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Research article

Frequency and risk factors for subsyndromal delirium in an intensive care unit

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ABSTRACT

Objective: Delirium and subsyndromal delirium in critically ill patients are important determinants of long-term functional disability and cognitive impairment. However, few outcome studies on sub-syndromal delirium have been reported. Thus, this study aimed to evaluate the incidence of delirium and sub-syndromal delirium as well as the risk factors and progression to delirium.
Design: A prospective cohort study.
Setting: Six bed medical and surgical intensive care unit in Otsu Municipal Hospital in Japan.
Methods: Delirium and sub syndromal delirium were evaluated using the Intensive Care Delirium Screening Checklist scores and the demographic data of the patients recorded. Statistical analyses were conducted using the Mann–Whitney *U* test and chi-square test for comparison. We also compared groups using multivariate analyses.
Results: Of the 380 patients who were screened, 15.8% and 33.9% had delirium or sub syndromal delirium, respectively and 9.5% of patients progressed from a state of sub syndromal delirium to delirium. Older age, predisposing cognitive impairment, blood transfusion, higher Acute Physiology and Chronic Health Evaluation II (APACHE II) score, low red blood cell count and high C-reactive protein levels were the risk factors highly associated with subsyndromal delirium symptoms. Older age, acute admission, steroid use, the utilisation of restraints and lower PaO_2 were the determinants of progression to delirium.
Conclusions: A high incidence of sub syndromal delirium was observed in critically ill patients. Patient with sub syndromal delirium must be promptly identified and treated due to the risk of progression to delirium.
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Implications for Clinical Practice

- Older age, predisposing cognitive impairment, blood transfusion, higher Acute Physiology and Chronic Health Evaluation II score, low red blood cell count and high C-reactive protein levels were the risk factors highly associated with sub syndromal delirium symptoms.
- Older age, acute admission, steroid use, the utilisation of restraints and low PaO_2 were the determinants of progression to delirium.
- A high incidence was observed in critically ill patients. Patients with sub syndromal delirium must be promptly identified and treated due to the risk of progression to delirium.
- The risk of sub syndromal delirium and delirium in the intensive care unit may be reduced by improving the quality of care provided by the nursing staff to critically ill patients.

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Introduction

Recently, in the intensive care unit (ICU), the need to focus not only on lifesaving measures but also on the patient's quality of life (QOL) after ICU discharge has been suggested. Delirium, a condition with no established treatment, is a common and serious complication that aggravates patient outcome and post-ICU QOL (Needham et al., 2012). At present, prevention is the only technique used to deal with delirium and several ICU interventions have been tested, including environmental conditioning, sleep support and reduction in physical stress. However, no definitive conclusions have been obtained.

Delirium is defined as a slight or moderate conscious opacity along with cognitive impairment, such as disorientation, memory impairment, disorganised thinking, agitation, delusions, anxiety, hallucinations and perceptual and motor disturbances (American Psychiatric Association, 2000). This condition is an acute cognitive functional disorder and is caused by multiple organ failure associated with post-discharge adverse outcomes, such as mortality, dementia and prolonged hospital admissions (Witlox et al., 2010). Subsyndromal delirium (SSD) is characterised by a milder state of delirium (Cole et al., 2013), including one or more symptoms of delirium, without the full syndrome (Kiely et al., 2003). However, whether SSD may progress to delirium and its intervention will prevent the development of delirium remains unknown. Both delirium and SSD in the ICU are recognised as determinants for long-term functional disability and cognitive impairment, although few studies on SSD outcomes have been reported (Ely et al., 2004; Pandharipande et al., 2013; Yamaguchi et al., 2014). The incidence rates of delirium and SSD have been based on previous studies involving various patient groups in different hospital units (e.g., general ICU, surgical ICU, emergency ICU, coronary care unit, geriatric medicine and palliative care). Therefore, a more definitive incidence rate in a general hospital must be validated. Moreover, the knowledge of SSD symptoms may help in better understanding the clinical significance and diagnosis of SSD. In this study, we have focused on SSD in the ICU, the risk factors of SSD, the progression of SSD to delirium, and the relationship between SSD and delirium, with an intention to control risk factors and consequently prevent the development of delirium in ICU patients.

Method

Patients

Adult patients admitted to the ICU of Otsu Municipal Hospital in Japan for more than 12 hours were recruited between 1 April 2016 and 31 October 2016. This tertiary referral hospital with 441 beds serves a population of 560,000 people and is located in Otsu City, Shiga Prefecture, Japan. Their surgical and medical ICU has a six bed capacity. Patients under 20 years of age; those in deep coma, as determined using the Japan Coma Scale (JCS; score of 100–300) (Yagi et al., 2013) and those who were deeply sedated, as determined using the Richmond Agitation Sedation Scale (RASS; score of −4 and −5) (Ely et al., 2003) were excluded.

Demographic data of the patients and risk factors of SSD

The present study aimed at identifying the frequency of delirium and SSD in the ICU. Trained ICU nursing staff prospectively screened all patients every 8 hours using the Intensive Care Delirium Screening Checklist (ICDSC) (Bergeron et al., 2001), which is used to evaluate consciousness level, disorientation, inattention, psychomotor activity, hallucinations, and speech or mood disturbances. All ICU bedside nurses were trained based on specialised training programs. We used the ICDSC scores 1–3 out of 8 for SSD and 4–8 for delirium (Bergeron et al., 2001) with a sensitivity of 99% and a specificity of 64% for inter-observer reliability among the nursing staff and physicians (Bergeron et al., 2001). The nursing staff enrolled patients and recorded their demographic data throughout their stay in the ICU. The demographic data included

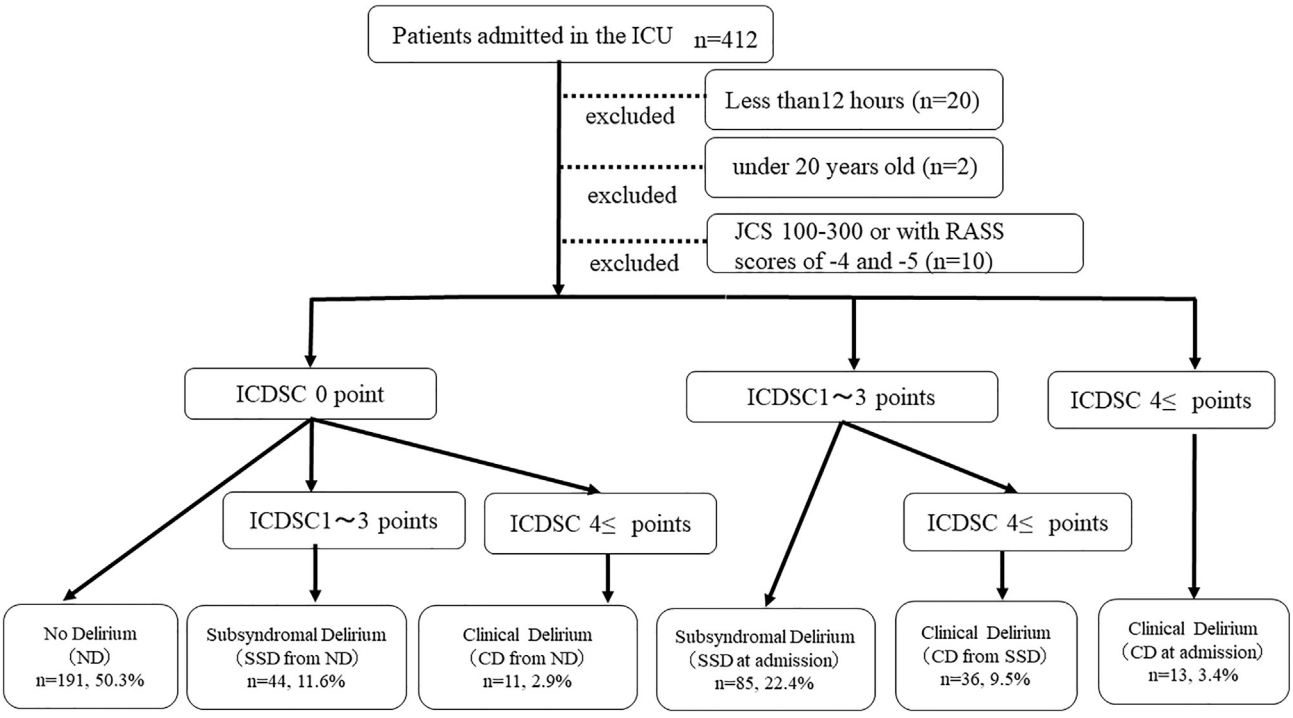

Fig. 1. Diagram of patient flow in the study. CD: Clinical delirium, ICDSC: Intensive Care Delirium Screening Checklist, ICU: Intensive Care Unit, JCS: Japan Coma Scale, ND: Non-delirium, RASS: Richmond Agitation Sedation Scale, SSD: subsyndromal delirium.

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