Contributors to the neonate's death in the intensive care unit

Ahmed Mustafa Kamal (FICMS)[1] , Khalid Zuhair Naama (CAB,Neonatology)[2] ,Hossam Subhi Talab (CAB,Neonatology)[3]

[1,2,3] Children Welfare Teaching Hospital, Medical City, Baghdad, Iraq

Abstract

Background: Iraq had the third-greatest neonatal mortality rate in the Middle East in 2021 with 14 fatalities per 1,000 live births.
Objective: To investigate factors contributing to poor outcomes in the neonatal intensive care unit.
Patients and Methods: A retrospective cohort study conducted between 1 April to 31 September 2022 involved 632 neonates. Required data and outcomes were collected using predesigned forms.
Results: The mortality rate in NICU was 23.9%, with 64.9% of deaths occurring within the first six days. The overall mortality rate was 38.5 per 1000 live births. Deceased neonates had significantly lower gestational age and birth weight (P<0.001). Prematurity, respiratory distress syndrome, and congenital anomalies contributed to 94%, 73.5%, and 20.5% of deaths respectively. Mortality was significantly higher in patients with RDS 111(56.3%; P<0.001), pulmonary hemorrhage nine (100%; P<0.001), sepsis 26 (74.3%; P<0.001), and chorioamnionitis nine (100%, P=0.002). Newborns delivered vaginally had a 4.11 times higher likelihood of poor outcomes compared to cesarean deliveries.
Conclusion: Most NICU deaths resulted from prematurity and respiratory distress syndrome. Enhancing healthcare personnel skills, standardizing protocols, and evidence-based practices for preterm and respiratory 0distress syndrome management can help reduce neonatal mortality rates in Iraq.
Keywords: Neonatal intensive care unit, mortality, Iraq, outcome

Introduction

The rate of decline in neonatal mortality has been unsatisfactory and slower compared to the reduction in overall child mortality, especially in African countries. Each year, globally, four million newborns die within the first four weeks of life. Neonatal mortality accounts for approximately two-thirds of the infant mortality rate and one-third of deaths in children under five worldwide [1,2,3].

Neonatal intensive care units (NICUs) have a crucial role in providing specialized care to vulnerable infants, such as preterm newborns and those with congenital malformations or birth asphyxia [4]. According to the World Health Organization (WHO), approximately 11.1% of babies are born prematurely worldwide each year. Despite advancements in the survival rates of very low birth weight infants, the outlook for extremely low birth weight neonates remains unfavorable, even in well-equipped facilities [5]. Unfortunately, countries with limited resources often face higher mortality rates among preterm infants.

Moreover, managing NICUs within hospitals is a complex and costly endeavor [6]. Patient load, place capacity, and the quality of care all contribute to neonatal outcomes) [7].

There is a scarcity of information regarding neonatal outcomes in Iraq. The objective of the present study is to investigate the morbidities and identify the factors contributing to poor outcomes in a NICU within a referral maternity hospital.

Patients and Methods

Study protocol

This is a retrospective study conducted in the NICU of Baghdad Teaching Hospital which receives inpatients in the maternity department. The unit consists of five open care (resusciter word) and two closed care wards each consisting of 19 beds (incubators) with pulse-oximetry monitors, electronic infusion pumps, and syringe pumps for feeding. The words are provided by six neonatal ventilators and 13 continuous positive airway pressure (CPAP) machines with facilities for surfactant administration and exchange transfusion.

Study population

Details of all NICU admissions were collected in a predesigned proforma from the period of 1st April to 31st September 2022. Neonatal details including age, gender, birth weight, gestation, diagnosis at admission, hospital course, and outcome were recorded in predesigned proforma. Infants more than 30 days were excluded from the study.

Study design

Full-term newborns are defined as infants who have completed a gestational period ranging from 38 weeks to less than 42 completed weeks. Extreme preterm births refer to infants delivered before 28 weeks of gestation, while very early preterm births encompass the range of 28 to 30 weeks plus 6 days. Infants born between 31 and 33 weeks plus 6 days are classified as early preterm, and those delivered between 34 and 36 weeks plus 6 days are categorized as late preterm. Infants born at 37 to 38 weeks plus 6 days are considered early term [8].

Birth weight was classified as normal (NBW) when an infant's birth weight exceeded 2500 grams. The low birth weight (LBW) category includes infants with a weight ranging from 2500 to 1500 grams. Infants weighing between 1000 and 1500 grams fall into the very low birth weight (VLBW) category, while those weighing less than 1000 grams are classified as extremely low birth weight (ELBW).

The Apgar score was used to assess the physical condition of neonates. The assessment consisted of designating numeric values (0 to 2) to five criteria, including heart rate, respiratory effort, muscle tone, response to stimulation, and skin color. At one and five minutes after birth, the Apgar score was recorded and may be repeated after 5 min if the score was less than 6. A score between 8 and 10 indicated the best potential condition, whereas a score of 6 at five minutes suggested a moderately abnormal condition. For term and late-preterm infants, a 5-minute Apgar score of 7 to 10 was categorized as reassuring, a score of 4 to 6 as moderately aberrant, and a score of 0 to 4 as low [9]. Resuscitation was performed following neonatal resuscitation program (NRP-8) guidelines [10].

Statistical Analysis

All statistical analyses were conducted using Statistical Package for Social Sciences

for Windows version 25 (IBM Corp., Armonk, New York, United States). The frequency and percentages were used to present observational data and continuous variables were expressed as mean standard deviation (SD) or range. As applicable, statistical comparisons were conducted using Chi-square and Mann-Whitney tests. The odds ratio (OR), and 95% confidence interval were calculated using univariate logistic regression. A P value less than 0.05 was statistically significant.

Results

A total of 632 patients were included in the study. The mean gestational age of patients admitted to NICU was 34.16 ±3.471, full term accounted for only 3.8%. More than a third (38.9%) were late preterm and 23.9% were early term. The number of female admissions was close to that of males with male to female ratio of 1.2: 1. The majority (83.5%) of admitted patients were delivered by cesarean section (CS) compared to 104 (16.5%) who were delivered vaginally. The mean weight of the patients at the time of admission was 2273.76 ± 791.4460 gm, 51.1% had birth weight less than 2500 grams. VLBW accounted for 74 (11.7%) and ELBW was reported in 19 (3%). Multiple pregnancies represented 9.7% of the cohort, twin accounted for 56 (8.9%).

Transient tachypnea of the newborn (TTN) and respiratory distress syndrome (RDS) were seen in 51.4% and 31.2% of the cases respectively. Congenital anomalies were diagnosed in 56 (8.9%) and sepsis in 35 (5.5%). Patients' demographics and clinical diagnosis are detailed in Table (1).

Table(1): Patient demographics and characteristics

	Variable	Frequency	Percent
Gestational age (week)	Mean ± SD 34.16±3.471		
	Extreme preterm	34	5.4%
	Very Early preterm	101	16%
	Early preterm	76	12%
	Late preterm	246	38.9%
	Early term	151	23.9%
	Full term	24	3.8%
Sex	Female	284	44.9%
	Male	348	55.1%
Type of delivery	NVD	104	16.5%
	CS	528	83.5%
	Mean ± SD 2273.76 ± 791.4460		
	Extremely low BW	19	3%
	Very low BW	74	11.7%
Birth weight (gm)	Low BW	230	36.4%
	Normal BW	300	47.5%
	Macrosomia	9	1.4%
Type of pregnancy	Singleton	588	93%
	Twin	42	6.6%
	Triplet	2	0.3%
	prematurity	560	88.60%
	TTN	325	51.40%
Cause of admission	RSD	197	31.20%
	air leak/pneumothorax	12	1.90%
	Pulmonary hemorrhage	9	1.40%
	Low BW	74	11.70%
	asphyxia	6	0.90%
	Sepsis	35	5.50%
	hypoglycemia	6	0.90%
	Jaundice	4	0.60%
	congenital anomaly/chromosomal	56	8.90%
	others	15	

* Abbreviations: NVD: normal vaginal delivery; CS: cesarian delivery; BW: birth weight; TTN: transient tachypnea of neonate; RDS:respiratory distress syndrome

Maternal characteristics are summarized in Table 2. The mean age of the mothers was 29.34 ± 6.49 years ranging between 16 and 52 years. Maternal mean gravida was 4.09± 2.048 ranging between 1 and 14, and the rate of previous CS was 74.1% with a mean of 2.2± 1.78 ranging between 1-7.

Table (2): Maternal demographics and characteristics

Variable	Mean	±Std. Deviation
Age of the mother (year)	29.34	±6.494
Previous CS	2.2	±v.779
Gravida	4.64	±2.48
Para	4.09	±2.048
Abortion	0.68	±1.237
Maternal medical history	Frequency	Percentage
Infection	13	5.30%
HBV	6	46.20%
HCV	2	15.40%
TORCH	1	7.70%
Toxoplasmosis	1	7.70%
HIV	1	7.70%
Meningitis	2	15.4%
Gestational HT	87	35.70%
PE	8	3.30%
Chronic HT	52	21.30%
Gestational DM	39	16.00%
DM	40	16.40%
Thyroid disease	23	9.30%
Hypothyroidism	19	82.6%
hyperthyroidism	4	17.4%
chorioamnionitis	3	1.20%
Asthma	16	6.60%
Epilepsy	5	2.00%
SLE	6	2.50%
Cardiac diseases	2	0.80%
Others	10	4.10%
CRF	1	0.2%
CVA	1	0.2%
Depression	1	0.2%
DVT	2	0.3%
ITP	1	0.2%
Myasthenia gravis	1	0.2%
Peptic ulcer	1	0.2%
Trauma	1	0.2%
UTI	1	0.2%

* Abbreviations: CS: cesarian delivery; HBV: hepatitis B virus, HCV: Hepatitis C virus; TORCH: toxoplasmosis, rubella, cytomegalovirus, and herpes simplex; HT: hypertension; PE: pre-eclampsia; DM: diabetes mellitus SLE: systemic Lupus erythematosus; CRF: chronic renal failure; CVA: cerebrovascular accident; DVT: deep venous thrombosis; ITP: idiopathic thrombocytopenic purpura; UTI: urinary tract infection.

Two hundred and sixty-three (41.6%) of the mothers had experienced at least one medical condition during or before their current pregnancy as listed in Table 2. Gestational hypertension was the most prevalent, reported by 35.7% of the mothers followed by chronic hypertension in 21.3%, DM in 16.4%, and gestational DM in 16%. Four hundred fifty-three (6838%) of the patients were discharged home well and 46 (7.3%) were referred either for weight gain or surgical units. The death rate in NICU patients was 151 (23.9%), 64.9% occurred in the first 6 days while 35.1% occurred later. Total living births during the study period was 3920, thus morality rate was 38.5 per 1000 living births.

As Table (3) shows, there was no significant difference in the outcome in terms of gender. The mean gestational age and BWT of deceased patients were significantly lower than those who were discharged or referred. Among the total deaths recorded, extreme preterm births accounted for 31 (21%) and very early preterm births accounted for 59 (39%) cases. The mortality rate among extremely preterm infants was significantly higher, with 91% of them passing away compared to only 9% who survived (P<0.001). Very low birth weight infants contributed to 32% of total mortality, while ELBW infants accounted for 12%. The survival rate for VLBWT infants was 34%, whereas for ELBW infants, it was only 5%, with the majority unfortunately not surviving (P<0.001).

Prematurity, RDS, and congenital anomalies were the primary contributors to mortality, accounting for 97%, 73%, and 20% respectively. All patients diagnosed with pulmonary hemorrhage, 26 (73.4%; P<0.001) of those with sepsis, 111(54.3%, P<0.001) of those with RDS, and 7 (58.3%. P=0.010) died. Gestational hypertension, gestational diabetes mellitus, and chronic hypertension were associated with 31.6%, 22.8%, and 12.3% of neonatal deaths respectively. All pregnancies complicated by chorioamnionitis resulted in neonatal death (P=0.002). Additionally, a higher proportion of patients who received surfactant treatment did not survive (69%) compared to those who improved and were discharged (31%) (P<0.001). Patients who did not survive had significantly lower Apgar scores at 5 minutes (mean of 3.00 ± 1.73) compared to those who survived (mean of 3.7 ± 1.25) (P<0.001). Similarly, survivor scores at 10 minutes were significantly higher (P=0.002).

Diyala Journal of Medicine

Table (3): patients and maternal characteristics according to the outcome

Variables		Total	Outcome				P value
			Dead (N=151)		Discharged/ referred (n=481)		
			No	%	No	%	
gender	Female	284	68	45%	216	45%	1.000
	Male	348	83	55%	265	55%	
Gestational age	Mean (±SD)		30.91	4.10	35.19	2.49	<0.001
	Extreme preterm	34	31	21%	3	1%	<0.001
	Very Early preterm	101	59	39%	42	9%	
	Early preterm	76	20	13%	56	12%	
	Late preterm	246	21	14%	225	47%	
	Early term	151	15	10%	136	28%	
	Full term	24	5	3%	19	4%	
Birth weight (gm)	Mean (±SD)		1785.71	719.79	2480	910.19	<0.001
	Extremely low BW	19	18	12%	1	0%	<0.001
	Very low BW	74	49	32%	25	5%	
	Low BW	230	54	36%	176	37%	
	Normal BW	300	29	19%	271	56%	
	Macrosomia	9	1	1%	8	2%	
Mode of delivery	NVD	104	51	34%	53	11%	<0.001
	CS	528	100	66%	428	89%	
Cause of admission	Prematurity	560	142	94.00%	418	86.90%	0.018
	LBW	74	7	4.60%	67	13.90%	0.002
	TTN	325	3	2.00%	322	66.90%	<0.001
	RSD	197	111	73.50%	86	17.90%	<0.001
	Air leak/ pneumothorax	12	7	4.60%	5	1.00%	0.010
	Pulm. hemorrhage	9	9	6.00%	0	0.00%	<0.001
	Sepsis	35	26	17.20%	9	1.90%	<0.001
	Hypoglycemia	6	0	0.00%	6	1.20%	0.344
	Asphyxia	6	1	0.70%	5	1.00%	0.677
	Jaundice	4	0	0.00%	4	0.80%	0.261
	congenital anomaly/chrom.	56	31	20.50%	25	5.20%	0.018
	Others	15	4	2.60%	11	2.30%	0.243
maternal medical history	Gestational HT	87	18	31.60%	69	36.30%	0.451
	PE	8	1	1.80%	7	3.70%	0.447
	Chronic HT	52	7	12.30%	45	23.70%	0.066
	Gestational DM	39	13	22.80%	26	13.70%	0.153
	DM	40	7	12.30%	33	17.40%	0.327
	Thyroid disease	23	4	7.00%	19	10.00%	0.456

	Infection	13	3	5.30%	10	5.30%	0.944
	Chorioamnionitis	3	3	5.30%	0	0.00%	0.002
	Asthma	16	6	10.50%	10	5.30%	0.196
	Epilepsy	5	0	0.00%	5	2.60%	0.598
	SLE	6	2	3.50%	4	2.10%	0.586
	Cardiac	2	0	0.00%	2	1.10%	1.000
	Others	10	3	5.30%	7	3.70%	0.437
Surfactant administration	No	564	104	69.4%	460	95.8%	<0.001
	Yes	66	46	30.6%	20	4.2%	
Apgar score at	1 min	632	1.14	0.69	1.20	0.79	0.421
	5 min	632	3.00	1.73	3.7	1.25	<0.001
	10 min	127	4.00	1.83	5.2	1.32	0.002
	15 min	17	4.71	2.21	6.2	1.23	0.161

* Abbreviations: CS: cesarian delivery; HBV: hepatitis B virus, HCV: Hepatitis C virus; TORCH: toxoplasmosis, rubella, cytomegalovirus and herpes simplex; RDS: respiratory distress syndrome; SLE: systemic Lupus erythematosus; HT: hypertension; DM: Diabetes; PE: pre-eclampsia; CRF: chronic renal failure; CVA: cerebrovascular accident; DVT: deep venous thrombosis; ITP: idiopathic thrombocytopenic purpura; UTI: urinary tract infection.

A univariate logistic regression was performed to determine the effect of the parameters listed in Table 4 on the likelihood of having a dismal outcome. Newborns who delivered normally were 4.11 times more likely to have poor outcomes compared to those delivered by CS while patients who did not receive surfactant were less likely to die in comparison to those who did (OR= 0.101, 95% C.I., 0.058-0.176), 37.3% of them were extreme preterm and 43.1% were very early preterm births. Increasing maternal age, fetal BW, and Apgar score at 5 min were associated with a reduced likelihood of poor outcomes. Additionally, maternal medical history was associated with a higher chance of neonatal mortality however that was statistically not significant.

Table (4): Predictors of death in NICU admission

Factor	OR	P value	95% C.I.	
			Lower	Upper
Age of the mother (year)	0.942	<0.001	0.914	0.971
Mode of delivery				
NVD	4.118	<0.001	2.648	6.406
CS	reference			
BW	0.998	<0.001	0.998	0.999
GA	0.689	<0.001	0.634	0.726
Maternal illness				
Present	1.059	0.762	0.730	1.53
Absent	reference			
Apgar score 5min	0.532	<0.001	0.457	0.598
Surfactant				
No	0.101	<0.001	0.058	0.176
Yes	reference			

* Abbreviations: OR: odd ratio; NVD: normal vaginal delivery; CS: cesarian delivery; BW: birth weight; GA: gestational age.

Discussion

In developing countries, neonatal mortality rates continue to be substantially higher than in developed nations. Following Yemen and Algeria, Iraq had the third-greatest neonatal mortality rate in the Middle East in 2021, with 14 fatalities per 1,000 live births[11]. This study identifies the causes of mortality in neonatal intensive care units (NICUs) as a measure of the quality of care provided to these newborns in healthcare facilities.

Mortality rates in NICU admission vary considerably across centers and counties; a recent Brazillian study reported 11% [12] while another study conducted in Iran reported a 38% mortality rate [13]. In the current study, mortality was 23.9% which accounted for 43 per 1000 live births. This is approximately double the rate reported by Rasheed et al, 19.3 per 1000 live births. The difference can be attributed to the fact that the current study center receives inpatients from a tertiary obstetric hospital dealing with complicated high-risk pregnancies. An earlier study conducted in the same center in 2009 reported an 18.5% mortality rate [14], however, the center at that time had less capacity and most of the patients were referred before admission. This increase can also be justified by the difference in study design and the higher number of premature and low birth weights in the current study.

The majority (83.5%) of the admitted patients were from CS deliveries and (66.6%) had a gestational age of more than 33 weeks. This observation aligns with the growing prevalence of surgical deliveries in Iraq [15]. The survival rate, however, was significantly lower amongst those who were delivered vaginally (11%) and patients were 4.1 times more likely to have poor outcomes compared to those delivered by CS. Taking into consideration that all these normal deliveries took place at tertiary maternity centers, most of the mortality was among extreme preterm 37.3% and very early preterm 43.1% births. The survival rate in these two categories is typically low and varies between 62 in both England and China and 72% in the US [16, 17].

The topmost contributors to mortality in this study were prematurity 94%, RDS 73%, and congenital anomalies 20.5%. Prematurity was the main cause of admission in this study accounting for 88.6% of all admissions. Similar findings were described by several Iraqi studies [18-20] and Adhikari et al. who reported 60% of patients with poor outcomes had prematurity complications [11]. It is well-established that infant mortality rates rise proportionately with decreasing gestational age or birth weight, making preterm newborns more likely to die during neonatal (first 28 days) and infancy (first year) than full-term infants.

In Iraqi studies focusing on the outcomes of neonates, respiratory distress syndrome (RDS) emerged as the primary cause of mortality [18-21]. The incidence of RDS is negatively correlated with gestational age in premature neonates [22]. It is established that RDS is uncommon in full-term neonates and occurs less frequently in infants delivered between 33 and 36 weeks of gestation [23]. In the context of this study, all cases of RDS were confined to premature neonates, and more than half of them had unsatisfactory outcomes. In particular, 73% of these cases were born prior to 32 weeks gestation.

Management of RDS requires specific interventions such as CPAP or exogenous surfactant through an endotracheal tube which can improve pulmonary gas exchange and reduce mortality [24]. Surfactant treatment was administered to 33.3% of the patients diagnosed with RDS in this study. Twenty patients (30%) among those who received surfactant survived. Notably, 50% of the patients who received surfactant were classified as extremely premature, and 30.7% as very early premature. Hence, patients who did not receive surfactant in the current study had a lower mortality risk than those who did, with an odds ratio of 0.409% (95% confidence interval: 0.184-0.91). Pulmonary hemorrhage was identified as the most prevalent complication in this patient population. A recent local study evaluated surfactant therapy using the INSURE method and concluded that failure rate, (38%), was associated with lower birth weight, lower gestational age, lower Apgar score at 5 minutes, and prolonged administration [21].

Sepsis is one of the principal causes of death in newborns, however, it is a condition that can be significantly controlled. In the current study, sepsis accounted for 17.2% of all neonatal mortality. While this percentage is relatively high, it falls within the range reported in previous studies conducted in Iraq, which have reported rates between 1.2% and 33.6% [18, 20, 25]. Unfortunately, the outcomes for neonates with sepsis are often poor, with mortality rates reaching up to 75%. In a study conducted by Al-Shawi et al., it was identified that prematurity, low birth weight, and prolonged rupture of membranes were significantly associated with bacterial infections in neonates. Additionally, the researchers highlighted the role of factors such as oxygen therapy, invasive procedures, and the use of nasogastric tubes as significantly contributing to the risk of infection[19]. These findings emphasize the importance of careful management and monitoring of these factors to prevent and control infections in neonates.

Conclusions

The high mortality rate in the NICU is predominantly attributed to prematurity and RDS. To address this, it is imperative to improve the quality of neonatal care at the facility level. This involves enhancing the skills and knowledge of healthcare providers and implementing standardized protocols and evidence-based guidelines for managing prematurity, RDS, and other prevalent neonatal conditions.

Recommendations

By prioritizing these measures, better consistency and quality of care can be achieved, leading to improved outcomes and reduced neonatal mortality rates.

Ethical clearance: This study was approved by the Ethics Committee of the Medical City Directorate and Baghdad Teaching Hospital

Conflict of interest: Nil

References

[1] World Healthorganization. Newborn Mortality. 2022 [cited 2023 May].

[2] Jehan, I., Harris, H., Salat, S., Zeb, A., Mobeen, N., Pasha, O., et al., Neonatal mortality, risk factors and causes: a prospective population-based cohort study in urban Pakistan. Bulletin of the world Health Organization 2009; 87: p. 130-138.

[3] Lawn, J.E., Cousens, S., and Zupan, J., 4 million neonatal deaths: when? Where? Why? Lancet 2005; 365: p. 891-900.

[4] Organization, W.H. Born too soon: the global action report on preterm birth. 2012.

[5] Tagare, A., Chaudhari, S., Kadam, S., Vaidya, U., Pandit, A., and Sayyad, M.G., Mortality and Morbidity in Extremely Low Birth Weight (ELBW) Infants in a Neonatal Intensive Care Unit. The Indian Journal of Pediatrics 2013; 80: p. 16-20. https://doi.org/10.1007/s12098-012-0818-5.

[6] Xie, L., Boudreaux, M., and Franzini, L., Maryland's Global Budget Revenue Program: Impact on Neonatal Intensive Care Unit Admissions and Infant Mortality. Med Care 2021; 59: p. 663-670.

[7] Unicef. Neonatal mortality. 2023 [cited 2023 May].

[8] Romero, R.J., Chaiworapongsa, T., Gotsch, F., Yeo, L., Madan, I., and Hassan, S.S., The diagnosis and management of preterm labor with intact membranes. Clinical Maternal-Fetal Medicine Online 2021.

[9] Committee On, F., Newborn, A., Committee on Obstetric, P., and American Academy Of, P., ACOG Committee Opinion. Number 333, May 2006 (replaces No. 174, July 1996): The Apgar score. Obstetrics and gynecology 2006; 107: p. 1209-1212.

[10] Qureshi, M.J. and Kumar, M., Laryngeal mask airway versus bag-mask ventilation or endotracheal intubation for neonatal resuscitation. Cochrane Database Syst Rev 2018; 3: p. Cd003314.

[11 Adhikari, S., Rao, K.S., B, K.G., and Bahadur, N., Morbidities and Outcome of a Neonatal Intensive Care in Western Nepal. J Nepal Health Res Counc 2017; 15: p. 141-145.

[12] Moura, B.L.A., Alencar, G.P., Silva, Z.P.D., and Almeida, M.F., Factors associated with hospitalization and neonatal mortality in a cohort of newborns from the Unified Health System in São Paulo. Rev Bras Epidemiol 2020; 23: p. e200088.

[13] Ashrafzadeh, M., Farahani, A.S., Rassouli, M., Shariat, M., Nasiri, M., and Faridpor, F., The prediction of mortality risk in preterm infants hospitalized in the neonatal intensive care unit using SNAPPE-II score system. Journal of Comprehensive Pediatrics 2019; 10.

[14] Hameed, N.N. and Abed, B.N., Descriptive Study of Neonatal Death in Neonatal Care Unit of Baghdad Teaching Hospital / Medical city / Baghdad (2007-2009). Journal of the Faculty of Medicine Baghdad 2012; 54: p. 214-217. https://iqjmc.uobaghdad.edu.iq/index.php/19JFacMedBaghdad36/article/view/720.

[15] Ministry of Health (Iraq), Iraq Annual Statistical Report 2019. 2020.

[16] Costeloe, K.L., Hennessy, E.M., Haider, S., Stacey, F., Marlow, N., and Draper, E.S., Short term outcomes after extreme preterm birth in England: comparison of two birth cohorts in 1995 and 2006 (the EPICure studies). Bmj 2012; 345.

Diyala Journal of Medicine

[17] Zhu, Z., Yuan, L., Wang, J., Li, Q., Yang, C., Gao, X., et al., Mortality and Morbidity of Infants Born Extremely Preterm at Tertiary Medical Centers in China From 2010 to 2019. JAMA Network Open 2021; 4: p. e219382-e219382. https://doi.org/10.1001/jamanetworkopen.2021.9382.

[18] Rasheed, H.A., Al Jadiry, H., and Al-Kaseer, E.A., Neonatal mortality rates at Al-Sadar city 2015–2019. Technium BioChemMed 2022; 3: p. 74-80.

[19] Al-Shawi, B.A., Al-Hadithi, T., Al-Abasi, A.-R., and Al-Diwan, J.K., Neonatal infection in the neonatal unit at Baghdad Teaching Hospital, Iraq. Iraqi Postgraduate Med J 2006; 5: 295 2006; 297.

[20] Alsadi, E., Comparison study of causes and neonatal mortality rates of newborns admitted in neonatal intensive care unit of Al-Sadder Teaching Hospital in Al-Amara City, Iraq. International Journal of Pediatrics 2017; 5: p. 4601-4611.

[21] Hashim, Q.M., Al Aasam, A.I., Alwan, H.M.O., and Nasrawi, A.J., Effect of surfactant replacement therapy in preterm with respiratory distress syndrome in low sources center Al-Zahraa teaching Hospital at Al-Najaf city-Iraq. Current Pediatric Research 2021; 25.

[22] Rocha, G., Flor De Lima, F., Riquito, B., and Guimarães, H., Very preterm infant outcomes according to timing of birth. J Neonatal Perinatal Med 2020; 13: p. 97-104.

[23] Clark, R., Powers, R., White, R., Bloom, B., Sanchez, P., and Benjamin, D.K., Jr., Prevention and treatment of nosocomial sepsis in the NICU. J Perinatol 2004; 24: p. 446-53.

[24] Sweet, D.G., Carnielli, V.P., Greisen, G., Hallman, M., Klebermass-Schrehof, K., Ozek, E., et al., European Consensus Guidelines on the Management of Respiratory Distress Syndrome: 2022 Update. Neonatology 2023; 120: p. 3-23.

[25] Mehmoud, M.T. and Al-Khudhairi, J., Trends in Neonatal Mortality Rates in Iraq During the Period of 2008-2017. Iraqi Postgraduate Medical Journal 2021; 20.

Diyala Journal of Medicine

أسباب وفاة حديثي الولادة في وحدة العناية المركزة

احمد مصطفى كمال¹ ، خالد زهير نعمة ² ، حسام صبحي طالب ³

الملخص

خلفية الدراسة: للعراق ثالث أعلى معدل وفيات حديثي الولادة في الشرق الأوسط في عام ٢٠٢١ بمعدل ١٤ حالة وفاة لكل ١٠٠٠ ولادة حية.

اهداف الدراسة: التحقيق في العوامل التي تسهم في النتائج السيئة في وحدة العناية المركزة لحديثي الولادة.

المرضى والطرائق: دراسة متابعة أجريت بين ١ أبريل إلى ٣١ سبتمبر ٢٠٢٢ تضمنت ٦٣٢ وليدًا ، باستثناء أولئك الذين تزيد أعمارهم عن ٣٠ يومًا. تم جمع البيانات المطلوبة والنتائج باستخدام نماذج مسبقة التصميم.

النتائج: بلغت معدل الوفيات في ردهة العناية المركزة ٢٣,٩٪ ، مع وقوع ٦٤,٩٪ من الوفيات خلال الساعات الست الأولى. كان معدل الوفيات الإجمالي ٣٨,٥ لكل ١٠٠٠ ولادة حية. كان حديثي الولادة المتوفين لديهم عمر حمل ووزن عند الولادة أقل بشكل ملحوظ ($P < 0.001$). ساهمت الولادات المبكرة ومتلازمة الضائقة التنفسية والعيوب الخلقية في ٩٤٪ و ٧٣,٥ و ٢٠,٥٪ من الوفيات على التوالي. كان معدل الوفيات أعلى بشكل ملحوظ في المرضى الذين يعانون من متلازمة الضائقة التنفسية (٥٦,٣٪) ١١١، $P < 0.001$ ونزيف رئوي ٩ (١٠٠٪) ؛ $P < 0.001$ ، والتهاب صمامات القلب ٢٦ (٧٤,٣٪) $P < 0.001$ ، والتهاب المشيماء والحويصلات الأريمية ٩ (١٠٠٪) ، $P = 0.002$. كان حديثو الولادة الذين تمت ولادتهم مهبلياً لديهم ٤,١١ مرة أكثر عرضة للنتائج السيئة مقارنة بالولادات القيصرية.

الاستنتاجات: نتج معظم وفيات ردهة العناية المركزة عن الولادات المبكرة و متلازمة الضائقة التنفسية يمكن أن تساعد تحسين مهارات العاملين في مجال الرعاية الصحية وتوحيد البروتوكولات والممارسات القائمة على الأدلة لإدارة الخدج و متلازمة الضائقة التنفسية في خفض معدلات وفيات حديثي.

الكلمات المفتاحية: وحدة العناية المركزة لحديثي الولادة ، الوفيات ، العراق ، النتائج.

البريد الالكتروني: amk.researchmed@gmail.com

تاريخ استلام البحث: ٣ آب ٢٠٢٣

تاريخ قبول البحث: ١٩ أيلول ٢٠٢٣

---

³،²،¹ مستشفى حماية الاطفال التعليمي ـ مدينة الطب ـ بغداد ـ العراق