



ORIGINAL ARTICLE

## Five years after the Spanish neonatal resuscitation survey. Are we improving?☆



M. Iriondo<sup>a,\*</sup>, M. Izquierdo<sup>a</sup>, E. Salguero<sup>b</sup>, J. Aguayo<sup>c</sup>, M. Vento<sup>d</sup>, M. Thió<sup>e</sup>,  
Grupo de Reanimación Neonatal de la Sociedad Española de Neonatología (GRN-SENeo)<sup>◇</sup>

<sup>a</sup> Servicio de Neonatología Sant Joan de Déu, BCNatal, Hospital Sant Joan de Déu-Hospital Clínic, Universidad de Barcelona, Barcelona, Spain

<sup>b</sup> Servicio de Neonatología, Hospital Materno Infantil Carlos Haya, Málaga, Spain

<sup>c</sup> Servicio de Neonatología, Hospital Universitario Virgen del Rocío, Sevilla, Spain

<sup>d</sup> Servicio de Neonatología, Hospital Universitario La Fe, Valencia, Spain

<sup>e</sup> Newborn Research Centre & Neonatal Services, The Royal Women's Hospital Melbourne, Melbourne, Australia

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### KEYWORDS

Neonatal  
resuscitation;  
Delivery room;  
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Survey

### Abstract

**Introduction:** An analysis is presented of delivery room (DR) neonatal resuscitation practices in Spanish hospitals.

**Methods:** A questionnaire was sent by e-mail to all hospitals attending deliveries in Spain.

**Results:** A total of 180 questionnaires were sent, of which 155 were fully completed (86%). Less than half (71, 46%) were level I or II hospitals, while 84 were level III hospital (54%). In almost three-quarters (74.2%) of the centres, parents and medical staff were involved in the decision on whether to start resuscitation or withdraw it. A qualified resuscitation team (at least two members) was available in 80% of the participant centres (63.9% level I–II, and 94.0% level III,  $P < .001$ ). Neonatal resuscitation courses were held in 90.3% of the centres. The availability of gas blenders, pulse oximeters, manual ventilators, and plastic wraps was higher in level III hospitals. Plastic wraps for pre-term hypothermia prevention were used in 63.9% of the centres (40.8% level I–II and 83.3% level III,  $P < .001$ ). Term newborn resuscitation was started on room air in 89.7% of the centres. A manual ventilator (T-piece) was the device used in most cases when ventilation was required (42.3% level I–II and 78.6% level III,  $P < .001$ ). Early CPAP in preterm infants was applied in 91.7% of the tertiary hospitals. In the last 5 years some practices have improved, such as neonatal resuscitation training, pulse oximeter use, or early CPAP support.

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\* Corresponding author.

E-mail address: [miriondo@hsjdbcn.org](mailto:miriondo@hsjdbcn.org) (M. Iriondo).

◇ Group members Neonatal Resuscitation of the Spanish Society of Neonatology (GRN-SENeo) are presented in [Annex 1](#).

**PALABRAS CLAVE**

Reanimación neonatal;  
Sala de partos;  
Recién nacido;  
Encuesta

**Conclusiones:** There is an improvement in some practices of neonatal resuscitation. Significant differences have been found regarding the equipment or practices in the DR, when comparing hospitals of different levels of care.

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**Encuesta española de reanimación neonatal 5 años después. ¿Vamos mejorando?****Resumen**

**Introducción:** Se analizan prácticas de reanimación neonatal en salas de partos (SP) de centros hospitalarios españoles.

**Métodos:** Se envió un cuestionario por centro a neonatólogos responsables de la atención del RN en SP de hospitales españoles.

**Resultados:** De 180 cuestionarios enviados, se cumplieron 155 (86%); 71 centros fueron de nivel I-II (46%) y 84 de nivel III (54%). La familia y el equipo médico participaron en decisiones de no reanimar o interrumpir la reanimación en el 74,2% de los centros. La disponibilidad de 2 o más reanimadores fue del 80% (94,0% en nivel II I y 63,9% en nivel I-II,  $p < 0,001$ ). En un 90,3% de centros se realizan cursos de Reanimación. En centros de nivel III fueron más frecuentes los mezcladores de gases, pulsioxímetros, ventiladores manuales y envoltorios de plástico. El uso de envoltorios de polietileno fue del 63,9%. En RN a término se inició la reanimación con aire en el 89,7% de los centros. El dispositivo más usado para aplicar VPP fue el «ventilador manual» (78,6% en nivel III y 42,3% en nivel I-II,  $p < 0,001$ ). En el 91,7% de los centros de nivel III se utilizó CPAP precoz en prematuros. En los últimos 5 años han mejorado prácticas como son la formación de profesionales, el uso de pulsioxímetros y de CPAP precoz.

**Conclusiones:** Existe una mejora progresiva en algunas prácticas de reanimación neonatal. Se encuentran diferencias en aspectos generales, equipamientos y protocolos de actuación durante la reanimación y transporte entre unidades de diferentes niveles.

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**Introduction**

Stabilisation and resuscitation at birth continue to be universal medical practices and it is estimated that one quarter of neonatal deaths are caused by birth asphyxia.<sup>1</sup>

Different organisations, such as the International Liaison Committee on Resuscitation (ILCOR),<sup>2</sup> the European Resuscitation Council,<sup>3</sup> the American Heart Association<sup>4</sup> and the Australian and New Zealand Resuscitation Councils<sup>5</sup> have published recommendations for neonatal resuscitation on a regular basis. Since its inception, the Group on Neonatal Resuscitation of the SENeO (Grupo de Reanimación Neonatal de la SENeO [GRN-SENeO]) has disseminated these recommendations through a manual that is now on its third edition<sup>6</sup> in addition to informative articles.<sup>7</sup>

While there is consensus between institutions, neonatal resuscitation practices vary across countries and even between hospitals within a single country.<sup>8-13</sup>

In 2009, the GRN-SENeO published a survey on neonatal resuscitation in delivery rooms that summarised the practices of the major Spanish hospitals in 2007.<sup>14</sup> Following the publication of the 2010 recommendations<sup>2-4</sup> and the third edition of the Spanish *Manual de reanimación neonatal* (Manual of neonatal resuscitation),<sup>7</sup> the GRN-SENeO

designed a new survey with the objective of assessing the evolution of resuscitation practices in Spain. This article presents and discusses the main results obtained from this assessment and compares them with the practices of other countries.

**Materials and methods**

In the last trimester of 2012, we sent a questionnaire by electronic mail to the major hospitals that attend deliveries in Spain. The questionnaire consisted of 48 items that explored aspects related to resuscitation in the delivery room: hospital demographics, ethics, equipment and materials, staff availability and qualifications, resuscitation clinical practices and care after resuscitation (see [Appendix B](#)).

We performed a descriptive statistical analysis, expressing qualitative variables as absolute and relative frequencies. We have compared qualitative variables by means of the  $\chi^2$  test. We considered  $P$ -values of 0.05 or less to be statistically significant. We show overall results for different aspects of resuscitation, comparing participating hospitals by level of care ([Table 1](#)).

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