



## ORIGINAL ARTICLE

### Real-time safety audits in a neonatal unit<sup>☆,☆☆</sup>



Elena Bergon-Sendin<sup>a,\*</sup>, María del Carmen Perez-Grande<sup>a</sup>, David Lora-Pablos<sup>b</sup>, Ana Melgar-Bonis<sup>a</sup>, Noelia Ureta-Velasco<sup>a</sup>, María Teresa Moral-Pumarega<sup>a</sup>, Carmen Rosa Pallas-Alonso<sup>a</sup>

<sup>a</sup> Servicio de Neonatología, Hospital Universitario 12 de Octubre, Madrid, Spain

<sup>b</sup> Unidad de Epidemiología Clínica, Hospital Universitario 12 de Octubre, Instituto de Investigación Biomédica I+s12, Madrid, Spain

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#### KEYWORDS

Safety audits;  
Neonatal intensive care;  
Patient safety;  
Emergency trolley;  
Resuscitation material;  
Adverse events;  
Newborn

#### Abstract

**Background:** Random audits are a safety tool to help in the prevention of adverse events, but they have not been widely used in hospitals. The aim of the study was to determine, through random safety audits, whether the information and material required for resuscitation were available for each patient in a neonatal intensive care unit and determine if factors related to the patient, time or location affect the implementation of the recommendations.

**Material and methods:** Prospective observational study conducted in a level III-C neonatal intensive care unit during the year 2012. The evaluation of written information on the endotracheal tube, mask and ambu bag prepared of each patient and laryngoscopes of the emergency trolley were included within a broader audit of technological resources and study procedures. The technological resources and procedures were randomly selected twice a week for audit. *Appropriate overall use* was defined when all evaluated variables were correctly programmed in the same procedure.

**Results:** A total of 296 audits were performed. The kappa coefficient of inter-observer agreement was 0.93. The rate of appropriate overall use of written information and material required for resuscitation was 62.50% (185/296). Mask and ambu bag prepared for each patient was the variable with better compliance (97.3%,  $P = .001$ ). Significant differences were found with improved usage during weekends vs. working-day (73.97 vs. 58.74%,  $P = .01$ ), and the rest of the year vs. 3rd quarter (66.06 vs. 52%,  $P = .02$ ).

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\* Corresponding author.

E-mail address: [ebergon@hotmail.com](mailto:ebergon@hotmail.com) (E. Bergon-Sendin).

**PALABRAS CLAVE**

Auditorías de seguridad;  
Cuidados intensivos neonatales;  
Seguridad del paciente;  
Material de reanimación;  
Carro de parada;  
Eventos adversos;  
Recién nacido

**Conclusions:** Only in 62.5% of cases was the information and the material necessary to attend to a critical situation urgently easily available. Opportunities for improvement were identified through the audits.

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**Auditorías de seguridad en tiempo real en una unidad neonatal****Resumen**

**Introducción:** Las auditorías en tiempo real son una herramienta de seguridad que apenas se ha aplicado anteriormente en el ámbito hospitalario. El objetivo del estudio fue determinar mediante auditorías si la información y el material necesario para la reanimación estaban disponibles para cada paciente de cuidados intensivos y si factores relacionados con el paciente, el momento o su ubicación en la unidad influyen en el cumplimiento de las recomendaciones.

**Material y métodos:** Estudio observacional prospectivo realizado durante el año 2012 en una unidad neonatal nivel III-C. Dentro de un estudio más amplio de auditorías de recursos tecnológicos y procedimientos se incluyó la evaluación de la información escrita sobre el tubo endotraqueal, mascarilla y ambú de cada paciente y los laringoscopios del carro de parada. Dos veces por semana al azar se seleccionaba qué procedimiento o recurso se iba a evaluar. Se definió la variable *uso global adecuado* cuando todos los ítems evaluados eran correctos en el mismo procedimiento.

**Resultados:** Se realizaron 17 auditorías que incluyeron 296 valoraciones. El coeficiente kappa interobservador fue 0,93. La frecuencia de *uso global adecuado* de la información y el material de reanimación fue de 62,50% (185/296). La mascarilla y ambú preparado en cada paciente fue la variable mejor cumplimentada (97,3%;  $p=0,001$ ). El *uso global adecuado* fue mejor en días festivos que en laborables (73,97 vs. 58,74%;  $p=0,01$ ) y el resto del año frente al verano (66,06 vs. 52%;  $p=0,02$ ).

**Conclusiones:** Solo en el 62,5% de los casos toda la información y el material necesario para atender una situación crítica de forma urgente estaba fácilmente disponible. Gracias a las auditorías se identificaron oportunidades de mejora.

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**Introduction**

Adverse health care events are a significant problem worldwide, as they are associated with a high morbidity in the short and long term.<sup>1-4</sup> In the case of neonatal intensive care units (NICUs), several studies have demonstrated that adverse events are a substantial problem, and all possible efforts are being made to minimise their occurrence.<sup>5-8</sup> Furthermore, critical unplanned events often happen in the NICU that favour the occurrence of adverse events. Therefore, it is essential that we identify the essential equipment needed to address these situations, such as every component needed to intubate and ventilate patients during resuscitation, and ensure that equipment is always accessible and functions correctly.

There are various safety tools at our disposal, including real-time safety audits (RTSAs), which are widely used in high-risk industries on account of their considerable ability to identify errors and risk situations and facilitate their prevention.<sup>9,10</sup> However, this approach has barely been applied to hospital settings.

For these reasons, we decided to use RTSAs to assess the adherence in our NICU to recommendations regarding the ventilation equipment that needs to be ready at each patient's station, the intubation equipment in each crash trolley and the documentation necessary to manage a critical situation. The aim of our study was to determine by means of audits whether the documentation and equipment needed for resuscitation was ready for each intensive care patient, and whether factors related to patient characteristics, the time of admission or the location in the unit had an impact on the degree of adherence to recommendations.

**Materials and methods**

We conducted a prospective observational study between January 1 and December 31, 2012 in the framework of a broader study whose purpose is to determine whether safety mechanisms in devices and protocols for the performance of the most frequent procedures were used correctly by conducting RTSA rounds. In this article, we will only describe the variables related to the documentation and equipment

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