Original Article

Concordance between the DSM-IV and the DSM-5 Criteria for Delirium Diagnosis Referred to the Consultation-Liaison Psychiatry Unit at a University Hospital in Bangkok, Thailand

Sunanta Chantakarn MD, PhD, MPE[1], Dheeravut Ratanapichayachai MD[2], Sirirat Kooptiwoot MD[1], Nattha Saisavoey MD[1]

[1] Department of Psychiatry, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
[2] Rajavithi Hospital, Bangkok, Thailand

Objective: The present study investigated concordance between DSM-IV and DSM-5 criteria for delirium diagnosis referred to a consultation-liaison psychiatry unit at a University Hospital in Bangkok, Thailand.

Materials and Methods: A retrospective chart review was conducted on delirium patients who were consulted to the psychiatric consultation-liaison unit of the hospital form September 2013 to June 2015.

Results: Delirium was found in 252 subjects, most were male in age >65 years old. Using DSM-IV Criteria, 177 cases (70.2%) were identified as delirium. Using Strict DSM-5 criteria, 163 cases (64.7%) were identified as delirium. Furthermore, using Relaxed DSM-5 criteria, 200 cases (79.4%) were identified as delirium. There were 163 cases (64.7%) were identified as delirium by all three approaches. The concordance between the different diagnostic methods was: 95% (K = 0.89) between DSM-IV and the strict DSM-5, 91% (K = 0.75) between the DSM-IV and relaxed DSM-5 criteria and 86% (K = 0.66) between the strict versus relaxed DSM-5 criteria.

Conclusion: Degree of concordance in the present study is at a good level.

Keywords: Delirium, Classification, Diagnosis, Criteria, Neurocognitive disorder

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Delirium is a syndrome of acute brain dysfunction caused by sudden physical disorders that subsequently resulted in a state of confusion; characterized by abnormalities of perceptions including disorientation to time, place, and persons[1]. The symptoms fluctuated during the day, and usually recovered within a few days[2]. Additional symptoms included state of illusions, poor self-control, and irritability. Symptoms of delirium is treatable but if left untreated could be dangerous, and in some instances life-threatening[1,3-5].

Correspondence to:
Saisavoey N, Department of Psychiatry Faculty of Medicine Siriraj Hospital Mahidol University, Wanglang, Bangkoknoi, Bangkok 10700, Thailand.
Phone: +66-2-4197000 ext. 4293
E-mail: nattha.sai@mahidol.edu

In 1980, the American Psychiatric Association [APA] issued standardized criteria for diagnosing delirium for the first time in the Diagnostic and Statistical Manual of Mental disorders, third edition [DSM-III][6] followed by the revised edition, the Diagnostic and Statistical Manual third edition revised [DSM-III-R] in 1987[7] and the Diagnostic and Statistical Manual, fourth edition [DSM-IV] in 1994[8], respectively. In particular, the DSM-IV criteria played a crucial role in advancement of delirium researches[9]. The criteria in the DSM-IV were well explained; the delirium syndrome was familiar to both clinicians and researchers[10]. The principal criteria had been identified and encapsulated over the years[11].

In the latest revision of the Diagnostic and Statistical Manual of Mental Disorders [DSM-5][12] the criteria in the DSM-IV in combination with new

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researches resulted in the update. Although no modification had been made to the main criteria, the updated information and expanded explanations of delirium conditions improved diagnostic criteria (Table 1) and increased the accuracy of diagnosis[13]. Previous studies found discrepancies in different versions of the criteria[14-19] which thus emphasized the difference and its affects in explanations used in the DSM-5. Therefore, the criteria of the DSM-IV and the DSM-5 extenuating effects are investigated in its application in psychiatric consultation of department of psychiatry in a university hospital, in Bangkok, Thailand. Concordance and discrepancies between the DSM-IV and the DSM-5 were essential in data collection and future researches.

Materials and Methods

The study was conducted using data collected routinely for psychiatric consultation-liaison services, department of psychiatry in a 2,062 bed-teaching hospital in Bangkok. The patients had to be at least 18 years old, referred to consultation-liaison services in psychiatric department, and had been diagnosed as delirium by a psychiatrist from department of psychiatry. The retrospective data were collected from 1 September 2013 to 30 June 2015. This study was approved by Siriraj Institution Review Board.

The initial diagnosis was conducted by psychiatric medical residents and other medical residents on duty at consultation-liaison unit. The diagnosis was confirmed by the multidisciplinary medical team led by the psychiatric medical staffs from department of psychiatry.

Selection criteria

Inclusion criteria

1) The patients were referred from other departments and had been diagnosed as delirium by a psychiatrist from department of psychiatry.

2) Had to be at least 18 years of age.

3) There were no age, gender, levels of education, religion, or socioeconomic status restrictions.

Exclusion criteria

1) No documented delirium diagnosis or incomplete record of diagnosis.

Sample

There had been no previous researches available regarding the concordant of delirium diagnosis in Thailand. Therefore, the patients were selected, if diagnosed with the International Classification of Diseases 10th Revision (ICD-10) code, which were F05.X and F1X.4 (F05.X: Delirium, not induced by alcohol and other psychoactive substances;

Table 1. The comparison between delirium criteria of the DSM-IV and the DSM-5

DSM-5	DSM-IV
A. A disturbance in attention (i.e., reduced ability to direct, focus, sustain, and shift attention) and awareness (reduced orientation to the environment)	A. Disturbance of consciousness (i.e., reduced clarity of awareness of the environment) with reduced ability to focus, sustain or shift attention
B. The disturbance develops over a short period of time (usually hours to a few days), represents a change from baseline attention and awareness, and tends to fluctuate in severity during the course of a day	C. The disturbance develops over a short period of time (usually hours to days) and tends to fluctuate during the course of the day
C. An additional disturbance in cognition (e.g. memory deficit, disorientation, language, visuospatial ability, or perception)	B. A change in cognition or the development of a perceptual disturbance that is not betteraccounted for by a pre-existing, established or evolving dementia
D. The disturbances in Criteria A and C are not better explained by a pre-existing, established orevolving neurocognitive disorder and do not occur in the context of a severely reduced level of arousal, such as coma	
E. There is evidence from the history, physical examination or laboratory findings that the disturbance is a direct physiological consequenceof another medical condition, substanceintoxication or withdrawal, or exposure to a toxin, or is due to multiple etiologies	D. There is evidence from the history, physical examination or laboratory findings that the disturbance is caused by the direct physiological consequences of a general medical condition

F1X.4: Mental and behavioral disorders due to use of substance, withdrawal state with delirium). The percent accuracy between the DSM-IV and the DSM-5 was set at approximately 53%, following the research of David J Meagher et al[13], with a margin of error at 0.07, and type I error = 0.05. The sample size of 196 patients was calculated.

The researchers had categorized the patients into two groups which were the DSM-5 strict criteria and relaxed criteria as modeled by David J Meagher et al[13] in 2014 (Table 2).

Ethical consideration

This study was approved by Siriraj Institutional Review Board [SIRB] COA No. 243/2558 (EC1).

Results

From the reports of referred patients from other departments for psychiatric consultation-liaison services, dated 1 September 2013 to 30 June 2015, the total number was 1,561 patients. In total, 359 patients or about 23% were diagnosed with delirium but only 252 patients (approximately 70.2% of delirium patients) had sufficient information and documentation.

The male population made up the majority of the patients at 65.1% and most patients were at least 65 years of age, or approximately 59.1%. Age varied from 18 to 96 years with mean (SD) of 66.3 (15.6).

The concordant of delirium diagnosis between DSM-IV and DSM-5

The study revealed that 177 patients were diagnosed with delirium by DSM-IV (70.2%), 163 patients by strict DSM-5 criteria (64.7%), and 200 patients according to relaxed DSM-5 criteria (79.4%) as illustrated in Figure 1.

In total, 163 patients were diagnosed as delirium by all 3 guidelines and 14 patients were not diagnosed according to the strict DSM-5. Twelve patients were diagnosed according to the DSM-IV and relaxed the DSM-5 criteria. Only 2 patients were diagnosed according to the guideline of the DSM-IV, and no diagnosis had been given under the guideline of the DSM-5. The relaxed DSM-5 criteria alone diagnosed 25 patients.

The concordance between the diagnostic criteria of the DSM-IV and the DSM-5 was analyzed by Kappa statistic in Table 3 as followed:

From Table 3, the concordance between the DSM-IV and the strict DSM-5 criteria was at 95% (K = 0.89), the concordance between the DSM-IV and the

Table 2. The comparison between DSM-5 strict and relaxed criteria

DSM-5 criteria	Application of criteria	
	Strict	Relaxed
Criterion A	✓	
A disturbance in attention and awareness with reduced orientation to the environment	✓	
Criterion B	✓	Either
The disturbance develops over a short period of time (usually hours to a few days) represents a change from baseline attention and awareness, and tends to fluctuate in severity during the course of a day	✓	
Criterion C	✓	✓
An additional disturbance in cognition (e.g. memory deficit, disorientation, language, visuospatial ability, or perception)		
Criterion D		
The disturbances in Criteria A and C are not better explained by a pre-existing, established or evolving neurocognitive disorder and do not occur in the context of a severely reduced level of arousal, such as coma	✓	✓
Criterion E		
There is evidence from the history, physical examination or laboratory findings that the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal, or exposure to a toxin, or is due to multiple etiologies	✓	✓

relaxed DSM-5 criteria were at 91% (K = 0.75), and the concordance between the strict DSM-5 criteria and the relaxed DSM-5 were at 86% (K = 0.66).

Criteria for delirium diagnosis

The evaluation of the criteria for delirium diagnosis revealed principle criteria as illustrated in Table 4 as follows:

Table 4 demonstrated the disturbance of consciousness, disturbance of attention scored the highest at 80.2% of the studied population, followed by awareness at 75.8%, and level of consciousness at 30.2%.

In delirium patients diagnosed by both the DSM-IV and the strict DSM-5, level of consciousness was affected in 100% of the population followed by the relaxed DSM-5 criteria at 88.1%.

In delirium patients diagnosed by the DSM-IV, 37.3% were found to have criteria that affected levels of consciousness, in the relaxed DSM-5 at 32.8%, and in the strict DSM-5 at 31.9%.

In delirium patients who were diagnosed by the strict DSM-5 criteria, effected awareness was found at 99.4%, the DSM-IV at 91.5%, and the relaxed DSM-5 at 80.6%.

There were 14 delirium patients who were diagnosed with the DSM-IV but not by the DSM-5 equivalent to 5.6%.

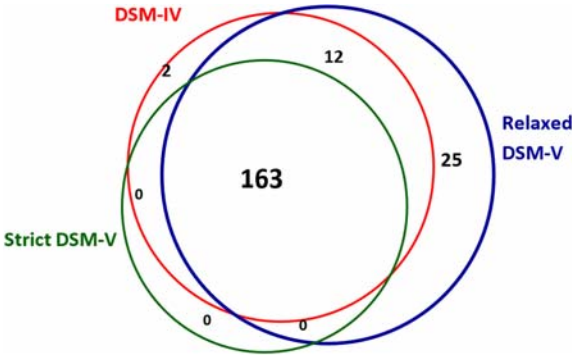

Figure 1. The concordant between delirium diagnosis of DSM-IV, strict DSM-5, and relaxed DSM-5.

Discussion

This study found that the concordance between the diagnostic criteria of delirium in the DSM-IV and the DSM-5 considered high, with Kappa = 0.89[22] and supported the report of Esteban Sepulveda et al[20]. However, it interjected evidences of David J Meagher et al[13] and Dimitrios Adamis et al[21].

The evidences found by Esteban Sepulveda et al[20] contained similarities in gender of the population; those were mostly male with whom direct in person interviews were conducted. The interview followed a systematic checklist and the results were analyzed one by one reflected in the current study. However, the current research methods differed from Esteban Sepulveda et al[20] due to the use of retrospective chart review while Esteban Sepulveda et al conducted a prospective cross-sectional study.

David J Meagher et al in 2014[13] conducted a retrospective study in the majority of old age male

Table 3. The concordance analysis of delirium according to DSM-IV and DSM-5

Authors	% observed agreement (Kappa)		
	DSM-IV, Strict DSM-V	DSM-IV, Relaxed DSM-V	Strict DSM-V, Relaxed
DSM-V			
Current research	95 (0.89)	91 (0.75)	86 (0.66)
Meagher et al.	53 (0.22)	91 (0.82)	60 (0.29)
Meagher et al.[a]	48 (0.19)	94 (0.85)	55 (0.25)
Meagher et al.[b]	56 (0.16)	94 (0.87)	57 (0.17)
Meagher et al.[c]	55 (0.23)	86 (0.66)	69 (0.43)
Esteban Sepulveda et al.[d]	98 (0.93)	-	-
Dimitrios Adamis et al.[e]	82 (0.33)	-	-

* Probability of agreement, ** Degree of agreement.

[a] = Research by Meagher et al[13] in palliative care patients; [b] = Research by Meagher et al[13] in general hospital patients; [c] = Research by Meagher et al[13] in first psychiatric visit of later life patients; [d] = Calculated from the original data of Esteban Sepulveda et al[20]; [e] = Calculated from the original data of Dimitrios Adamis et al[21]

Table 4. The concordance of delirium diagnosis between DSM-IV and DSM-5

Diagnostic Criteria	Total population (n = 252)	Delirium criteria of DSM-IV (n = 177)	Delirium criteria of DSM-5 (Strict criteria) (n = 163)	Delirium criteria of DSM-5 (Relaxed criteria) (n = 200)	Delirium criteria of DSM IV did not qualify in Strict DSM 5 (n = 14)
Criteria A					
Disturbance of consciousness	208 (82.5%)	177 (100%)	163 (100%)	177 (88.5%)	14 (100%)
Level of consciousness[a]	76 (30.2%)	66 (37.3%)	52 (31.9%)	66 (33%)	14 (100%)
Awareness[b]	191 (75.8%)	162 (91.5%)	162 (99.4%)	162 (81%)	0 (0%)
Disturbance of attention	202 (80.2%)	177 (100%)	163 (100%)	200 (100%)	14 (100%)
Criteria B in DSM 5/ Criteria C in DSM IV					
Acute onset	252 (100%)	177 (100%)	163 (100%)	200 (100%)	14 (100%)
Fluctuation	252 (100%)	177 (100%)	163 (100%)	200 (100%)	14 (100%)
Criteria C in DSM 5/ Criteria B in DSM IV					
Disturbance of cognition	252 (100%)	177 (100%)	163 (100%)	200 (100%)	14 (100%)
Criteria D in DSM 5					
Not better accounted for by Neurocognitive disorder	252 (100%)	177 (100%)	163 (100%)	200 (100%)	14 (100%)
Not Coma	252 (100%)	177 (100%)	163 (100%)	200 (100%)	14 (100%)
Criteria C in DSM IV-TR					
Not better accounted for by dementia	252 (100%)	177 (100%)	163 (100%)	200 (100%)	14 (100%)
Criteria E in DSM 5/ Criteria D in DSM IV					
Organic/Substance/Medical cause of delirium	252 (100%)	177 (100%)	163 (100%)	200 (100%)	14 (100%)

[a] Total number = 236, [b] total number = 248

population that paralleled the current study but the results, however, were contradictory. Meagher et al applied pooled database of 768 patients who were diagnosed by the DSM-IV and the DSM-5 before being evaluated with delirium rating scale-revised-98. The concordance was found at only 53%. If some criteria in the DSM-5 were revised to be more relaxed then the concordance rose to 91%[13]. In their study, the interviews with the patients were not conducted by a physician, which may have affected the interpretation of the diagnosis. Furthermore, not all the criteria were included for analysis in the research. From the total 355 patients who were diagnosed under the DSM-IV but not the DSM-5, 254 of them did not fit the criteria of acute onset and fluctuation, which was approximately 72%. In addition, 83 patients did not have evidence that showed abnormalities in attention and awareness (orientation), approximately 23%. Hence, the contradictory results may be explained for this reason regardless of different groups of population in the experiment. The concordance between the DSM-IV and the DSM-5 remained low, and resulted in the establishment of the relaxed DSM-5 criteria to increase the concordance percentage.

Dimitrios Adamis et al[21] also conducted the experiment on mostly male population who were hospitalized for physical illness. The subjects obtained a direct in person interview as well as being analyzed by all the diagnostic criteria. However, the result showed discordance with this study.

Furthermore, this current study found that the relaxed DSM-5 criteria illustrated highest flexibility in diagnosing delirium, followed by the DSM-IV, and the strict DSM-5, respectively. The more elaborated the criteria, the less likely a diagnosis with a condition.

Diagnostic criteria for delirium

The abnormalities found at consciousness level were attributed to abnormalities of awareness more than abnormal levels of consciousness which supported criteria A of the DSM-5. However, abnormalities at consciousness levels and abnormal sense of awareness differs in meaning in the DSM-IV and resulted in 14 patients who did not fit criteria for delirium in the strict DSM-5 criteria. Moreover, there were 2 patients who were diagnosed with delirium solely on the DSM-IV which made up 5.6% and 0.4%, respectively. As their levels of consciousness were abnormal but their awareness was identified in normal range, they were not treated as delirium patients.

The strengths of this research is that it is a pilot study for Thailand to investigate the concordance for delirium diagnosis in the DSM-IV and the DSM-5 and collected data from routine interviews of referred psychiatric consultation-liaison cases of department of psychiatry in a university hospital in Thailand.

The limitations of this study are as followed: 1) it was a retrospective study, therefore, some parts of the records contained missing data thus insufficient information for the study. 2) Some information was excluded due to high abnormalities of levels of consciousness and thus was not possible to assess the patient's attention, cognition, or other related factors which may cause selection bias. 3) The population was based on patients in a university hospital; consequently, the interpretation of the results must be viewed with caution and may be liable to generalizability.

This research sustenance credibility of the DSM-5 diagnosis emphasized possible gaps that may have overlooked some patients from the changes in the revisions. For further studies, the researchers recommends a commencement of a prospective study and use of measurement tools such as the Confusion Assessment Method [CAM] and the Delirium rating scale [DRS] Thai version[23-25].

What is already known on this topic?

The previous studies found discrepancies in different versions of the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria for delirium.

What this study adds?

The degree of concordance between the different delirium diagnostic methods applying different versions of the DSM criteria is at a good level.

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Potential conflicts of interest

None.

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