



ORIGINAL

Effect of the timing of admission upon patient prognosis in the Intensive Care Unit: On-hours versus off-hours[☆]



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KEYWORDS

Early diagnosis;
Decision support techniques;
Hospital rapid response team;
Outcome;
Critical care;
Time admission

Abstract

Objective: To assess the repercussion of the timing of admission to the ICU upon patient prognosis.

Design: A prospective, observational, non-interventional cohort study was carried out.

Scope: A second level hospital with 210 operational beds and a general ICU with 8 operational beds.

Patients or participants: The study comprised all patients admitted to the ICU during 3 years (January 2010 to December 2012), excluding those subjects admitted from the operating room after scheduled surgery. The patients were divided into 2 groups according to the timing of admission (on-hours or off-hours).

Interventions: Non-interventional study.

Variables of interest: An analysis was made of demographic variables (age, sex), origin (emergency room, hospital ward, operating room), comorbidities and SAPS 3 as severity score upon admission, length of stay in the ICU and hospital ward, and ICU and hospital mortality.

Results: A total of 504 patients were included in the on-hours group, versus 602 in the off-hours group. Multivariate analysis showed the factors independently associated to hospital mortality to be SAPS 3 (OR 1.10; 95%CI 1.08–1.12), and off-hours admission (OR 2.00; 95%CI 1.20–3.33). In a subgroup analysis of the off-hours group, the admission of patients on weekends or non-working days compared to daily night shifts was found to be independently associated to hospital mortality (OR 2.30; 95%CI 1.23–4.30).

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Conclusions: Admission to the ICU in off-hours is independently associated to patient mortality, which is also higher in patients admitted on weekends and non-working days compared to the daily night shifts.

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PALABRAS CLAVE

Diagnóstico precoz;
Herramientas de
decisión clínica;
Equipos de respuesta
rápida;
Pronóstico;
Cuidados críticos;
Momento de ingreso

Efecto del momento de ingreso sobre el pronóstico de los pacientes en la Unidad de Cuidados Intensivos: *on-hours* vs. *off-hours*

Resumen

Objetivo: Evaluar la repercusión del momento de ingreso en UCI sobre el pronóstico de los pacientes.

Diseño: Estudio de cohorte prospectivo, observacional y no intervencionista. Se consideró *on-hours* el turno de mañana y tarde de los días laborables y *off-hours* el resto de los turnos.

Ámbito: Hospital de nivel 2 con 210 camas en funcionamiento y UCI polivalente con 8 camas.

Pacientes o participantes: Todos los pacientes que ingresaron en la UCI durante 3 años, de enero de 2010 a diciembre de 2012, excluyendo aquellos pacientes procedentes de quirófano tras una cirugía programada. Los pacientes se estratificaron en 2 grupos en función de que el momento de ingreso fuera *on-hours* u *off-hours*.

Intervenciones: Estudio no intervencionista.

Variables de interés: Se analizaron las variables demográficas (edad, sexo), la procedencia (urgencias, planta de hospitalización, quirófano), el tipo de paciente (médico, quirúrgico), las comorbilidades y el SAPS 3 como puntuación de gravedad al ingreso, estancia en UCI y hospitalaria, además de mortalidad en la UCI y en el hospital.

Resultados: Se incluyeron 504 pacientes en el grupo *on-hours* y 602 en el grupo *off-hours*. En el análisis multivariable los factores asociados de forma independiente con la mortalidad hospitalaria fueron SAPS 3 (OR 1,10; IC 95% 1,08-1,12) y grupo *off-hours* (OR 2,00; IC 95% 1,20-3,33). En un análisis de subgrupos del grupo *off-hours* el ingreso de los pacientes en fin de semana o festivo frente a las noches de los días de diario se asoció de forma independiente con la mortalidad hospitalaria (OR 2,30; IC 95% 1,23-4,30).

Conclusiones: Ingresar en el grupo *off-hours* se asocia de forma independiente con la mortalidad. El ingreso en festivo se asocia de forma independiente con la mortalidad, independientemente del turno en que se produzca el ingreso los días de diario.

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Introduction

In general, the organization of hospital activity in our setting is based on work shifts. In this regard, the morning and afternoon shifts concentrate most of the medical team and scheduled activities, while the night shift, weekends and holidays are fundamentally attended by teams on duty. In some cases, the way in which hospital activities are organized can lead to changes in the prognosis of some patients, particularly those in critical condition.¹⁻³

A number of hypothesis have been proposed to explain the differences in prognosis conditioned to the timing or circumstances of patient admission. One possible explanation is that a poorer prognosis may result from a lower personnel/patient ratio, less experienced specialists, intensivists on call and not physically present in the Unit, or even tiredness of the medical team in certain work shifts.⁴⁻⁶ Other hypotheses point to possibly greater severity among patients who are admitted during the night or on weekends.⁷ A relationship has also been described between a poorer prognosis and patient admission during the morning clinical round,^{8,9}

though this has not been confirmed in the study published by Bisbal et al.¹⁰

The working hypothesis in this study is that there is a difference in mortality among patients admitted to the Intensive Care Unit (ICU) depending on the time of day at which admission takes place.

Specifically, the present study evaluates the repercussions of the timing of admission to the ICU upon patient prognosis in an ICU based on the "ICU without walls" model¹¹⁻¹³ of proactive early detection of patients at risk in hospital but outside the ICU.

Material and methods

A prospective, non-interventional observational cohort study was carried out, involving patients consecutively admitted to an adult polyvalent medical-surgical ICU with 8 beds in a 210-bed second-level hospital.

We included all the patients admitted to the Unit in the course of a three-year period from January 2010 to December 2012, excluding those subjects coming from the

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