



PERINATAL MORTALITY IN AL-YARMOUK TEACHING HOSPITAL DURING 2019

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ABSTRACT

Background: Total perinatal deaths are perinatal mortality. This includes stillbirth and early neonatal mortality (live newborn death before seven days). In hospitals, many perinatal deaths can be averted. Improved intrapartum care might save 1.3 million intrapartum fatalities and a high percentage of early neonatal mortality worldwide. Study goals: To estimate perinatal mortality in Al-Yarmouk Teaching Hospital in 2019, determine its primary causes, and examine the association between gestational age, number of fetuses, mother age, gender, mode of delivery, and birth weight. **Methods:** A retrospective cross-sectional study in which a review of all records at the Registration Unit and Neonatal Department of AL-Yarmouk Teaching Hospital during 2019 was performed. **Results:** In 2019, AL-Yarmouk Teaching Hospital reported 11,790 live births, with a Neonatal Mortality Rate of 36.5/1000 live births, primarily due to Respiratory Distress Syndrome. Among the 1,680 neonates admitted to the Neonatal Care Unit, 430 died, with most deaths occurring within the first week. The study also found that death causes were significantly associated with birth weight but not with gender or mode of delivery. **Conclusion:** AL-Yarmouk Teaching Hospital had a perinatal death rate of 47.5/1000 births, with a 36.5/1000 live birth, 33.1/1000 early live birth, and 14.9/1000 total birth stillbirth rate. RDS, extreme prematurity, various congenital abnormalities, birth asphyxia, and infection caused most perinatal fatalities. Low birth weight substantially predicted mortality. Causes of death were not significantly associated with gender, method of delivery, gestational age, or mother age.

KEYWORDS: Perinatal, Mortality, Al-Yarmouk, Teaching, Hospital, 2019.

INTRODUCTION

Globally, with over 130 million babies born annually, the reduction of infant and maternal mortality remains a pivotal development goal, as highlighted by various international initiatives such as the World Summit for Children (1990), the United Nations Millennium Declaration, and the United Nations Special Session on Children (2002).^[1,2,3] These efforts aim at developing strategies to reduce perinatal and neonatal mortality by understanding their magnitude for program development aimed at curtailing avoidable child deaths. In Iraq, the 2018 Ministry of Health Annual Statistical Report indicates perinatal mortality rate at 17.5 per 1000 total births, neonatal mortality rate at 13.8 per 1000 live births, infant mortality rate at 18.6 per 1000 live births, and stillbirth rate at 7.1 per 1000 total births.^[2] Interestingly, mortality rates were lower in the Kurdistan Region compared to other surveyed Iraqi districts. The definitions of live birth, stillbirth, and the classifications

of stillbirths (international vs. national criteria based on birth weight, gestational age, and body length) highlight the variability in how stillbirths are recorded and reported, complicating international comparisons.^[1,4] Stillbirths, categorized into antepartum (before labor) and intrapartum (during labor), carry significant psychological, social, and economic burdens.^[5] Notably, the global stillbirth rate is alarmingly high, with 2.6 million occurrences annually, predominantly in Low and Middle-Income Countries (LMIC), emphasizing the critical need for improved maternal and neonatal health care.^[6] Perinatal mortality, encompassing stillbirths and early neonatal deaths, is an essential indicator of maternal and neonatal health care quality. It remains a considerable public health concern, especially in developing countries, reflecting on maternal care, health, and nutrition, as well as the quality of obstetric and pediatric care available.^[7,8] Despite global efforts, significant challenges in reducing perinatal mortality

persist, as reflected in the Millennium Development Goals' limited success in reducing neonatal and fetal mortality rates.^[9,10] Neonatal deaths and stillbirths are primarily due to poor maternal health, inadequate pregnancy care, and lack of proper newborn care.^[11] Factors such as women's status, nutritional status at conception, and harmful cultural practices play a crucial role in these outcomes.^[11] Effective strategies to reduce perinatal mortality involve improving access to quality health care, especially during pregnancy and delivery, and enhancing newborn care. The document further outlines the causes of perinatal mortality, emphasizing that 99% of such deaths occur in LMICs.^[11,12] In regions with access to quality healthcare, congenital malformations, preterm birth, and intrauterine growth restriction are leading causes, whereas in areas with lower healthcare coverage, asphyxia, neonatal tetanus, and infections are predominant.^[4] Importantly, many perinatal deaths are preventable through improved care during labor and the immediate postnatal period.^[13,14] Moreover, the document touches upon the impact of maternal factors like age and gestational age on neonatal outcomes. Young maternal age and advanced maternal age are both associated with increased risks of adverse neonatal outcomes.^[15] Gestational age, a critical factor in neonatal health, is assessed through various physical and neuromuscular criteria to determine the maturity of the fetus accurately.^[16] Study goals: To estimate perinatal mortality in Al-Yarmouk Teaching Hospital in 2019, determine its primary causes, and examine the association between gestational age, number of fetuses, mother age, gender, mode of delivery, and birth weight.

METHOD

This retrospective cross-sectional study was conducted at the Neonatal Department of AL-Yarmouk Teaching Hospital during 2019, focusing on the comprehensive review of neonatal and stillborn records. The inclusion criteria covered all neonates born and admitted to the Neonatal Wards throughout 2019, as well as all stillborn fetuses who either completed 28 weeks of gestation or weighed more than 500 grams. The study's goal was to analyze various aspects of neonatal care, outcomes, and the characteristics of stillborn infants. Data collection was meticulously designed through a simple form, post review of official hospital records, to gather extensive information from the Statistical Unit and the Neonatal Care Unit of AL-Yarmouk Teaching Hospital. The collected data encompassed total and live births, stillbirths, modes of delivery (Normal Vaginal Delivery [NVD] and Cesarean Section [CS]), alongside detailed neonatal information including age, gender, maternal age, gestational age, birth weight, the number of fetuses, mode of delivery, reasons for admission, and causes of deaths. Additionally, data on stillborn infants, including gender, gestational age, and cause of death, were extracted from hospital registries. Ethical approval for conducting the study was obtained from both the Scientific Committee at the Department of Family and Community Medicine, College of Medicine, University

of Baghdad and the Scientific Committee at the Neonatal Department of AL-Yarmouk Teaching Hospital, with a strict adherence to confidentiality concerning the use of data for research purposes only. For the statistical analysis, the collected data were digitized and coded in an Excel file using Microsoft Office 2019 Professional Plus Edition on a Windows 10 Professional system. Analysis was conducted using the Statistical Package for the Social Sciences Version 24 (SPSS-24). The statistical approach involved presenting continuous variables as mean \pm Standard Deviation (SD) and categorical variables as frequency and relative frequency. The significance of associations between categorical variables was tested using the Chi-square test, with a P-value of less than 0.05 deemed to indicate statistical significance. This study aimed to provide a detailed overview of neonatal outcomes and stillbirth characteristics at AL-Yarmouk Teaching Hospital in 2019, using rigorous data collection and analysis methods. Through examining various factors such as birth weight, gestational age, mode of delivery, and causes of neonatal admissions and deaths, the study sought to identify significant associations and trends that could inform future neonatal care improvements and strategies to reduce mortality rates.

RESULTS

During 2019; 11790 live births took place at AL-Yarmouk Teaching Hospital, males (5911 (50.1%)) were slightly higher than females (5879) with a male to female ratio of nearly 1:1. Neonates who needed admission to the NCU were 1680; 927 males and 753 females with a male to female ratio of 1.2:1 (Table 1), 430 neonates died and the neonatal mortality rate was 36.5/1000 live birth. The gestational age (in weeks) of the studied neonates revealed that 49.2% were between 28-36 weeks (Table 1), the birth weight was below 2500 grams in 38% of the admitted neonates (Table 1) and the duration of admission was 7 days for 89.3% of the admitted (Table 1). Regarding their mother's age; it was found that 80.6% of the mothers were between 20-34 years (Table 1), nearly all the admitted neonates were singleton (Table 1), and 56.5% of them were delivered by CS (Table 1).

Table 1: Characteristics of the studied neonates.

Variables	No.	%
Gender		
Males	927	55.2
Females	753	44.8
Gestational age (in weeks)		
<28	64	3.8
28-36	827	49.2
37-42	789	47.0
Birth weight (in grams)		
<1000	68	4.1
1000-1499	158	9.4
1500-2499	412	24.5
\geq 2500	1042	62.0
Duration of admission (in days)		

≤ 7	1476	89.3
8-28	176	10.7
Age of the mothers (in years)		
<20	118	7.0
20-34	1353	80.6
≥ 35	209	12.4
Number of fetuses		
Singleton	1627	96.8
Multiple	53	3.2
Mode of delivery		
NVD	731	43.5
CS	949	56.5

On reviewing the causes of admission to the NCU; it was found that RDS was on the top of the list as seen in 40.8% of the admitted neonates followed by admission for observing hypoglycemia in 30.1% and the least was for birth asphyxia 2.1% and sepsis 1.4% (Table 2).

Table 2: Distribution of admissions by cause of admission.

Causes of admission	No.	%
RDS	685	40.8
Observation of hypoglycemia	505	30.1
Severe prematurity	191	11.4
TTN	109	6.5
Multiple congenital anomalies	86	5.1
Birth asphyxia	36	2.1
Sepsis	23	1.4
Others	45	2.7

On studying the association between gender and cause of admission to the NCU; table 3 showed that the association was statistically significant (P= 0.03).

Table 3: The association between causes of admissions and gender.

Causes of admission	Males		Females		Total	P-Value
	No.	%	No.	%		
RDS	399	58.2	286	41.8	685	0.03*
Observation of hypoglycemia	265	52.5	240	47.5	505	
Severe prematurity	96	50.3	95	49.7	191	
TTN	55	50.5	54	49.5	109	
Multiple congenital anomalies	42	48.8	44	51.2	86	
Birth asphyxia	23	63.9	13	36.1	36	
Sepsis	14	60.9	9	39.1	23	
Others	33	73.3	12	26.7	45	

*The association was statistically significant (Ψ^2 test= 15.7, DF=7)

Out of the 1680 neonates admitted to the NCU 430 died. The neonatal mortality rate was 36.5/1000 live birth. Among the deceased neonates; 55.8% were males, 71.9% were born between 28-36 weeks' gestation, the birth weight of 69.8% of them was less 2500g, 52.6% were delivered by CS, and the age of their mothers were between 20-34 years in 76.5% of them (Table 4). Most

of the deceased neonates (90.7%) died within their first week of life, the rate of early neonatal death was 33.1/1000 live birth and the rate of late neonatal death rate was 3.4/1000 live birth. Males were more than females among both early and late neonatal death (Table 4).

Table 4: Characteristics of the deceased neonates.

Variables	No.	%
Gender		
Males	240	55.8
Females	190	44.2
Gestational age (in weeks)		
<28	51	11.9
28-36	309	71.9
37-42	70	16.2
Birth weight (in grams)		
<1000	53	12.3
1000-1499	101	23.5
1500-2499	146	34.0
≥2500	130	30.2
Classification of neonatal death		
Early neonatal death ≤ 7	390	90.7
Late neonatal death 8-28	40	9.3
Age of the mothers (in years)	39	9.1

<20		
20-34	329	76.5
≥ 35	62	14.4
Number of fetuses		
Singleton	407	94.7
Multiple	23	5.3
Mode of delivery		
NVD	204	47.4
CS	226	52.6

Regarding causes of deaths; the study revealed that RDS was on the top of the list constituting 39.5% of the causes of death, followed by Severe prematurity in 26.3%, Multiple congenital anomalies in 8.8% and death because of sepsis were found in 4.9% only (Table 5). On studying the factors that might be associated with causes of death it was found that the association was statistically

not significant between causes of deaths and gender (P=0.27) (Table 5) and between causes of deaths and mode of delivery (P=0.095) (Table 6), yet the association was statistically significant between causes of death and birth weight of the deceased neonate (P <0.0001) (Table 7).

Table 5: Causes of death by gender.

Causes of death	Males		Females		Total		P-Value
	No.	%	No.	%	No.	%	
RDS	101	59.4	69	40.6	170	39.5	0.27*
Severe prematurity	57	50.4	56	49.6	113	26.3	
Multiple congenital anomalies	38	48.1	41	51.9	79	18.4	
Birth asphyxia	15	65.2	8	34.8	23	5.3	
Sepsis	13	61.9	8	38.1	21	4.9	
Others	16	66.7	8	33.3	24	5.6	

*The association was statistically not significant (Ψ^2 test= 6.4, DF=5).

Table 6: causes of death according to the mode of delivery.

Causes of death	NVD		CS		Total	P-value
	No.	%	No.	%		
RDS	71	41.8	99	58.2	170	0.095*
Severe prematurity	66	58.4	47	41.6	113	
Multiple congenital anomalies	37	46.8	42	53.2	79	
Birth asphyxia	8	34.8	15	65.2	23	
Sepsis	11	52.4	10	47.6	21	
Others	11	45.8	13	54.2	24	

*The association was statistically not significant (Ψ^2 test= 9.37, DF=5)

Table 7: causes of death according to birth weight.

Causes of death	Birth weight in grams				Total No.	P-value
	< 2500		≥2500			
	No.	%	No.	%		
RDS	118	69.4	52	30.6	170	<0.0001*
Severe prematurity	109	96.5	4	3.5	113	
Multiple congenital anomalies	42	53.2	37	46.8	79	
Birth asphyxia	5	21.7	18	78.3	23	
Sepsis	16	76.2	5	23.8	21	
Others	10	41.7	14	58.3	24	

*The association was statistically significant (Ψ^2 test= 83.1, DF=5)

Regarding stillborn during the study period, 178 babies were stillborn 50.6% were females. The stillbirth rate was estimated to be 14.9/1000 total birth and the perinatal death rate was 47.5/1000 total births. Because of missing information nine stillborn fetuses were excluded from analysis regarding gestational age and mode of delivery. Among the remaining 169 stillborn

fetuses, 71.9% of them were delivered between 28-36 weeks' gestation and 51.5% were delivered by CS. (Table 8), the association was statistically not significant between gestational age and gender (P value=0.15) (Table 9), and between mode of delivery and gender (P value=0.95) (Table 10).

Table 8: Characteristics of the stillborn.

Variables	No.	%
Gender		
Males	88	49.4
Females	90	50.6
Gestational age (in weeks)*		
<28	9	11.9
28-36	120	71.9
37-42	40	16.2
Mode of delivery*	87	51.5
CS NVD	82	48.5

*The data of nine stillborn were missing.

Table 9: stillbirths according to gestational age and gender.

Gestational Age	Males		Females		Total	P-value
	No.	%	No.	%	No.	
<28	2	22.2	7	77.8	9	0.15**
28-36	57	47.5	63	52.5	120	
37-42	23	57.5	17	42.5	40	
Total	82	48.5	87	51.5	169*	

*Total number of stillbirths was 178, data were missing for 9

** The association was statistically not significant (χ^2 test= 3.833, DF=2)

Table 10: Stillbirths according to the mode of delivery and gender.

Mode of delivery	Males		Females		Total		P-value
	No.	%	No.	%	No.	%	
CS	42	48.3	45	51.7	87	51.5	0.95*
NVD	40	48.8	42	51.2	82	48.5	
Total	82	48.5	87	51.5	169	100	

*The association was statistically not significant (χ^2 test= 0.004, DF=1)

DISCUSSION

The study conducted at AL-Yarmouk Teaching Hospital in 2019 highlighted a significant public health issue with perinatal deaths in Iraq, presenting a higher mortality rate compared to neighboring countries such as Jordan and Iran. The perinatal mortality rate was reported at 47.5/1000 total births, with the neonatal death rate at 36.5/1000 live births and the early neonatal death rate at 33.1/1000 live births. These figures notably exceed those reported in Jordan (14.9/1000 live births)^[17] and Iran (10/1000 births during 2015)^[18], suggesting the impact of Iraq's challenging political and economic conditions on maternal and child health services. The study also revealed a male predominance in neonatal deaths, consistent with findings from other regions, such as Cuiabá/Brazil, where 61.0% of perinatal deaths were males^[19], and urban Pakistan, reporting 46.8% of perinatal deaths as males.^[20] This suggests a broader trend of higher vulnerability among male neonates. A critical factor identified in the study is gestational age, with 71.9% of the deceased neonates delivered between 28-36 weeks. This aligns with similar findings in studies from Bangladesh^[21] and Brazil^[19], highlighting premature neonates' increased risk of mortality. Additionally, low birth weight (<2500 grams) was prevalent in 69.8% of the deceased neonates, underscoring the established correlation between low birth weight and elevated neonatal mortality risks.^[22,23]

The analysis of early neonatal deaths revealed that 90.7% occurred within this study, paralleling other studies but indicating a higher percentage than observed in Bangladesh^[21] and Brazil.^[19] The study found no significant association between perinatal mortality and mode of delivery, a conclusion supported by research from Al-Ramadi Maternity and Children's Hospital in Iraq^[22], suggesting that factors beyond the mode of delivery contribute to mortality rates. Respiratory Distress Syndrome (RDS) emerged as the leading cause of neonatal deaths, a finding echoed in studies from Basrah Central Hospitals^[23] and Mobini Hospital of Sabzevar/Iran^[24], indicating the critical need for targeted interventions to address this condition. The burden of stillbirth was also a focal point, with a rate of 14.9/1000 total births, notably higher than rates reported in Jordan^[25] and Iran^[26], reflecting the adverse effects of Iraq's socio-political instability on prenatal and intrapartum care quality. The study's stillbirth analysis, limited by data registration issues, emphasized the gestational period's role, with a significant number of stillbirths occurring prematurely between 28-36 weeks of gestation, aligning with global trends that correlate increased stillbirth rates with decreasing gestational age.^[25,26] This study underscores the profound impact of Iraq's ongoing challenges on its healthcare system, particularly in maternal and neonatal care, highlighting the urgent need for comprehensive health system

reforms. Addressing the root causes of high perinatal and neonatal mortality rates requires not only improvements in healthcare delivery and accessibility but also broader socio-political stability and economic development.

CONCLUSION

Perinatal mortality rate at AL-Yarmouk Teaching Hospital was 47.5/1000 births, including 36.5/1000 live births, 33.1/1000 live births for early neonatal death, and 14.9/1000 total births for stillbirth. Major causes of perinatal fatalities were RDS, extreme prematurity, numerous congenital abnormalities, birth asphyxia, and sepsis. Low birth weight substantially predicted mortality. Causes of death were not significantly associated with gender, method of delivery, gestational age, or mother age.

REFERENCES

1. WHO | Neonatal and perinatal mortality 2000 [Internet]. Organization, World Health World Health Organization, Department of Making Pregnancy Safer. 2006 [cited 2020 May 25]. p. 1–76. Available from: <https://www.who.int/reproductivehealth/publications/monitoring/9789241563208/en/>
2. Ministry of Health -Iraq; Annual Statistical report, Vital events, Page 31. 2018, Ministry of Health Publication.
3. Moazzem Hossain SM, El Nakib S, Ibrahim S, Al-Harun A, Muhammad S, et al. (2018) Maternal and Neonatal Health in Select Districts of Iraq: Findings from a Recent Household Survey. *J Preg Child Health*, 5: 395. doi:10.4172/2376-127X.1000395.
4. Manjavidze T, Rylander C, Skjeldestad FE, Kazakhashvili N, Anda EE. Incidence and Causes of Perinatal Mortality in Georgia. *J Epidemiol Glob Health* [Internet], 2019; 9: 163–8. Available from: <https://www.atlantispress.com/journals/jegh>
5. Bell R, Glinianaia S V, Rankin J, Wright C, Pearce MS, Parker L. Changing patterns of perinatal death, 1982–2000: a retrospective cohort study. *Arch Dis Child Fetal Neonatal Ed* [Internet], 2004; 531–Available from: www.archdischild.com
6. Roos N, Tall F. Review of and Classification of Causes of Perinatal Death (ICD-PM). WHO [Internet], 2019; 1–15. Available from: <https://www.healthynewbornnetwork.org/hnn-content/uploads/Review-of-and-classification-of-causes-of-perinatal-death.pdf>
7. Getiye Y, Fantahun M. Factors associated with perinatal mortality among public health deliveries in Addis Ababa, Ethiopia, an unmatched case control study. *BMC Pregnancy Childbirth*, 2017; 1–7.
8. Hossain B, Mistry SK, Khan HR. Trends and determinants of perinatal mortality in Bangladesh. *PLoS One*, 2019; 1–19.
9. Kültürsay N, Aşkar N, Terek D, Yeniel AÖ, Altun Koroğlu Ö, Yalaz M, et al. The change of perinatal mortality over three decades in a reference centre in the aegean region: Neonatal mortality has decreased but foetal mortality remains unchanged. *Balkan Med J*, 2017; 34(6): 553–8.
10. The UN Inter-agency Group for Child Mortality Estimation: Levels & Trends in Child Mortality: Report 2014. New York: UNICEF, 2014.
11. Berhan Y, Berhan A. Perinatal mortality trends in Ethiopia. *Ethiop J Health Sci*, 2014; 24: 29–40.
12. Yirgu R, Molla M, Sibley L, Gebremariam A. Perinatal mortality magnitude, determinants and causes in west Gojam: population- based nested case-control study. *PLoS One*, 2016; 11: e0159390.
13. Plotkin M, Bishanga D, Kidanto H, Jennings MC, Ricca J, Mwanamsangu A, et al. Tracking facility-based perinatal deaths in Tanzania : Results from an indicator validation assessment. *PLoS One*, 2018.
14. Lawn JE, Blencowe H, Waiswa P, Amouzou A, Mathers C, Hogan D, et al. Stillbirths: rates, risk factors, and acceleration towards 2030. *Lancet* (London, England) [Internet]. 2016 Feb 6 [cited 2017 Aug 27]; 387(10018): 587–603.
15. Fall CHD, Sachdev HS, Osmond C, Restrepo-Mendez MC, Victora C, Martorell R, et al. Association between maternal age at childbirth and child and adult outcomes in the offspring: A prospective study in five low-income and middle-income countries (COHORTS collaboration). *Lancet Glob Heal* [Internet], 2015; 3(7): e366–77.
16. Gowen CW. Fetal and Neonatal Medicine. In: Marcdante KJ, Kliegman RM, editors. *Nelson Essentials of Pediatrics*. 7th ed. Canada: Elsevier Saunders, 2015; 197–8.
17. 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. 2016. *Matern Child Health J.*, 20(5): 1061-71. doi: 10.1007/s10995-015-18.
18. Daemi A, Ravaghi H, Jafari M. Risk factors of neonatal mortality in Iran: a systematic review. *Med J Islam Repub Iran*, 2019 (24 Aug); 33: 87. <https://doi.org/10.34171/mjiri.33.87>.
19. Gařva MAM, Bittencourt RM, Fujimori E. [Early and late neonatal death, characteristics of mothers and newborn]. *Rev Gaucha Enferm*, 2013; 34(4): 91–7.
20. 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. *Bull World Health Organ*, 2009; 87(2): 130–8.
21. Yasmin S, Osrin D, Paul E, Costello A. Neonatal mortality of low- birth-weight infants in Bangladesh. *Bull World Health Organ*, 2001; 79(7): 608–14.
22. Al-Ani ZR, Al-Hiali SJ, Al-Mashhadani WS. Perinatal mortality rate in Al-Ramadi Maternity and Children’s Hospital, western Iraq. *Saudi Med J.*, 2009; 30(10): 1296–300.
23. Al-Assadi AF, Al-Haroon DS, Al-Rubaye AH, Abdul-Rahman BA. Risk Factors and neonatal

- outcome among preterm birth at Basrah central hospitals. *Med J Basrah Univ*, 2018; 36(2): 88–96.
24. Ghorat F, Ghafarzadeh R, Esfehiani RJ. Perinatal mortality and its associated risk factors: A study in the north-east of Iran. *Iran J Neonatol*, 2016; 7(1): 47–51.
 25. Khader YS, Batieha A, Khander A and Hamadneh S. Stillbirths in Jordan: rate, causes, and preventability. 2020. *The Journal of Maternal –Fetal and Neonatal Medicine*, 33(8).
 26. Khalili N, Heidarzadeh M, Habibelahi A, Tayefi B, Ramezani M, Rampisheh Z, et al . Stillbirth in Iran and associated factors (2014- 2016): A population-based study. *Med J Islam Repub Iran*, 2020; 34(1): 266-275 URL: <http://mjiri.iums.ac.ir/article-1-6201-e>.