<b>Depression</b>			---
Yes	1 (1)	6 (30)	---
No	102 (99)	14 (70)	NC <sup>5</sup>
<b>Somatic disorders<sup>1,2</sup></b>			---
Heart and cardiovascular system	87 (84.5)	10 (50)	---
Brain vascular system (no stroke)	29 (28.2)	2 (10)	---
Heart stroke	2 (1.9)	0 (0)	---
Hypertension	25 (24.3)	2 (10)	---
Pulmonary	24 (23.3)	4 (20)	---
Genitourinary	7 (6.8)	1 (5)	---
Diabetics	5 (4.9)	0 (0)	---
Cancer (miscellaneous)	14 (13.6)	4 (20)	---
Brain injuries	6 (5.8)	0 (0)	---
Brain stroke	11 (10.7)		NC
<b>Psychiatric disorders<sup>3,4</sup></b>		1 (5)	---
Dementia in Alzheimer disease (F 00)	35 (29.7)	0 (0)	---
Vascular dementia (F 01)	46 (39)	4 (20)	---
Dementia in other diseases classified elsewhere/unspecified (F 02. F 03)	2 (1.7)	0 (0)	---
Delirium not superimposed on dementia (F 05.0)	12 (10.2)	–	---
Delirium not superimposed on dementia (F 05.1)	91 (77.1)	–	---
Delirium superimposed on dementia (F 05.1)	20 (16.9)	3 (15)	---
Dependence syndrome (F 10.2)	1 (0.8)	6 (30)	---
Schizophrenia (F 20)	5 (4.2)	1 (5)	---
Organic delusional [schizophrenia-like] disorder (F 06.2)	1 (0.8)	6 (30)	---
Organic mood [affective] disorders (F 06.3)	1 (0.8)	0 (0)	---
Dependence syndrome (F 11.2)	3 (2.5)	7 (35)	---
Other (F 33. 25. 07)			---

**Endnotes:** <sup>1</sup> Because in many cases more than one somatic disorder was present, the number of somatic disorders is higher than number of patients, <sup>2</sup> Somatic pathology was divided due to systems and specific disorders, <sup>3</sup> Because in many cases more than one psychiatric disorder was present, the number of psychiatric disorders is higher than number of patients <sup>4</sup> ICD-10, <sup>5</sup> Not calculated due to small number of cases

trend was observed that the shortest delirium manifested in the cases of acute disorders (miocardial infarction – 2 patients, 3 – 16 days, mean 9.5; stroke – 11 patients, 2 – 71 days, mean 23.82), and the longest – in the cases of chronic disorders (chronic cerebrovascular disease 29 patients, 2 – 736 days, mean 102.9).

Table 2. **Types of delirium**

Dominant motor activity	Number of cases	(%)
mixed	7	6.8
hyper	61	59.2
hypo	35	34.0
Generally	103	100.0
Motor activity preceding death		
mixed	11	10.7
hyper	11	10.7
hypo	81	78.6
Total	103	100.0

#### Impact of gender on the incidence and duration of delirium

During the research period the death rate of women was 2.2 less than that of men, whereas only 1.5 times fewer of them were hospitalised. Practically, the distribution under age among women and men was not different – respectively 54.7 to 97.4 years (mean 79.0) and 46.6 to 92.8 (mean 76.3)  $p=0.213$ , however, delirium was much frequently established among men (Table No 1).

Surprisingly, the incidence of delirium among non-dementia men was quite high (10 out of 14 [76.9%]), as compared to non-dementia women (3 out of 14 (23.1%),  $p=0.008$ ).

There were no major differences among dementia women and men in terms of age (respectively mean 79.5 years, SD 9.7 and 76.8 years, SD 9.1;  $p=0.206$ ), delirium incidence (respectively 65 (97.0%) and 25 (89.3%) out of 90;  $p=0.124$ ) and abuse of alcohol (respectively 3 (4.5%) and 1 (3.6%) out of 4;  $p=0.841$ ).

There were no major differences in terms of duration of delirium among men (mean 65.6 days, SD 107.7, median 31,0) and women (99.2 days, SD 262.4, median 31.5) ( $p=0.357$ ).

Impact of age and functional cognitive impairment level on the frequency and duration of delirium

The delirium patients were elder in age (mean 77.1 years, SD 6.6), when compared to the non-delirium ones (64.8 years, SD 14.0) ( $p<0.001$ ). The duration of delirium also depended on the age: elder patients tended to have longer delirium ( $r=0.249$ ;  $p=0.011$ ). With the aim to evaluate the duration of delirium more precisely in elder and younger patients, we divided the deceased patients into elder and younger than 75

year of age (cut on the median). For younger patients the average duration of delirium was shorter than that of the elder patients (respectively 52.6 days, SD 121.4 and 87.7 days, SD 183.9;  $p=0.019$ ).

Dementia patients tended to get delirium more frequently (table 1), whereas the duration of delirium among the dementia persons was longer than that among the non-dementia patients (respectively 83.6 days, SD 173.6 and 13.5, SD 11.6 [ $p<0.001$ ]).

## Discussion

This study was only retrospective due to two reasons. Firstly, the number of deaths in the psychiatric institution is relatively low [13]. Secondly, very often neither psychiatric nor somatic indicators show the ante-mortem condition of the patients in the psychiatry institution [14]. The results of the study have proved that delirium among the deceased at the psychiatric institutions is almost as frequent (83.7%), as among the terminal cancer patients and patients with terminal illness (up to 88%) [15, 16]. This results states that ante-mortem delirium manifests irrespectively of the somatic disorder origin. Other two results were surprising: it was hoped that in the group of the alcohol abuse the incidence of delirium will be more significant, since the previous studies established that elder patients with alcohol abuse problem tend to get delirium more often [17].

On the other hand, it was surprising that depressive patients were not inclined to delirium. Having established a negative depression and delirium link, the results of the previous studies, though not numerous, were different: that the depressive medical patients or those suffering of anxiety are more inclined to delirium [18-20]. Maybe, in our case it was significant that all depressive patients were treated? Also our empiric experience shows that depression among the elder manifests usually among more educated patients who have less marked disorder of cognitive functions and this might be the reason of not having delirium. Therefore, further studies of delirium should focus not only on the direct reason for development of delirium, but also on the education and mental condition before delirium of the patients.

Up till now the forms of ante-mortem delirium were rarely investigated and the results obtained were contradictory. Morita (2001) claims that the prognosis of cancer as lethal disease due to hypoactive delirium is poorer [21], whereas Marcantonio (2002) has established the opposite – those who experienced “poor” hypoactive delirium were better than those who experienced hyperactive or mixed [22]. Our study has showed that at the beginning of therapy hyperactive or mixed delirium was observed in patients, whereas just before death (1-3 days) many patients with hypoactive delirium were observed. We think that in some cases this motor active transformation might have been determined not only by worsening somatic condition but also by CNS inhibitory medications.

Up till now little is known about the duration of delirium. The data on the heterogeneity of delirium is quite controversial. Since the majority of studies were carried out in the non-psychiatric institutions, were more non-dementia patients are treated but those of critical condition, the durations of delirium were relatively short – from a few hours to a few weeks [23, 24]. Delirium lasts a bit longer among psychiatric patients where relatively healthier patients are treated: Koponen et al. have established

that the average duration of delirium in the psychiatry unit was 20 days (min 3 - max 81) [12]. The recent studies (McCusker and others) indicate that even in the medical wards, the delirium clinics among elder patients sometimes lasts for a year [25]. We have established that there were even 14 persons with delirium longer than 100 days, 4 out of them had delirium for longer than a year (from 459 to 1335 days).

We have established that the factors which determine the duration of delirium are the age and the disorder of cognitive functions. All 14 patients who had longer than 100 day delirium were elder and had dementia. This result complies with McCusker et al. study data which investigated the influence of delirium to mortality during the period of one year [26]. It was established that the patients with delirium and dementia lived longer than the patients with delirium without dementia. So, although the study (McCusker et al.) did not directly analyse the duration of delirium, one may assume that the delirium in dementia patients was longer [26]. We suppose that one of the reasons why younger and non-dementia patients died earlier from deliriums is that they had more severe, acute disorders with pain, which exhausted neuromediator systems and which required polypharmacotherapy and in such a way determined the development of delirium and other changes in the human body.

It was impossible to assess the influence of age and cognitive function status on the incidence of delirium separate, since older persons had dementia more frequently ( $r=0,507$ ;  $p<0,001$ ). We think that at least the incidence of delirium should be more related to the disorder level of cognitive functions rather than with the age, since there are studies which prove that elder non-dementia persons rarely get delirium [27], and chronological age in itself is not related to the risk of delirium [28].

## Conclusions

1. Ante-mortem delirium manifested more often in elderly and demented patients.
2. The duration of ante-mortem delirium was shorter in younger and non-dementia patients.
3. Patients of the psychiatric institution tend to have longer deliriums than medical patients.
4. The patients with depression and the history of alcohol abuse were less likely to get ante-mortem delirium.
5. In the majority of cases before death hyperactive and mixed delirium transformed into hypoactive delirium.

## Параметры предсмертного делирия

### Содержание

**Задание.** Заданием этого исследования было определение параметров предсмертного делирия в психиатрической больнице и их сравнение с предсмертной психопатологией соматических больных.

**Метод.** Анализ медицинской документации 139 пациентов психиатрической больницы умерших в 1997–2003 годах. Диагнозы были поставлены на основе показателей 10 пересмотра ИЦД по Международной классификации болезней. Подбор пациентов для исследования был

обусловлен следующими данными: возраст больного, пол, предшествующие психические нарушения: психическое и соматическое состояния и иные заболевания.

**Результаты.** У 83,7% пациентов был диагностирован предсмертный делирий, а основную группу составляли старые мужчины с симптомами деменции и меньшей склонностью к депрессии. Отмечено, что у пациентов без признаков деменции делирий присутствовал у 76,9% мужского пола и 23,1% женского пола ( $p=0,008$ ). Среди исследованных пациентов делирий от 1 до 1335 дней. Наблюдению подвергнут длительный делирий который появлялся у пациентов старших, 75 лет (87,7 СД 52,6 vs 183,9, СД 121,4 дней,  $p=0,019$ ) и больных с симптомами деменции (83,6, СД 173,6 vs 13,5, СД 11,6 дней  $p<0,001$ ), а зависимости между полами не отмечено.

**Выводы.** Предсмертный делирий чаще присутствовал у пациентов старшего возраста с симптомами деменции. У младших пациентов без симптомов деменции делирий продолжался коротко. Длительный делирий чаще наблюдался у пациентов в психиатрической больнице нежели у соматических больных. Для пациентов с симптомами депрессии и лиц в прошлом злоупотребляющих алкоголем появление симптомов предсмертного делирия атипично. Предсмертный делирий со средним и гиперактивным насилении вкратце перед смертью изменялся на мало активный

**Ключевые слова:** предсмертный делирий, умирающий больной, деменция

### Parameter von prämortalem Delirium

#### Zusammenfassung

**Ziel.** Das Ziel dieser Studie war die Bestimmung der prämortalen Parameter im psychiatrischen Krankenhaus und ihr Vergleich mit der prämortalen Psychopathologie der somatischen Patienten.

**Methode.** Die Analyse der medizinischen Dokumentation von 139 Patienten eines psychiatrischen Krankenhauses, die in den Jahren 1997 – 2003 gestorben sind. Die Diagnosen wurden nach den Anforderungen der 10 Version der Internationalen Klassifikation der Krankheiten (ICD-10) gestellt. Die Wahl der Patienten zu der Studie war wie folgend bedingt: Alter des Patienten, Geschlecht, frühere psychische Störungen, psychisches und somatisches Befinden und andere Krankheiten.

**Ergebnisse.** Bei 83,7% der Patienten wurde das prämortale Delirium diagnostiziert. Die größte Gruppe bildeten ältere Männer mit Symptomen der Demenz und einer niedrigeren Anfälligkeit für Depression. Es wurde nachgewiesen, dass bei den Patienten ohne Symptome einer Demenz das Delirium bei 76,9 des männlichen Geschlechts und 23,1% des weiblichen Geschlechts auftrat ( $P=0,0008$ ). Unter den untersuchten Patienten dauerte das Delirium von 1 Tag bis 1 335 Tagen. Das längere Delirium wurde auch beobachtet, es trat bei den Patienten über dem 75. Lebensjahr (87,7, SD 52,6 vs. 183,9, SD 121,4 Tage,  $p=0,019$ ) und Patienten mit Symptomen einer Demenz auf (83,6, SD 173,6 vs. 13,5, SD 11,6 Tage,  $p<0,001$ ). Die Abhängigkeiten zwischen den Geschlechtern wurden nicht nachgewiesen.

**Schlussfolgerungen.** Das prämortale Delirium trat am häufigsten bei den Patienten im hohen Alter mit Symptomen einer Demenz auf. Bei den jüngeren Patienten ohne Demenzsymptome dauerte das Delirium kürzer. Ein längeres Delirium trat häufiger bei Patienten im psychiatrischen Krankenhaus auf als bei den somatischen Patienten. Für Patienten mit Symptomen der Depression und bei Personen, die Alkohol missbrauchen, sind die Symptome des prämortalen Deliriums nicht typisch. Das prämortale Delirium von mittlerer und hypoaktiver Intensität veränderte sich kurz vor dem Tode in das wenig aktive.

**Schlüsselwörter:** prämortales Delirium, sterbender Patient, Demenz

### Les paramètres du délire ante mortem

#### Résumé

**Objectif.** Définir les paramètres du délire ante mortem des patients psychiatriques hospitalisés et les comparer avec la psychopathologie des patients somatiques.

**Méthode.** On analyse les documentations médicales de 139 patients psychiatriques hospitalisés, morts dans les années 1997-2003. Ils sont diagnostiqués d'après les critères d'ICD-10. Les données des patients contiennent : âge, sexe, troubles mentaux, état mental et somatique, d'autres maladies.

**Résultats.** 83,7% de patients (la plupart ce sont les hommes avec la démence et les tendances à la dépression) ont le délire ante mortem. Chez les patients sans démence le délire ante mortem est présent chez 76,9% d'hommes et 23,1% de femmes ( $p=0,008$ ). Ce délire ante mortem dure 1-1335 jours. On analyse avant tout le délire plus long des patients ayant plus de 75 ans (87,7, SD 52,6 vs 183,9, SD 121,4 jours,  $p=0,019$ ) et des patients avec les symptômes de la démence (83,6, SD 173,6 vs 13,5, SD 11,6 jours,  $p<0,001$ ) ; les corrélations avec le sexe ne sont pas observées.

**Conclusions.** Le délire ante mortem est présent plus souvent chez les patients plus âgés, avec les symptômes de la démence. Chez les patients sans démence le délire ante mortem est plus court. Le délire ante mortem dure plus longtemps chez les patients psychiatriques que chez les patients somatiques. Chez les patients avec les symptômes dépressifs et chez les alcooliques les symptômes du délire ne sont pas typiques. Le délire ante mortem d'intensité moyenne et hyperactive devient peu actif.

**Mots clés :** délire ante mortem, patient mourant, démence

## References

1. Banh HL. *Management of delirium in adult critically ill patients: an overview*. J. Pharm. Pharm. Sci. 2012; 15(4): 499–509.
2. McAiney CA, Patterson C, Coker E, Pizzacalla A. *A quality assurance study to assess the one-day prevalence of delirium in elderly hospitalized patients*. Can. Geriatr. J. 2012; 15(1): 2–7.
3. Harris D. *Delirium in advanced disease*. Postgrad. Med. J. 2007; 83(982): 525–528.
4. Ferris FD, von Gunten CF, Emanuel LL. *Ensuring competency in end-of-life care: controlling symptoms*. BMC Palliat. Care 2002; 1(1): 5.
5. Bobińska K, Wierzbiński P, Kuśmierk M, Florkowski A, Szubert S. *Delirium- not only psychiatric issue*. Pol. Merkur. Lek. 2008; 24(140): 166–169.
6. Gaudreau JD, Gagnon P, Roy MA, Harel F, Tremblay A. *Opioid medications and longitudinal risk of delirium in hospitalized cancer patients*. Cancer 2007; 109(11): 2365–2373.
7. Fang CK, Chen HW, Liu SI, Lin CJ, Tsai LY, Lai YL. *Prevalence, detection and treatment of delirium in terminal cancer inpatients: a prospective survey*. Jpn. J. Clin. Oncol. 2008; 38(1): 56–63.
8. Ogawa A, Shimizu K, Akizuki N, Uchitomi Y. *Involvement of a psychiatric consultation service in a palliative care team at the Japanese cancer center hospital*. Jpn. J. Clin. Oncol. 2010; 40(12): 1139–1146.
9. Scarpi E, Maltoni M, Miceli R, Mariani L, Caraceni A, Amadori D i wsp. *Survival prediction for terminally ill cancer patients: revision of the palliative prognostic score with incorporation of delirium*. Oncologist 2011; 16(12): 1793–1799.
10. Rao S, Ferris F, Irwin SA. *Ease of screening for depression and delirium in patients enrolled in inpatient hospice care*. J. Palliat. Med. 2011; 14(3): 275–279.
11. Tada Y, Matsubara M, Kawada S, Ishida M, Wada M, Wada T i wsp. *Psychiatric disorders in cancer patients at a university hospital in Japan: descriptive analysis of 765 psychiatric referrals*. Jpn. J. Clin. Oncol. 2012; 42(3): 183–188.
12. Koponen H, Stenback U, Mattila E, Soininen H, Reinikainen K, Riekkinen PJ. *Delirium in elderly persons admitted to a psychiatric hospital: clinical course during the acute stage and one-year follow-up*. Acta Psychiatr. Scand. 1989; 79(6): 579–585.
13. Patten SB, Williams JV, Haynes L, McCrudden J, Arboleda-Flórez J. *The incidence of delirium in psychiatric inpatients units*. Can. J. Psychiatry 1997; 42(8): 858–863.

14. Aranauskas R, Deksnyte A, Dembinskas A. *Delirium as the most common antemortem psychiatric disorder: a 7-year experience at an inpatient psychiatric institution*. Acta Med. Lituanica 2004; 11(4): 48–54.
15. Keeley PW. *Delirium at the end of life*. Clin. Evid. (Online) 2007; 2007: 2405.
16. Michaud L, Burnand B, Stiefel F. *Taking care of the terminally ill cancer patient: delirium as a symptom of terminal disease*. Ann. Oncol. 2004; 15(supl. 4): iv199–iv203.
17. Onen SH, Onen F, Mangeon JP, Abidi H, Courpron P, Schmidt J. *Alcohol abuse and dependence in elderly emergency department patients*. Arch. Gerontol. Geriatr. 2005; 41(2): 191–200.
18. Pompei P, Foreman M, Rudberg MA, Inouye SK, Braund V, Cassel CK. *Delirium in hospitalized older persons: Outcomes and predictors*. J. Am. Geriatr. Soc. 1994; 42(8): 809–815.
19. Minden SL, Carbone LA, Barsky A, Borus JF, Fife A, Fricchione GL i wsp. *Predictors and outcomes of delirium*. Gen. Hosp. Psychiatry 2005; 2(3): 209–214.
20. Leung JM, Sands LP, Mullen EA, Wang Y, Vaurio R. *Are preoperative depressive symptoms associated with postoperative delirium in geriatric surgical patients?* J. Gerontol. A Biol. Sci. Med. Sci. 2005; 60(12): 1563–1568.
21. Morita T, Tei Y, Tsunoda J, Inoue S, Chihara S. *Underlying pathologies and their associations with clinical features in terminal delirium of cancer patients*. J. Pain Symptom Manage 2001; 22(6): 997–1006.
22. Marcantonio E, Ta T, Duthie E, Resnick NM. *Delirium severity and psychomotor types: their relationship with outcomes after hip fracture repair*. J. Am. Geriatr. Soc. 2002; 50(5): 850–857.
23. Morita T, Tei Y, Inouye S. *Impaired communication capacity and agitated delirium in the final week of terminally ill cancer patients: prevalence and identification of research focus*. J. Pain Symptom Manage 2003; 26(3): 827–834.
24. Manos PJ, Wu R. *The duration of delirium in medical and postoperative patients referred for psychiatric consultation*. Am. Clin. Psychiatry 1997; 9(4): 219–226.
25. McCusker J, Cole M, Dendukuri N, Han L, Belzile E. *The course of delirium in older medical inpatients: a prospective study*. J. Gen. Intern. Med. 2003; 18(9): 696–704.
26. McCusker J, Cole M, Abrahamowicz M, Primeau F, Belzile E. *Delirium predicts 12-months mortality*. Arch Intern Med. 2002; 162(4): 457–463.
27. Kagansky N, Rimon E, Naor S, Dvornikov E, Cojocar L, Levy S. *Low incidence of delirium in very old patients after surgery for hip fractures*. Am. J. Geriatr. Psychiatry 2004; 12(3): 306–314.
28. Robertsson B, Blennow K, Gottfries CG, Wallin A. *Delirium in dementia*. Int. J. Geriatr. Psychiatry 1998; 13(1): 49–56.

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