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Neonatal Resuscitation Practices in Turkey: A Survey of the Turkish Neonatal Society and the Union of European Neonatal and Perinatal Societies

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What is already known on this topic?

- *Approximately 5%-10% of all newborns require support for the transition from intrauterine to extrauterine life. Providing optimal care at birth remains crucial to decrease neonatal morbidity and mortality.*
- *Guidelines are implemented worldwide to improve neonatal resuscitation practices.*

What this study adds on this topic?

- *The adherence to the international and national guidelines was high among centers with similar application rates in Turkey.*
- *Further implementations are required in the areas of antenatal counseling, cord management, and circulation assessment in the delivery room.*

ABSTRACT

Objective: Optimal care in the delivery room is important to decrease neonatal morbidity and mortality. We aimed to evaluate neonatal resuscitation practices in Turkish centers.

Materials and Methods: A cross-sectional survey consisted of a 91-item questionnaire focused on delivery room practices in neonatal resuscitation and was sent to 50 Turkish centers. Hospitals with <2500 and those with ≥2500 births/year were compared.

Results: In 2018, approximately 240 000 births occurred at participating hospitals with a median of 2630 births/year. Participating hospitals were able to provide nasal continuous-positive-airway-pressure/high-flow nasal cannula, mechanical ventilation, high-frequency oscillatory ventilation, inhaled nitric oxide, and therapeutic hypothermia similarly. Antenatal counseling was routinely performed on parents at 56% of all centers. A resuscitation team was present at 72% of deliveries. Umbilical cord management for both term and preterm infants was similar between centers. The rate of delayed cord clamping was approximately 60% in term and late preterm infants. Thermal management for preterm infants (<32 weeks) was similar. Hospitals had appropriate equipment with similar rates of interventions and management, except conti nuous-positive-airway-pressure and positive-end-expiratory-pressure levels (cmH_2O) used in preterm infants ($P = .021$, and $P = .032$). Ethical and educational aspects were also similar.

Conclusions: This survey provided information on neonatal resuscitation practices in a sample of hospitals from all regions of Turkey and allowed us to see weaknesses in some fields. Although adherence to the guidelines was high among centers, further implementations are required in the areas of antenatal counseling, cord management, and circulation assessment in the delivery room.

Keywords: Delivery room, neonatal resuscitation, survey, Turkey

INTRODUCTION

Although 90% of newborn infants do not require intervention during the transition from intrauterine to extrauterine life, approximately 5%-10% of all newborns require support and even 1% of them require advanced resuscitation at birth. Optimal care at birth with accurate and timely performance of delivery room applications is one of the most important interventions to decrease neonatal morbidity and mortality.[1-3]

Turkey is one of the developing countries with approximately 1.2 million births per year and a neonatal mortality rate of 5.8 per 1000 live births in 2018.[4] There is an official neonatal resuscitation education program conducted by the Ministry of Health which was structured in accordance with the American Academy of Pediatrics (AAP) and American Heart Association (AHA) guidelines and targeted health workers who have responsibilities for the mother–infant dyad during delivery. Turkish Neonatal Society members play an active role in this education program both in the development of the program and as trainers to improve compliance with the guidelines and to promote adequate knowledge of newborn life support. Additionally, the Turkish Neonatal Society has a national guideline to give recommendations for routine care of all newborns and resuscitation approaches for those who need them.[5]

This study aimed to evaluate the neonatal resuscitation practices in Turkish centers and compare the coherency of hospitals according to the number of births per year.

MATERIALS AND METHODS

This is a cross-sectional electronic, web-based survey involving birth centers in Turkey. This Turkish study is part of a European survey on delivery room practices endorsed by the Union of European Neonatal and Perinatal Societies (UENPS) and the Turkish Neonatal Society.[6] The study was approved by the Padua Provincial Institutional Review Board and declared as not meeting the criteria for human subject research.

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The survey consisted of a 91-item questionnaire focused on delivery room practices in neonatal resuscitation. It contained sections as epidemiological data, perinatal organization, equipment, procedures, ethics, and education. The questionnaire was prepared by a committee of experts on neonatal resuscitation and members of the Taskforce of the Neonatal Resuscitation of the Italian Society of Neonatology. The web-based survey link was sent to the directors of Turkish birth centers between January and September 2020 through the Turkish Neonatal Society.

High-risk delivery is defined as a delivery that involves a mother or a baby who may be at increased risk for adverse outcomes and health problems during pregnancy and/or during and after delivery.

In the analysis of returned questionnaires, we compared hospitals with <2500 births/year and hospitals with ≥2500 births/year. Frequency and percentage (n, %) were used to describe categorical data. Descriptive statistics were reported as median (interquartile range [IQR]). Pearson Chi-squared test and Fisher's exact test were used to compare the categorical variables between the hospitals. Statistical analysis was performed using IBM's Statistical Package for Social Sciences Statistics version 23 for Windows (IBM Corp.; Armonk, NY, USA).

RESULTS

The survey included 50 participating centers among which 44 (88%) were academic hospitals. In 2018, approximately 240 000 births occurred at participating hospitals which represent 20% of all births in Turkey (1 248 847) with a median of 2630 births/centers (IQR: 1445-4628). Among centers, 24 (48%) had <2500 births/year, and 26 (52%) had ≥2500 births/year.

Participating hospitals with <2500 or ≥2500 births/year were all able to provide nasal continuous-positive-airway-pressure (CPAP)/high-flow nasal cannula (100%) and mechanical ventilation (100%). The availability of high-frequency oscillatory ventilation (HFOV) (95.8% vs. 88.5%), inhaled nitric oxide (iNO) (58.3% vs. 76.9%), and therapeutic hypothermia (83.3% vs. 84.6) was similar between centers according to the number of births/year. Antenatal counseling was routinely performed to parents at 56% (n = 28) of all centers that were similar at each center (54.2% vs. 57.7%, $P = .802$) (Table 1).

Table 1. Characteristics of Hospitals and Organizational Aspects Before Birth

	Total (n = 50)	Hospitals With <2500 Births/Year (n = 24)	Hospitals With ≥2500 Births/Year (n = 26)	P
Academic hospital	44 (88)	22 (91.7)	22 (84.6)	.669
Available facilities in hospitals				
Nasal CPAP/HFNC	50 (100)	24 (100)	26 (100)	N/A
Mechanical ventilation	50 (100)	24 (100)	26 (100)	N/A
HFOV	46 (92)	23 (95.8)	23 (88.5)	.611
Inhaled nitric oxide	34 (68)	14 (58.3)	20 (76.9)	.159
Therapeutic hypothermia	42 (84)	20 (83.3)	22 (84.6)	.721
Before birth				
Antenatal counseling routinely performed before the delivery	28 (56)	13 (54.2)	15 (57.7)	1.00
Use of a checklist in the delivery room	45 (90)	21 (87.5)	24 (92.3)	.661
The resuscitation team is routinely composed of vital equipment for a low-risk delivery				
Pediatrician/neonatologist	34 (68)	19 (79.2)	15 (57.7)	.104
Obstetrician	10 (20)	5 (20.8)	5 (19.2)	1.00
Anesthesiologist	4 (8)	2 (8.3)	2 (7.7)	1.00
Midwife	15 (30)	5 (20.8)	10 (38.5)	.174
Nurse	38 (76)	16 (66.7)	22 (84.6)	.138
The resuscitation team is routinely composed of vital equipment for a high-risk delivery				
Pediatrician/neonatologist	50 (100)	24 (100)	26 (100)	N/A
Obstetrician	10 (20)	4 (16.7)	6 (23.1)	.728
Anesthesiologist	10 (20)	4 (16.7)	6 (23.1)	.728
Midwife	12 (24)	5 (20.8)	7 (26.9)	.614
Nurse	36 (72)	16 (66.7)	20 (76.9)	.420
Resuscitation team members qualified with full resuscitation skills				
Pediatrician/neonatologist	33 (66)	15 (62.5)	18 (69.2)	.616
Anesthesiologist	2 (4)	2 (7.7)	0 (0)	.491
Pediatrician/neonatologist and anesthesiologist	19 (38)	9 (37.5)	10 (38.5)	.944
Other	3 (6)	2 (8.3)	1 (3.8)	.602
Team briefing before resuscitation	40 (80)	19 (79.2)	21 (80.8)	1.00
Resuscitation team present at every delivery	36 (72)	20 (83.3)	16 (61.5)	.086

CPAP, continuous positive pressure ventilation; DR, delivery room; HFNC, high-flow nasal cannula.

Table 2. Umbilical Cord Management in Term and Preterm Infants

	Total (n = 50)	Hospitals With <2500 Births/Year (n=24)	Hospitals With ≥2500 Births/Year (n = 26)	*P*
Umbilical cord management in term infants				
Vaginally delivered				.656
Delayed cord clamping	30 (60)	13 (54.2)	17 (65.4)	
Immediate cord clamping	14 (28)	8 (33.3)	6 (23.1)	
Physiologically based cord clamping	5 (10)	3 (12.5)	2 (7.7)	
Milking	1 (2)	0	1 (3.8)	
Elective cesarean-delivered				.813
Delayed cord clamping	33 (66)	16 (66.7)	17 (65.4)	
Immediate cord clamping	10 (20)	5 (20.8)	5 (19.2)	
Milking	4 (8)	1 (4.2)	3 (11.5)	
Physiologically based cord clamping	3 (6)	2 (8.3)	1 (3.8)	
Emergency cesarean-delivered				.113
Immediate cord clamping	30 (60)	15 (62.5)	15 (57.7)	
Milking	12 (24)	8 (33.3)	4 (15.4)	
Physiologically based cord clamping	4 (8)	1 (4.2)	3 (11.5)	
Delayed cord clamping	4 (8)	0	4 (15.4)	
Umbilical cord management in late preterm infants				
Vaginally delivered				1.00
Delayed cord clamping	29 (58)	14 (58.3)	15 (57.7)	
Immediate cord clamping	11 (22)	6 (25)	5 (19.2)	
Milking	7 (14)	3 (12.5)	4 (15.4)	
Physiologically based cord clamping	3 (6)	1 (4.2)	2 (7.7)	
Cesarean-delivered				.226
Delayed cord clamping	29 (58)	14 (58.3)	15 (57.7)	
Immediate cord clamping	10 (20)	7 (29.2)	3 (11.5)	
Milking	9 (18)	3 (12.5)	6 (23.1)	
Physiologically based cord clamping	2 (4)	0	2 (7.7)	
Umbilical cord management for preterm infants				
Vaginally delivered (29-32 weeks)				.354
Milking	18 (36)	8 (33.3)	10 (38.5)	
Delayed cord clamping	16 (32)	9 (37.5)	7 (26.9)	
Immediate cord clamping	10 (20)	6 (25)	4 (15.4)	
Physiologically based cord clamping	6 (12)	1 (4.2)	5 (19.2)	
Cesarean-delivered (29-32 weeks)				.676
Milking	21 (42)	9 (37.5)	12 (46.2)	
Delayed cord clamping	18 (36)	10 (41.7)	8 (30.8)	
Immediate cord clamping	7 (14)	4 (16.7)	3 (11.5)	
Physiologically based cord clamping	4 (8)	1 (4.2)	3 (11.5)	
Vaginally delivered (<29 weeks)				.474
Milking	23 (46)	11 (45.8)	12 (46.2)	
Immediate cord clamping	17 (34)	10 (45.8)	7 (26.9)	
Delayed cord clamping	8 (16)	3 (12.5)	5 (19.2)	
Physiologically based cord clamping	2 (4)	0	2 (7.7)	
Cesarean-delivered (<29 weeks)				.751
Milking	25 (50)	13 (54.2)	12 (46.2)	
Immediate cord clamping	14 (28)	7 (29.2)	7 (26.9)	
Delayed cord clamping	9 (18)	4 (16.7)	5 (19.2)	
Physiologically based cord clamping	2 (4)	0	2 (7.7)	

A resuscitation team was present at 72% of deliveries. Hospitals with <2500 births/year had a non-significantly higher rate in the presence of a resuscitation team at all deliveries than those with ≥2500 births/year (83.3% vs. 61.5%, $P = .086$). A neonatologist or pediatrician attended 65% of low-risk deliveries whereas 100% of high-risk deliveries at each center (Table 1).

Umbilical cord management for both term and preterm infants was similar in each center. Delayed strategies such as delayed or physiologically based cord clamping were preferred in term and late preterm infants delivered vaginally or by elective cesarean, whereas immediate cord clamping (ICC) was preferred in infants delivered by emergency cesarean. Milking and

Table 3. Temperature and Thermal Management in the Delivery Room

	Total (n = 50)	Hospitals With <2500 Births/Year (n = 24)	Hospitals With ≥2500 Births/Year (n = 26)	*P*
Temperature				
Temperature of DR*		(n = 18)	(n = 25)	
Degrees (C°)	24 (24-26)	24 (23-26)	24 (24-26)	.706
I don't know	7 (14)	6 (25)	1 (3.8)	.045
Temperature of OR*		(n=18)	(n=23)	
Degrees (C°)	23 (21-24)	23 (21.5-24)	24 (20-24)	.720
I don't know	9 (18)	6 (25)	3 (11.5)	.281
Passive cooling started for infants considered at risk of HIE				1.00
Within 1 hour	47 (94)	23 (95.8)	24 (92.3)	
We do not have a specific time	3 (6)	1 (4.2)	2 (7.7)	
Thermal management for preterm infants (<32 weeks)				
Increasing the DR temperature	19 (38)	7 (29.2)	12 (46.2)	.216
Preheating the radiant warmer	47 (94)	24 (100)	23 (88.5)	.236
Servo-controlled temperature probe	38 (76)	16 (66.7)	22 (84.6)	.138
Pre-warmed towels	40 (80)	22 (91.7)	18 (69.2)	.077
Polyethylene plastic bag or wrap	47 (94)	22 (91.7)	25 (96.2)	.602
Hat	36 (72)	16 (66.7)	20 (76.9)	.420
Thermal mattress	2 (4)	1 (4.2)	1 (3.8)	1.00
Heated/humidified gases	22 (44)	11 (45.8)	11 (42.3)	.802

DR, delivery room; HIE, hypoxic–ischemic encephalopathy; IQR, interquartile range; OR. operating room.
*Data as median (IQR).

delayed cord clamping (DCC) were preferred mostly for preterm infants who were born at 29-32 weeks' gestation whereas milking and ICC were more commonly preferred for infants born <29 weeks' gestation (Table 2).

Thermal management for preterm infants (<32 weeks) was similar among centers (Table 3).

Hospitals had appropriate equipment to provide effective ventilation during resuscitation with similar rates of interventions and management. All had pulse oximeters and air/oxygen blenders, and T-piece devices were available in most of them (94% and 78%, respectively). Only CPAP and positive-end-expiratory-pressure (PEEP) levels (cmH_2O) used in preterm infants were different between hospitals. The CPAP/PEEP level of 5 cmH2O was used higher in hospitals with <2500 births/year whereas the level of 6 cmH_2O was preferred more in hospitals with ≥2500 births/year (Table 4).

Ethical and educational aspects were similar between hospitals with <2500 births/year and hospitals with ≥2500 births/year (Table 5).

DISCUSSION

The survey shows good compliance with international guidelines on neonatal resuscitation in participating Turkish centers. Although the number of births in these centers accounted for only one-fifth of the births in our country, the centers had participated from all regions of the country, and it was pleasing that there were no major variations in approaches in the delivery room between the centers.

The participating hospitals with low and high birth volumes were able to provide most of the facilities with highly similar rates. At 72% of deliveries, a resuscitation team was present. A neonatologist or pediatrician attended approximately two-thirds of low-risk deliveries, whereas in all of the high-risk deliveries regardless of the number of births. These findings can be explained as all hospitals were equipped with a neonatal intensive care unit and most of them were academic hospitals (88%). Unfortunately, antenatal counseling with parents before delivery was routinely performed in only half of the hospitals. This is lower than both the rate of level-II centers in Italy (90%),[7] and the overall rate of European hospitals (77%) included in the survey.[6]

There is great evidence showing that DCC provides short- and long-term benefits for the term and preterm infants.[8-12] It is recommended to clamp the umbilical cord in vigorous term and preterm infants for at least 30-60 seconds after birth.[1] Delayed or physiologically based cord clamping is performed on most term and late preterm infants both from vaginal and cesarean delivery in each entry. Delayed strategies were provided less in preterm infants. It is obvious that the resuscitation team should advocate for the implementation of DCC as part of the resuscitative process.

Thermal instability after delivery is known to increase mortality as well as morbidity in preterm and term infants. Monitoring the infant's temperature after birth and maintaining the temperature of the newborn between 36.5°C and 37.5°C are the key points of thermal control in the delivery room. The interventions recommended to maintain this include adequate environmental temperature, use of preheated radiant warmer, warm

Table 4. Airway, Ventilation, Circulation, and Medications in the Delivery Room

	Total (n = 50)	Hospitals With <2500 Births/Year (n = 24)	Hospitals With ≥2500 Births/Year (n = 26)	*P*
DR equipment				
Air/oxygen blender	47 (94)	23 (95.8)	24 (92.3)	1.00
Pulse oximeter	50 (100)	24 (100)	26 (100)	N/A
PPV administration with:				.382
Self-inflating bag	10 (20)	6 (25)	4 (15.4)	
T-piece device (Neopuff)	39 (78)	17 (70.8)	22 (84.6)	
Neonatal mechanical ventilator	1 (2)	1 (4.2)	0 (0)	
Sustained lung inflation				.354
Never	39 (78)	17 (70.8)	22 (84.6)	
Yes, occasionally	9 (18)	5 (20.8)	4 (15.4)	
Yes, routinely	2 (4)	2 (8.3)	0 (0)	
Initial FiO_2				
≥35-week infant needs PPV				.236
0.21	47 (94)	24 (100)	23 (88.5)	
0.30	3 (6)	0 (0)	3 (11.5)	
<35-week infant needs PPV				
0.21	22 (44)	11 (45.8)	11 (42.3)	.802
0.30	28 (56)	13 (54.2)	15 (57.7)	
Laryngeal mask use in DR	26 (52)	10 (41.7)	16 (61.5)	.160
Meconium-stained amniotic fluid management in a non-vigorous infant				1.00
Suctioning of the oro- and nasopharynx before delivery of the shoulders	3 (6)	23 (95.8)	24 (92.3)	
Starting PPV after removing secretions	47 (94)	1 (4.2)	2 (7.7)	
Ventilatory interface routinely used				.293
Facial mask	18 (36)	6 (25)	12 (46.2)	
Nasopharyngeal prongs or ETT	2 (4)	1 (4.2)	1 (3.8)	
Short binasal prongs	30 (60)	17 (70.8)	13 (50)	
CPAP levels (cmH_2O)				
Late preterm and term infants				.081
4	1 (2)	0	1 (3.8)	
5	32 (64)	19 (79.2)	13 (50)	
6	16 (32)	5 (20.8)	11 (42.3)	
8	1 (2)	0	1 (3.8)	
Preterm infants				.021
<5	1 (2)	1 (4.2)	0 (0)	
5	26 (52)	16 (66.7)	10 (38.5)	
6	20 (40)	5 (20.8)	15 (57.7)	
7	1 (2)	1 (4.2)	0	
8	2 (4)	1 (4.2)	1 (3.8)	
PEEP levels (cmH_2O)				
Late preterm and term infants				.606
4	1 (2)	0 (0)	1 (3.8)	
5	38 (76)	20 (83.3)	18 (69.2)	
6	10 (20)	4 (16.7)	6 (23.1)	
8	1 (2)	0 (0)	1 (3.8)	
Preterm infants				0.032
<5	1 (2)	1 (4.2)	0 (0)	
5	30 (60)	18 (75)	12 (46.2)	
6	17 (34)	4 (16.7)	13 (50)	
7	2 (4)	1 (4.2)	1 (3.8)	
PIP levels (cmH_2O)				
Late preterm and term infants				0.669

(*Continued*)

Table 4. Airway, Ventilation, Circulation, and Medications in the Delivery Room (*Continued*)

	Total (n = 50)	Hospitals With <2500 Births/Year (n = 24)	Hospitals With ≥2500 Births/Year (n = 26)	*P*
<20	15 (30)	8 (33.3)	7 (26.9)	
20	32(64)	15 (62.5)	17 (65.4)	
25	2 (4)	0 (0)	2 (7.7)	
30	1 (2)	1 (4.2)	0 (0)	
Preterm infants				0.688
<20	22 (44)	11 (45.8)	11 (42.4)	
20	24 (48)	11 (45.8)	13 (50)	
25	3 (6)	2 (8.3)	1 (3.8)	
30	1 (2)	0	1 (3.8)	
Heated/humidified gases availability	31 (62)	13 (54.2)	18 (69.2)	0.273
Heart rate assessment				
Palpation of the umbilical cord	8 (16)	3 (12.5)	5 (19.2)	0.704
Palpation of peripheral pulses	1 (2)	0 (0)	1 (3.8)	1.00
Stethoscope	42 (84)	21 (87.5)	21 (80.8)	0.704
Three-lead ECG monitor	17 (34)	6 (25)	11 (42.3)	0.197
Pulse oximeter	45 (90)	22 (91.7)	23 (88.5)	1.00
The skill of the team on intubation				0.920
Excellent	27(54)	13 (54.2)	14 (53.8)	
Good	18 (36)	8 (33.3)	10 (38.5)	
Sufficient	5 (10)	3 (12.5)	2 (7.7)	
End-tidal CO detector use	6 (12)	2 (8.3)	4 (15.4)	0.669
Surfactant use in DR	37 (74)	15 (62.5)	22 (84.6)	0.075
Caffeine use in DR	8 (16)	4 (16.7)	4 (15.4)	1.00

CPAP, continuous positive pressure ventilation; DR, delivery room; ETT, endotracheal tube; PEEP, positive end-expiratory pressure; PIP, peak inspiratory pressure; PPV, positive pressure ventilation.

and dry towel, polyethylene plastic bag, head cap, thermal mattress, and warmed/humidified respiratory gases.[1,3] In this survey, hospitals were aware of these interventions and use them at similar rates to prevent thermal loss and hyperthermia after birth. The thermal mattress was the less used approach in each center, preheating the radiant warmer and polyethylene plastic bag/wrap were the most commonly used approaches among hospitals. Nearly all hospitals started passive cooling within the first hour of life in infants considering the risk of hypoxic–ischemic encephalopathy in whom therapeutic hypothermia should be started within the first 6 hours of life.[13]

The participating centers reported that they had appropriate equipment. All had pulse oximeters (100%), and an air/oxygen blender was available in almost all hospitals (94%). The most important step in successful newborn resuscitation is effective ventilation. Self-inflating bags, flow-inflating bags, and the T-piece resuscitator are the devices used to deliver positive pressure ventilation.[14] T-piece resuscitator was the most commonly preferred device in hospitals, predominantly using short binasal prongs as the first choice of interface. The use of CPAP has traditionally been with PEEP levels between 5 and 8 cmH_2O.[15-17] The parameters of ventilation support were almost similar between the hospitals except for CPAP and PEEP levels (cmH_2O) used in preterm infants of which the level of 5 cmH_2O was used higher in hospitals with <2500 births/year whereas the level of 6 cmH_2O was more preferable in hospitals with ≥2500 births/year. An increase in heart rate and chest rise are the indicators of effective ventilation. Guidelines recommend using 3-lead electrocardiography as a reliable heart rate assessment,[1,2,18] but it was used in only one-third of responding centers.

The limit of viability has altered with the advances in perinatal and neonatal medicine. There is considerable agreement for comfort care at 22 weeks' gestational age, and active care at 25 weeks' gestational age, despite a wide variation in recommendations for resuscitation of immature preterm infants among developed countries.[19-22] Majority of neonatologists involve to set limits for interventions and end-of-life decisions in different ways among countries in Europe.[23,24] In our country, legal regulations define abortus as a gestational age of below 20 weeks but propose that every baby who shows any sign of vitality regardless of gestational age should be given the "right to live" and should get resuscitation.[25] The official neonatal resuscitation program is held according to the demands and needs of the hospitals. Courses are held in 90% of participating centers with varying frequency between the hospitals.

This study has some limitations and strengths. Although 50 Turkish centers responded to the survey, and the number of births in these centers covers one-fifth of all births in our country, these centers have participated from all regions of the country, and all of them follow the same national guidelines of the Turkish Neonatal Society. So, the obtained data may reflect the generalizability of the findings for our country. This study also included a structured questionnaire about specific titles of neonatal resuscitation that aimed to

Table 5. Ethics and Education

	Total (n = 50)	Hospitals With <2500 Birth/Year (n = 24)	Hospitals With ≥250 Birth/Year (n = 26)	*P*
Ethics for preterm infants				
Gestational age limit for initiating full resuscitation at birth				.166
Yes	20 (40)	12 (50)	8 (30.8)	
No	30 (60)	12 (50)	18 (69.2)	
Time limit to stop full resuscitation in severely asphyxiated infant				.247
Yes	27 (54)	15 (62.5)	12 (46.2)	
No	23 (46)	9 (37.5)	14 (53.8)	
Parental opinion influence on interventions				.561
No, at all	38 (76)	20 (83.3)	18 (69.2)	
A little bit	7 (14)	2 (8.3)	5 (19.2)	
Yes, enough	5 (10)	2 (8.3)	3 (11.5)	
Education				
Courses on neonatal resuscitation routinely	45 (90)	23 (95.8)	22 (84.6)	.351
Neonatal Resuscitation algorithm follows				.723
AAP and AHA	31 (62)	15 (62.5)	16 (61.5)	
ERC	3 (6)	2 (8.3)	1 (3.8)	
ILCOR	4 (8)	2 (8.3)	2 (7.7)	
National guidelines	7 (14)	4 (16.7)	3 (11.5)	
NA	5 (10)	1 (4.2)	4 (15.4)	
Neonatal resuscitation teams retrained every:				.776
<6 months	5 (10)	3 (12.5)	2 (7.7)	
6-12 months	10 (20)	6 (25)	4 (15.4)	
12-24 months	9 (18)	4 (16.7)	5 (19.2)	
>24 months	26 (52)	11 (45.8)	15 (57.7)	

AAP, American Academy of Pediatrics; AHA, American Heart Association; ERC, European Resuscitation Council; ILCOR, International Liaison Committee on Resuscitation.

obtain objective information. Since most of the centers (88%) included in this study were academic hospitals, these centers provide enough equipment and health care professionals. It will be better to investigate the neonatal resuscitation practices in other kinds of hospitals in Turkey such as state hospitals, research and training hospitals, and private hospitals following this study.

CONCLUSION

The results of this survey give information on the neonatal resuscitation practices that are used and performed in a sample of hospitals in Turkey. With the data collected by this study, we learned and realized our weaknesses in the field of neonatal resuscitation. The adherence to the international and national guidelines was high among centers with similar application rates, but further implementations are required in the areas of antenatal counseling, cord management, and circulation assessment in the delivery room. The intent of the Turkish Neonatal Society will be to emphasize and improve these issues.

Ethics Committee Approval: The study received approval from the Padua Provincial Institutional Review Board (protocol #0035420) as not meeting the criteria for human subject research.

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