Jordan Medical Journal

ORIGINAL ARTICLE

Assessment of Practices and Gaps in the Diagnosis, Management, and Follow-up of Newborns with Hypoxic-Ischemic Encephalopathy in Jordan: A Survey of Practicing Neonatologists and Pediatricians

Eman F Badran[1]*, Ahmad Rawajbeh[2], Waseem Alhaj[2], Abdallah Elqunj[3], Ala'a Al-Qhaiwi[1], Rafeef Qawasmeh[1], Majd Alhalaki[1], Mohammad Askar[4], Maryam Al Jammal[4]

[1] Pediatric Department, School of Medicine, University of Jordan, Amman, Jordan

[2] Surgical Department School of Medicine, University of Jordan, Amman, Jordan

[3] Anesthesia Department School of Medicine, University of Jordan, Amman, Jordan

[4] School of Medicine, University of Jordan, Amman, Jordan

*Corresponding author:
e.badran@ju.edu.jo

Received: October 25, 2023
Accepted: January 1, 2024

DOI:
https://doi.org/10.35516/jmj.v59i2.1907

Abstract

Background and Aims: To identify care gaps in newborns with HIE, and evaluate the practices of neonatologists and pediatricians in Jordan. The impact of HIE as Jordan's fourth top cause of infant mortality is highlighted.

Methods: A cross-sectional survey of 15 neonatologists and 42 pediatricians in Jordan was conducted. A 35-item questionnaire was used to collect data on demographics, diagnosis criteria, management approach, and follow-up services.

Results: The participants reported that 70% used Apgar for neonatal assessment and SARNAT staging for HIE severity. 30% of neonates were transferred to intensive care, 70% began therapeutic hypothermia within 6 hours, and 63.2% continued for 72 hours. There was a limited access to brain imaging.

Conclusion: To improve neonatal care in Jordan, an organized HIE practice bundle is recommended.

Keywords: Neonate, hypoxic-ischemic encephalopathy, therapeutic hypothermia, outcome.

INTRODUCTION

Hypoxic-ischemic encephalopathy (HIE) is a serious complication of intrapartum or late antepartum hypoxia that affects full-term infants and causes aberrant neurodevelopment outcomes [1, 2]. Asphyxia, caused by poor gas exchange, leads to anoxia and severe hypercarbia [3]. Alarmingly, HIE caused by perinatal hypoxia accounts for roughly a quarter of all newborn deaths worldwide [4]. Its consequences do not stop there: HIE causes persistent neurological illnesses such as epilepsy and cerebral palsy [5]. While high-income countries have an incidence rate of 1.5 HIE cases/ 1000 live births, low-middle-income countries have rates that range from 2.3 to 26.5/1000 live births [6]. Therapeutic hypothermia (TH), which entails keeping rectal temperatures between 33°C and 34°C, has emerged because It is intended to reduce the neurological damage caused by the HIE

by lowering tissue energy demands [7]. When given early, before 6 hours after birth, TH dramatically reduces the risks of mortality and neurological abnormalities in HIE-affected newborns [3]. As a result, in countries with high incomes, TH is regarded as the gold standard of care for neonatal HIE [8]. However, the gold standard remains elusive in many countries, including Jordan. Jordan developed national guidelines for perinatal asphyxia management in 2017, however, a complete study of its HIE care landscape is still needed. It is critical to recognize that the benefits of TH in affluent countries may not be easily transferred to low- and middle-income countries (LMICs) or resource-constrained settings [9, 10]. Multiple obstacles, ranging from insufficient newborn care to the use of subpar cooling systems, could jeopardize its effectiveness [8]. A significant systematic analysis, however, indicates TH's ability to considerably reduce mortality rates in moderate-to-severe HIE newborns, irrespective of the country's economic status [3]. Given this context, it is critical to first understand the problems that healthcare providers face to improve standards of care. This study aims to examine clinical practices regarding HIE diagnosis, management, and subsequent follow-up, to improve care for newborns with HIE.

METHODS

A cross-sectional study was carried out from October to November 2021 with the aim of including all pediatricians and neonatologists who treat neonates with hypoxic-ischemic encephalopathy (HIE) in NICUs [1]. Using the Jordan Medical Council registry, we identified 1184 general pediatricians and 34 neonatologists. A total of 72who treated HIE cases were contacted (38 pediatricians and 34 neonatologists). 57 agreed to participate, including 15 neonatologists and 42 pediatricians. To gain a broad perspective on HIE procedures, representatives from the Ministry of Health, university hospitals, commercial sector hospitals, and Royal Medical Services institutions were secured.

Questionnaire Data Collection:

The adapted English questionnaire from two previous publications [11, 12] were sent electronically. It consists of 41 items, distributed across four dimensions: (i) participant demographics, clinical workplace description, and guideline awareness (15 items); (ii) criteria used for HIE diagnosis, newborn care, and parent's support (8 items); (iii) criteria used to determine HIE management strategy, including TH practice (14 items); and (iv) availability of long-term services for HIE follow-up (4 items). Every question has a 5-point Likert scale, and the anchors indicate how often the practices are utilized. These anchors are as follows: 1, never; 2, infrequently; 3, sporadically; 4, often; and 5, consistently. The frequency of practices used was classified by the Likert score, as follows: low, 1.00-2.33; medium, 2.34-3.67; and high, 3.68-5.00. The questionnaire was piloted on 10% of the sample size, including senior pediatric residents, to evaluate its validity and reliability before use in this study; the pilot data were not included in the study analysis. The face validity of the questionnaire was confirmed by three academic reviewers. With regards to reliability, Cronbach's Alpha values were 0.793 for the dimension of diagnosis, 0.786 for management, and 0.715 for follow-up.

Levels of Neonatal Care:

The criteria for categorizing newborn care were [13]: Level II care, which is intended for

newborns delivered at or after 32 weeks of gestation and weighing 1500g or more, offers recovery after NICU discharge. It is also appropriate for infants delivered before 32 weeks of gestation who weigh less than 1500g before being transferred to a NICU. Level III, on the other hand, is reserved for newborns delivered before 32 weeks of gestation or weighing less than 1500g, as well as all seriously ill newborns, providing them with significant medical and respiratory support.

Ethical Statement

The University of Jordan School of Medicine Ethics Review Board granted ethical permission for the study technique (IRB approval: 503/2021/76, 202127894). In accordance with core principles of epidemiological practice, informed consent was obtained from participants, and data confidentiality was strictly observed.

Statistical analysis

Descriptive statistics were used to summarize information across the four domains of the questionnaire, including mean, standard deviation or frequency as appropriate for the data type and distribution. Descriptive statistics were calculated using IBM SPSS Statistics (version 24).

RESULTS

As shown in Table 1, The study found a female predominance (59.6%). The age group with the highest representation (54.4%) was between 30 and 40 years old. In terms of professional specialty, general pediatricians accounted for 63.2%, whereas neonatologists accounted for 26.3%. A significant 71.9% of participants had less than 10 years of clinical experience. In terms of institutional affiliation, private hospitals had the lead with 33.3%. The vast majority (84.2%) were from tertiary newborn units. Most of Participants aware of the national HIE guidelines, (73.7%) and therapeutic hypothermia protocol (71.9%).

For the HIE Diagnostic Criteria: The Apgar score (Mean: 4.70) and neurological symptoms (Mean: 4.74) are the highest method in HIE diagnosis. Furthermore, Brain MRI within 1-2 weeks post-birth (Mean: 3.91), and blood gas tests (both peripheral venous in the first hour, Mean: 3.89, and venous/artery cord in the first hour, Mean: 3.88) are also reported as high important level.

Other cerebral activity monitoring techniques, such as amplitude-integrated EEG, video EEG, and continuous cerebral function monitors, are less frequently utilized (Mean: 3.32). on the other hand, Ultrasound use was reported to be limited. Senior pediatric residents (years 3 or 4) with a mean score of 4.18 and delivery room nurses (Mean: 4.44) play critical roles when attending the complicated deliveries. The involvement of neonatologists is moderate (Mean: 2.74). For HIE Severity Assessment: The SARNAT Staging Score and general clinical assessment (both having a Mean score of 4.19) are the preferred used techniques. MRIs are routinely performed within 1-2 weeks of delivery for imaging and monitoring of the brain. The availability of cerebral activity monitoring devices is moderate to low, with the most typically utilized being conventional EEG. The study revealed a high level of Professional-trained Radiologists skilled in MRI and brain ultrasound neuroimaging interpretation, whereas neonatologists have varying levels of proficiency. Approximately 26.3% of participants do not check blood glucose immediately after birth, while 28.8%

Table 1: Demographic characteristics of the participants (N=57)

	Frequency (n)	Percentage (%)
Sex		
Male	23	40.4
Female	34	59.6
Age		
<30 years	10	17.5
30-40 years	31	54.4
>40 years	16	28.1
Specialty		
General pediatrician	42	63.2
Neonatologist	15	26.3
Clinical experience		
<10 years	41	71.9
≥10 years	16	28.1
Hospital Type		
Ministry of health hospital	14	24.6
Military hospital	10	17.5
Academic teaching hospital	14	24.6
Private hospital	19	33.3
Tertiary Level III neonatal center		
Yes	48	84.2
No	9	15.8
Awareness of HIE guidelines in Jordan		
Yes	42	73.7
No	15	26.3
Awareness of the therapeutic hypothermia protocol used in Jordan		
Yes	41	71.9
No	16	28.1

perform blood gas analysis within the same time frame. Figure 1 reveals that only 47.4% of participants provide support to parents. As shown in Table 3, Specialized active cooling devices and the practice of shutting off the heating are both frequent strategies of medium relevance. Notably, 71.1% of patients start therapeutic hypothermia (TH) during the first 6 hours of birth, and 36.3% maintain treatment for the full 72-hour period. The rectal method is the most often used method for measuring temperature, either continuously or at 15–30-minute intervals, with both methods receiving a medium relevance rating. General neurological exams have the highest significance ranking for tracking development. In the meantime, tools like the Bayley Infant Neurodevelopmental Screen are considered relatively important.

Long-Term Follow-Up: Almost half of institutions (47.4%) provide long-term follow-ups for children with HIE on a consistent basis.

DISCUSSION

The Sustainable Development Goals (SDGs) aim to reduce neonatal mortality to less than 12 deaths per 1000 live births by 2030 [14]. With birth asphyxia being the leading cause of infant death in our country, it highlights the need for clinical approaches to hypoxic-ischemic encephalopathy (HIE) to be re-evaluated in countries with similar economic characteristics [15].

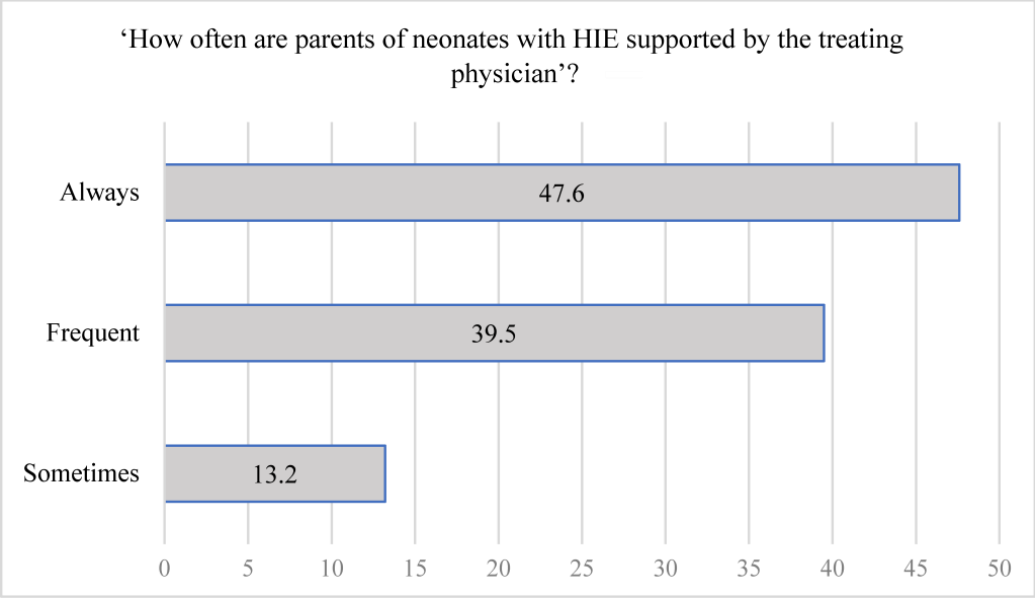

Figure 1: Parents support by physicians

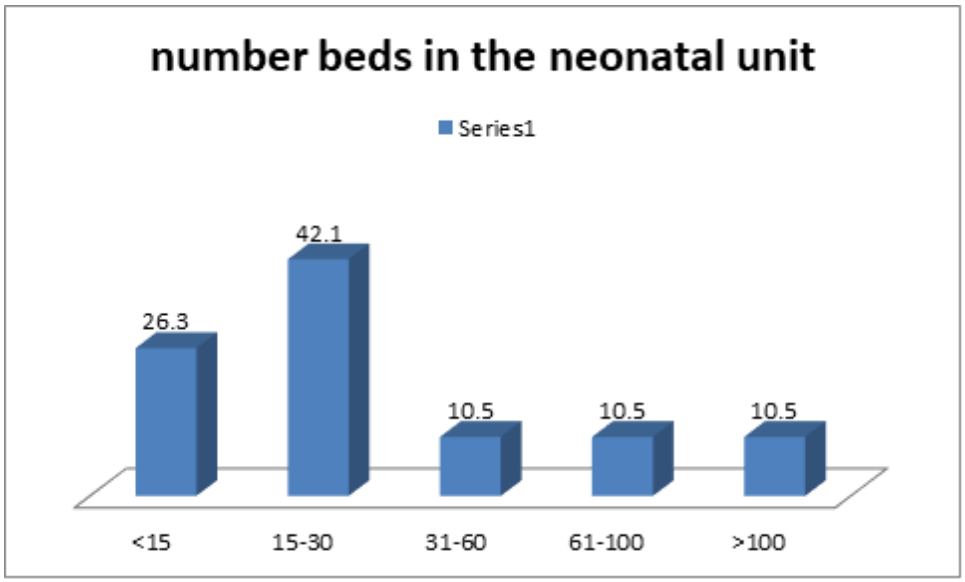

Figure 2: Neonatal Unit work load

Table 2: Diagnosis and management if HIE: Likert scale scores for the criteria indicators used for diagnosing and management HIE (N=57)

Statements	Mean	Standard Deviation	Importance Level
Criteria Indicators for Diagnosing HIE			
Neurological manifestations	4.74	0.79	High
APGAR Score at one minute / 5 minute / 10 minutes	4.70	0.82	High
Blood tests	4.28	1.03	High
Brain MRI	3.91	1.20	High
Peripheral venous blood gas in first hour	3.89	1.03	High
Venous/artery cord gas in first hour	3.88	1.13	High
Head ultrasound	3.51	1.30	Medium
Umbilical artery blood gas in first hour	3.49	1.36	Medium
EEG	3.32	1.33	Medium
Brain CT	2.93	1.27	Medium
Total	3.86	0.62	High
Healthcare Staff available for complicated deliveries and neonatal resuscitation			
Delivery room staff nurse	4.44	1.05	High
Pediatric resident in year 3 or 4	4.18	1.27	High
Midwife	4.09	1.21	High
Nursery staff nurse	3.51	1.57	Medium
General pediatrician	3.42	1.35	Medium
Neonatal nurse	3.39	1.42	Medium
Pediatric resident in year 1 or 2	3.07	1.51	Medium
Neonatologist	2.74	1.06	Medium
Total	3.60	0.59	Medium
Methods for HIE Severity			
Neurological staging scale used for HIE severity			
SARNAT and SARNAT STAGING	4.19	1.04	High
General clinical assessment	4.19	1.27	High
THOMBSON Score	2.61	1.33	Medium
Total	3.67	0.80	Medium
Timing of first MRI			
After post-natal month 1	3.40	1.28	Medium
Within post-natal week 1-2	3.32	1.24	Medium
Within post-natal week 1	3.21	1.50	Medium
Total	3.31	0.80	Medium
Availability of cerebral activity monitoring devices			
Regular EEG	3.33	1.52	Medium
aEEG	2.37	1.41	Medium
Video EEG	2.33	1.41	Low
Continuous cerebral function monitor	2.16	1.40	Low
Total	2.55	1.04	Medium
Available professionals trained in brain neuroimaging interpretation			
Radiologist trained in MRI interpretation	4.00	1.34	High
Radiologist trained in brain ultrasound interpretation	3.72	1.26	High
Neonatologist trained in brain ultrasound interpretation	3.30	1.57	Medium
Radiologist trained in Doppler ultrasound	3.25	1.54	Medium
Neonatologist trained in MRI interpretation	2.68	1.48	Medium
Neonatologist trained in Doppler ultrasound	2.26	1.38	Low
Total	3.20	1.01	Medium
Frequentcy to measure blood glucose within the first 6 hours after birth?	**Frequency (N)**	**Percentage(%)**	**Mean (Standard Deviation)**
			4.67 (0.69)
Always	42	73.7	
Frequently	13	22.8	
Sometimes	1	1.8	
Seldom	---	---	
Never	1	1.8	
Total	**57**	**100.0**	**High**

HIE: hypoxic-ischemic encephalopathy; EEG, electroencephalogram:aEEG; MRI: magnetic resonance imaging; EEG: electroencephalogram; aEEG: amplitude integrated electro; CT: computed tomography

Table 3: HIE Therapeutic Practices and Long-Term Follow-up (N=38)

Statements	Mean	Std. Deviation	Importance Level
Special active cooling device system with. Servo-control system	3.66	1.65	Medium
Turning off the heating	3.66	1.40	Medium
Hypothermia using ice packs	2.76	1.65	Medium
Cooled water mattress or bag	2.42	1.59	Medium
Turning on air conditioners	2.08	1.42	Low
Total	2.92	0.78	Medium
Type of cooling device			
Whole-body cooling	4.29	1.29	High
Head cooling and whole-body cooling at the same time	3.24	1.72	Medium
Selective head cooling	2.21	1.44	Low
Total	3.25	0.87	Medium
Method for temperature measurement			
Rectally	4.48	1.00	High
Axillary	2.73	1.46	Medium
Total	3.61	0.78	Medium
Frequency of temperature monitoring during hypothermia			
Continuously	3.66	1.60	Medium
Every 15-30 minutes	2.92	1.36	Medium
Every 30-60 minutes	2.82	1.52	Medium
Every 5-15 minutes	2.76	1.17	Medium
Every 60-120 minutes (1-2 hours)	2.34	1.36	Medium
Total	2.90	0.78	Medium
	Freq.		%
Frequency of the therapeutic hypothermia initiation within the first 6 hours after birth			
Never	-		-
Seldom	1		2.6
Sometimes	-		-
Frequently	10		26.3
Always	27		71.1
Total	38		100.0

Hospital department responsible for the neurodevelopmental assessment of neonates with HIE	Mean	Std. Deviation	Importance Level
Neurology	4.55	0.86	High
Neonatology	4.42	1.00	High
General child health care pediatric department	3.24	1.38	Medium
Child rehabilitation	3.21	1.32	Medium
Child development department	2.82	1.66	Medium
General child health care departments (primary health care)	2.55	1.37	Medium
Total	3.48	0.70	Medium
Neurodevelopmental assessment used in the follow-up program			
General neurological examination	4.82	0.51	High
Bayley Infant Neurodevelopmental Screen	3.21	1.30	Medium
Ages and Stages questionnaire (ASQ)	2.87	1.28	Medium
Total	**3.66**	**0.80**	**Medium**

Our findings show that key caregivers during complicated deliveries were mainly nurses and pediatric residents in their advanced years of training. This approach needs to be in line with the guidelines of the Neonatal Resuscitation Program, which emphasize the presence of a skilled doctor during deliveries to reduce the risk of birth asphyxia [16]. The Apgar score, necessity for urgent resuscitation, and specific clinical signs all play important roles in evaluating the risk of HIE in newborns. Our findings highlight the importance of the Apgar score as an essential metric for determining the need for neonatal TH recruitment [17].

However, advanced diagnostic methods such as electroencephalography (EEG) were rarely used, often due to limitations such as equipment availability [18]. Even when competent radiologists were available, standardized brain imaging procedures were not regularly used. A noteworthy finding was the underutilization of postnatal blood glucose level measures, despite the fact that they have been shown to have implications for HIE prognosis [19]. Although therapeutic hypothermia (TH) is supported for its role in reducing mortality related to HIE, our results show that it is used inconsistently in Jordan [20]. This gap could be attributable to a mix of unfamiliarity with HIE guidelines and a lack of hands-on experience. Concurrently, issues such as the lack of specialized infant transport systems undermine the effectiveness of TH.

Our survey found that a considerable proportion of neonatologists used non-standardized cooling methods due to a lack of required equipment [21], highlighting differences in treatment modalities. However, considering national's neonatal death data [15], the immediate problem remains the unsatisfactory achievement of the optimum core temperature during TH, demanding an overhaul in cooling techniques. Respondents' approaches to reducing stress in critically ill infants differed. There were some exceptions from the standards, including as the widespread practice of fasting during TH and the

restricted long-term follow-up for babies with HIE [22]. The importance of parental support for optimal family outcomes seems to be infrequently reported [23].

This study has limitations, including a low response rate and potential participant bias from one big institution. Future research should include more participants from other facilities to improve the findings' comprehensiveness and generalizability.

In conclusion our study used a cross-sectional design to look at how neonatologists and pediatricians in Jordan approach hypoxic-ischemic encephalopathy (HIE) in newborns. The data presented highlights crucial areas in need of improvement, such as equipment availability, and hands-on experience, with a strong emphasis on improving diagnostic capabilities and creating effective long-term monitoring. While Jordan's medical professionals are aligned with globally recognized benchmarks as the Apgar score and SARNAT staging, there are clear barriers, most notably in using advanced diagnostic methods, like obtaining timely brain imaging and monitoring. Our findings highlight the scarcity of comprehensive, long-term services for newborns diagnosed with HIE. Streamlining these inconsistencies and maintaining consistency in clinical best practices will significantly improve care quality for babies with HIE in the region. We advocate for the development of a comprehensive HIE management framework, strengthened physician training programs, and the adoption of a unified set of national HIE care recommendations. One of the research's strength is that it establishes an essential precedent, providing a road for future treatment strategies and scholarly inquiries. The incorporation of our suggested guidelines has the potential to raise the level of newborn HIE management, encouraging healthier outcomes for newborn population.

Acknowledgments

We thank the physicians who participated in the survey and the specialists who reviewed our questionnaire for validity.

Statements and Declarations

Funding

The authors declare they have no direct or indirect financial interests.

Disclosure of potential conflicts of interest

The authors have no conflicts of interest to declare relevant to this article's content.

Ethical approval and Informed consent

The study methods were approved by the Ethics Review Board of the University of Jordan School of Medicine (IRB approval number 503/2021/76, 202127894). Informed consent was obtained from all participants before being administered the questionnaire.

Consent for publication

Not applicable.

REFERENCES

1. Greco P, Nencini G, Piva I, Scioscia M, Volta CA, Spadaro S, et al. Pathophysiology of hypoxic-ischemic encephalopathy: a review of the past and a view on the future. Acta Neurologica Belgica. 2020; 120: 277-288. https: //doi.org/10.1007/s13760-020-01308-3
2. Laptook AR, Shankaran S, Tyson JE, Munoz B, Bell EF, Goldberg RN, et al. Effect of Therapeutic Hypothermia Initiated After 6 Hours of Age on Death or Disability Among Newborns With Hypoxic-Ischemic Encephalopathy: A Randomized Clinical Trial. JAMA. 2017; 318(16): 1550–60. https: //doi.org/10.1001/jama.2017.14972
3. Abate BB, Bimerew M, Gebremichael B, Mengesha Kassie A, Kassaw M, Gebremeskel T, et al. Effects of therapeutic hypothermia on death among asphyxiated neonates with hypoxic-ischemic encephalopathy: A systematic review and meta-analysis of randomized control trials. Schmölzer GM, editor. PLOS ONE. 2021; 16(2): e0247229. https: //doi.org/10.1371/journal.pone.0247229
4. Lawn JE, Cousens S, Zupan J. 4 million neonatal deaths: When? Where? Why? The Lancet. 2005; 365(9462): 891–900. https: //doi.org/10.1016/S0140-6736(05)71048-5
5. Atici A, Celik Y, Gulasi S, Turhan AH, Okuyaz C, Sungur MA. Comparison of selective head cooling therapy and whole body cooling therapy in newborns with hypoxic ischemic encephalopathy: Short term results. Türk Pediatri Arşivi. 2015; 50(1): 27–36. https: //doi.org/10.5152/tpa.2015.2167
6. Namusoke H, Nannyonga MM, Ssebunya R, Nakibuuka VK, Mworozi E. Incidence and short term outcomes of neonates with hypoxic ischemic encephalopathy in a Peri Urban teaching hospital, Uganda: a prospective cohort study. Maternal Health, Neonatology and Perinatology. 2018; 7; 4. https: //doi.org/10.1186/s40748-018-0074-4
7. Nolan JP, Morley PT, Vanden Hoek TL, Hickey RW, Kloeck WGJ, Billi J, et al. Therapeutic Hypothermia After Cardiac Arrest. Circulation. 2003; 108(1): 118–21. https: //doi.org/10.1161/01.CIR.0000079019.02601.90
8. Marlow N, Shankaran S, Rogers EE, Maitre NL, Smyser CD. Neurological and developmental outcomes following neonatal encephalopathy treated with therapeutic hypothermia. Seminars in Fetal and Neonatal Medicine. 2021; 101274. https: //doi.org/10.1016/j.siny.2021.101274
9. Thayyil S. Cooling therapy for the management of hypoxic-ischaemic encephalopathy in middle-income countries: we can, but should we? Paediatr Int Child Health. 2019; 39: 231-233. https: //doi.org/10.1080/20469047.2019.1596586
10. Bellos I, Devi U, Pandita A. Therapeutic Hypothermia for Neonatal Encephalopathy in Low- and Middle-Income Countries: A Meta-Analysis. Neonatology. 2022; 119(3): 300–10. https: //doi.org/10.1159/000522317
11. Wang Z, Zhang P, Zhou W, Xia S, Zhou W, Zhou X, et al. Neonatal hypoxic-ischemic encephalopathy diagnosis and treatment: a National Survey in China. BMC Pediatrics. 2021; 21(1). https: //doi.org/10.1186/s12887-021-02737-6
12. Arnáez J, García-Alix A, Calvo S, Simón Pedro Lubián-López, J. Diez-Delgado, Benavente I, et al. Care of the newborn with perinatal asphyxia candidate for therapeutic hypothermia during the first six hours of life in Spain. Anales de Pediatría (English Edition). 2018; 89(4): 211–21. https: //doi.org/10.1016/j.anpede.2017.11.010
13. American Academy of Pediatrics Committee on Fetus and Newborn. Levels of neonatal care. Pediatrics 2012; 130: 587-597. https: //doi.org/10.1542/peds.2012-1999
14. Hug L, Alexander M, You D, Alkema L. National, regional, and global levels and trends in neonatal

mortality between 1990 and 2017, with scenario-based projections to 2030: a systematic analysis. The Lancet Global Health. 2019 Jun 1; 7(6): e710-20.

15. Batieha AM, Khader YS, Berdzuli N, Chua-Oon C, Badran EF, Al-Sheyab NA, et al. Level, Causes and Risk Factors of Neonatal Mortality, in Jordan: Results of a National Prospective Study. Maternal and Child Health Journal. 2016, cited 2022; 20(5): 1061–71. https: //doi.org/10.1007/s10995-015-1892-x
16. Weiner GM, Zaichin J. Textbook of Neonatal Resuscitation (8th Edition). American Heart Association & American Academy of Pediatrics. 2021 june;
https: //doi.org/10.1542/9781610025256
17. American Academy of Pediatrics Committee on Fetus and Newborn, American College of Obstetricians and Gynecologists Committee on Obstetric Practice. The Apgar score. Pediatrics. 2015; 136: 819-822.
https: //doi.org/10.1542/peds.2015-2651
18. Sandoval Karamian AG, Wusthoff CJ. Current and future uses of continuous EEG in the NICU. Frontiers in Pediatrics. 2021 Nov 3; 9: 768670.
19. Lee IC, Yang JJ, Liou YM. Early blood glucose level post-admission correlates with the outcomes and oxidative stress in neonatal hypoxic-ischemic encephalopathy. Antioxidants. 2021; 11: 39 https: //doi.org/10.3390/antiox11010039
20. Abate BB, Bimerew M, Gebremichael B, Mengesha Kassie A, Kassaw M, Gebremeskel T, et al. Effects of therapeutic hypothermia on death among asphyxiated neonates with hypoxic-ischemic encephalopathy: A systematic review and meta-analysis of randomized control trials. Schmölzer GM, editor. PLOS ONE. 2021; 16(2): e0247229.
https: //doi.org/10.1371/journal.pone.0247229
21. Diggikar S, Krishnegowda R. Therapeutic Hypothermia for Neonatal Encephalopathy in Low- and Middle-Income Countries: A Literature Review. Journal of Tropical Pediatrics. 2022; 68(2). https: //doi.org/10.1093/tropej/fmac016
22. Peeples ES, Rao R, Dizon MLV, Johnson YR, Joe P, Flibotte J, et al. Predictive Models of Neurodevelopmental Outcomes After Neonatal Hypoxic-Ischemic Encephalopathy. Pediatrics. 2021 Feb 1; 147(2).
https: //doi.org/10.1542/peds.2020-022962
23. Pilon B, Craig AK, Lemmon ME, Goeller A. Supporting families in their child's journey with neonatal encephalopathy and therapeutic hypothermia. Seminars in Fetal and Neonatal Medicine [Internet]. 2021 Oct 1 [cited 2022 Aug 10]; 26(5): 101278.
https: //doi.org/10.1016/j.siny.2021.101278

تقييم الممارسات والثغرات في تشخيص وإدارة ومتابعة المواليد الجدد المصابين باعتلال نقص التروية الدماغية في الأردن: دراسة استقصائية لأخصائيي الأطفال وحديثي الولادة في الأردن

إيمان ف. بدران[1]، أحمد رواجبة[2]، وسيم الحاج[2]، عبدالله القنج[3]، آلاء القهيوي[1]، رفيف قواسمة[4]،

مجد الحلقي[1]، محمد عسكر[4]، مريم الجمال[4]

[1] قسم طب الأطفال، كلية الطب، الجامعة الأردنية، عمان، الأردن

[2] قسم الجراحة، كلية الطب، الجامعة الأردنية، عمان، الأردن

[3] قسم التخدير، كلية الطب، الجامعة الأردنية، عمان، الأردن .

[4] كلية الطب، الجامعة الأردنية، عمان، الأردن.

Received: October 25, 2023
Accepted: January 1, 2024

DOI:
https://doi.org/10.35516/jmj.v59i2.1907

الملخص

الخلفية والاهداف: تحديد الثغرات في الرعاية لدى حديثي الولادة المصابين بنقص التروية الدماغية، وتقييم الممارسات المتّبعة في هذا المجال من قبل أطباء الأطفال وحديثي الولادة في الأردن. وقد تم تسليط الضوء على أثر نقص التروية الدماغية باعتبارها السبب الرئيسي الرابع لوفيات الرضع في الأردن .

منهجية الدراسة: أُجريت دراسة استقصائية شاملة لعدة قطاعات شملت 15 أخصائي حديثي ولادة و42 أخصائيًا في طب الأطفال في الأردن. واستُخدم فيها استبيان مكون من 35 بندًا لجمع بيانات عن الديموغرافيا ومعايير التشخيص وطرق العلاج وخدمات المتابعة .

النتائج: أفاد المشاركون في الدراسة بأن 70 في المائة منهم استخدموا مقياس أبغار Apgar score في تقييم الوليد، بالإضافة لاتباعهم نظام SARNAT لتقييم شدة التعرض لنقص التروية الدماغية لدى حديثي الولادة المصابين. كما أفاد المشاركون في الدراسة إلى أن 30 في المائة من المواليد الجدد المصابين احتاجوا النقل إلى وحدة العناية المركزة، في حين أن 70 بالمائة من المواليد المصابين أجري لهم التبريد العلاجي في غضون 6 ساعات، واستمر هذا العلاج لمدة 72 ساعة في 63.2 في المائة منهم. ومن النتائج أيضا أنه كان هناك وصول محدود لتصوير الدماغ لدى هؤلاء الأطفال.

الاستنتاج: من أجل تحسين رعاية المواليد في الأردن، يوصى بوضع مجموعة من الممارسات والإرشادات المنظمة لاتباعها في حالات نقص التروية الدماغية لدى حديثي الولادة.

الكلمات الدالة: حديثي الولادة، اعتلال نقص التروية الدماغي ، التبريد العلاجي، النتيجة.