NEONATAL MORTALITY CAUSES IN CENTRAL TEACHING HOSPITAL OF CHILDRENIN BAGHDAD / IRAQ 2014-2017

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ABSTRACT

Background: Neonatal mortality is an index for newborn care and directly reflects maternal and child health care. Recently, publishings reported high neonatal mortality proportions in Baghdad and demonstrated the effect of conflicts on neonatal mortality. Therefore, this study was carried out to demonstred the causes of neonatal mortality in Central Teaching Hospital of Children. **Objectives:** To demonstrate the causes of neonatal mortality among neonates admitted in neonatal intensive care unit in Central Teaching Hospital of Children in Baghdad (2014-2017). **Subjects and Methods:** A cross-sectional analytic study was conducted. A review of case records of all dead neonates in neonatal intensive care unit for the period 2014-2017. **Results:** The dominant cause of death was prematurity complications (41.4%), infections (33.4%), birth defects (11.2%), birth asphyxia (9.2%) others like meconium aspiration, neonatal jaundice, renal failure, etc (4.8%). Most (80.4%) of prematurity complications were respiratory distress syndrome (RDS) and (19.6%) were other prematurity complications. Most (81.3%) of neonatal infections were sepsis. **Conclusion:** No changes in neonatal causes of death during the studied period. Prematurity complications with sepsis were the main causes of neonatal mortality.

KEYWORD: Therefore, this study was carried out to demonstred the causes of neonatal mortality in Central Teaching Hospital of Children.

INTRODUCTION

Neonatal mortality (NM) is an index for newborn care and directly reflects maternal and child health care.[1] It includes all infants dying during the period from birth to the first 28 days of life.[2]

NM is useful as an indicator of the standard of a country's educational, social and community health systems, the nutritional status of the population, and the national medical programs in obstetric and neonatal care. Also, it reflects the effectiveness of social measures in general and community health action in particular. Furthermore, it reflects the quality and availability of obstetric and neonatal healthcare services. Overall, it is a measure of socio-economic development of the country.[3]

This indicator enables policy makers, and public health officials to set interventions and programs targeted to a country's specific needs. Therefor governments, policy makers and societies need reliable figures on such important health indicator in order to ascertain deficiencies, improve on them by allocating sufficient funds and inform public health and clinical practices.[4]

In developed countries NM declined largely due to improvement in maternal and neonatal health care services as well as advances in diagnosis and treatment. Neonatal morbidity and mortality is still high in developing countries and is due mainly to negligence in women health, nutrition, deliveries by un-skilled personnel and poor antenatal care.[5]

NM is expressed in rate (neonatal mortality rate NMR), is the number of deaths during the first 28 completed days of life per 1000 live births in a given year or period.[4] Neonatal death classified to: early, which occur in the first week of life, andlate, that occur from[7- 28] completed days of life.[6]

The leading causes of fatality between neonateas all over the world, are prematurity (28%), severe infections (36%, including sepsis/pneumonia [26%], tetanus [7%], and diarrhoea [3%]), and complications of asphyxia (23%) account for most neonatal deaths. Of the remaining 14%, 7% of deaths were related to congenital abnormalities. LBW, which is related to maternal malnutrition, is a causative factor in 60-80% of all newborn deaths.[7]

SUBJECTS AND METHODS

Study Design
A cross-sectional study with analytic elements.

Study Setting
The study was conducted at central Teaching hospital of children. It is located at AL- Karkh side of Baghdad city .The neonatal intensive care unit (NICU) department in this hospital contains 47 incubators distributed in the general and private wards. It receives neonates who delivered outside the hospital. Since it is a tertiary hospital, its drainage comes from all of Baghdad city and mostly Al-karkh side of the city.

Time of the study
This study was carried out between 1st of January through 31th of December 2018.

2.4 Study population
The target population includes all cases records of neonatal death in Central Teaching Hospital of Children in Baghdad from 2014 to 2017.

2.5 Study Sampling
All cases records of neonates that admitted to NICU in the Central Teaching Hospital of Children in Baghdad for the period 2014-2017 and died during the period of first 28 days after birth. Data about neonatal admissions and neonatal death in neonatal intensive care unit in the hospital were obtained from department of statistics. Neonatal mortality proportions of admission were calculated. The neonatal medical records and deceased neonates files were reviewed. The hospital was visited two times a week for five hours per day from the 15th of March, 2018 to the 30th of May, 2018. The objectives of the study were explained to the manager of the hospital and health workers in department of statistics to ensure privacy of information according to ethical issues.and place of delivery.

Neonatal mortality causes

RESULTS
The causes of neonatal mortality were distributed as followings; prematurity complications (41.4%), infections (33.4%), birth defects (11.2%), birth asphyxia (9.2%) others like meconium aspiration, neonatal jaundice, renal failure, etc (4.8%). Most (80.4%) of prematurity complications were respiratory distress syndrome (RDS) and (19.6%) were other prematurity complications (extremely prematurity, intraventricular hemorrhage, hypothermia, etc). Most (81.3%) of neonatal infections were sepsis. All these findings were shown in Table 1 & figure 1.

Table 1: Causes of neonatal death.

Causes of neonatal death	No.	%
Prematurity complications	311	41.4
Infections	251	33.4
Birth asphyxia	70	9.2
Birth defects	84	11.2
Others	36	4.8
Total	752	100.0
Prematurity complications		
Respiratory distress syndrome	250	80.4
Other prematurity complications	61	19.6
Total	311	100.0
Infections		
Sepsis	204	81.3
Pneumonia	47	18.7
Total	251	100.0

Relationship between neonatal mortality causes and years of study
Regarding the causes of neonatal mortality; no significant variation of neonatal mortality causes was observed among years of study (p=0.2). All these findings were shown in Table 2.

Table 2: Distribution of neonatal mortality causes according to study years.

Variable	2014 No.	%	2015 No.	%	2016 No.	%	2017 No.	%	Total No. (%)	P
Causes of neonatal death Prematurity complications	78	25.1	60	19.3	94	30.2	79	25.4	311 (100.0)	0.2
Infections	57	22.7	73	29.1	72	28.7	49	19.5	251 (100.0)	
Birth asphyxia	17	24.3	9	12.9	25	35.7	19	27.1	70 (100.0)	

Birth defects	21	25.0	16	19.0	27	32.1	20	23.8	84 (100.0)	
Others	9	25.0	8	22.2	14	38.9	5	13.9	36 (100.0)	

DISCUSSION

Neonatal mortality is an indicator for education, social, nutritional status and medical programs in obstetric and neonatal care in any country. It is used to assess and evaluate the development of obstetric and neonatal health services in the community.[3]

In the line of that in other literatures, this study showed high neonatal mortality in the years of the study. This finding reflects the deterioration in health system. Several articles documented this deterioration in health system in Iraq which has been severely eroded by wars, widespread violence and civil war.[8]

The leading cause of newborn mortality was prematurity complications. It resulted in the deaths of 41.4% of neonates. Prematurity constituted 39.8% of the total neonatal mortality. Several articles documented the high prevalence of prematurity.[9] This result is in agreement to study conducted among Palestine Refugees in the Gaza Strip (39%).[10]

The most common cause of neonatal death related to prematurity complications in this study was respiratory distress syndrome (RDS) which constituted 80.4% of prematurity complications.

RDS represented 33.2% of total neonatal death. It is consistent with that reported in Fallujah (32%) during conflicts.[11] It is higher than reported in stable countries e.g. Saudi Arabia (27%).[12] Conflicts negatively affect the economical situations and health services. Unfortunately RDS constituted 25.8% of total mortality in term neonates. It is illogical finding. In a study conducted in Al- Kadhymia Teaching Hospital in Baghdad reported that RDS constituted only 1.90% of the total neonatal mortality in term neonates.[13] In another study conducted in Baghdad Teaching Hospital reported that incidence of RDS in term neonates constituted only (0.25%) of total live births.[14] Neonatal infections constituted (33.4%) of neonatal death. This finding is much higher than that reported in Baghdad Teaching Hospital, Iraq(11.1%).[15] This difference might be attributed to the difference in time for carrying out study. The reported was before ISIS conflicts. Deterioration of health system was several folds after ISIS.[16] The deterioration in health system affect the hospital environment that facilitate high rate of hospital-acquired infections due to overcrowding, difficulties in arranging visits, cleaning, sterile procedures, etc.[17] The observed figure (33.4%) is nearly similar to that reported in Southwest Ethiopia (34.4%), with fact that Ethiopia is a least developing country in Africa.[18]

This study revealed that neonatal sepsis is the most common type of fatal neonatal infection (81.3%). It represented (27.1%) from the total neonatal death. It is similar to that reported in Fallujah hospital (28.9%).[11] It is higher than that in Nasiriyah, southern Iraq (8.2%)[19] and less than that in South Sudan (49.7%).[20] This high figure of sepsis might be due to clinical approach in diagnosis rather than a confirmatory method.

Birth defect constituted 11.2% of dead newborns. This finding is in agreement with that reported in Al-Amara City (11.4%)[21] and Fallujah, west of Iraq (13.4%).[11] It is lower than that in Oman (29%)[22] but higher than that reported in Egypt (7.6%).[23] This difference might be attributed to variation between countries and socioeconomic status.

Birth asphyxia represented 9.2% of neonatal mortality in this study. This result is in agreement with that reported in Baghdad Teaching Hospital (9%)[15] and Al-Kadhymia Teaching Hospital (8.14%).[13] It is less than that reported in Al-Amara City (21.9%)[21] It is also less than that in northern Tanzania (45.7%).[24] It is more than the reported in Saudi Arabia (7.6%).[12] These differences might be due to socioeconomic differences.

There was no significant difference in neonatal causes of death among years of study (p=0.2). This finding reflects that there is no improvement in health service. Conflicts affect negatively preventive services of antenatal care which might improve the outcome.

CONCLUSIONS
1. The leading cause of neonatal mortality was prematurity and its complications (41.4%). Neonatal infections were the second cause of neonatal mortality (33.4%). The prevalence of common causes of neonatal mortality in this study is represented as birth defects (11.2%), birth asphyxia (9.2%) and other causes (4.8%).
2. There was no significant difference in neonatal causes of death among years ofstudy

Recommendations
1. Promotion of antenatal care services.
2. Increasing attention to newborns to identify those at high risk such as preterm infants and those with infection and applying strategies to reduce neonatal mortality.
3. To monitor the NM in hospitals periodically.

REFERENCES
1. Dettrick Z, Gouda HN, Hodge A, Jimenez-Soto E. Measuring Quality of Maternal and Newborn Care in Developing Countries Using Demographic and Health Surveys. PLoS One, 2016 Jun 30; 11(6): e0157110. doi: 10.1371/journal.pone.0157110.
2. Clarence W and Gowen Jr. Fetal ad Neonatal Medicine: Marcdante KJ, Kliegman RM in Nelson

Essentials of Pediatrics 7 th ed. Philadelphia, Elsevier Saunders, 2015; P. 187.

3. Yu YH. Victor Global, regional and national perinatal and neonatal mortality. J Perinal med, 2003; 31: 376-9. DOI: 10.1515/JPM.2003.057.

4. Rahman S, Eason J D, Haque K N, editors. Neonatal and perinatal mortality; global challenges, risk factors and interventions. Publisher: Nova Biomedical, 2017; 10-121. Availablefrom: https://novapublishers.com/shop/neonatal-and-perinatal-mortality- global- challenges-risk-factors-and-interventions/.Accessedat 1/9/2018.

5. Kousar T, Memon Y, Sheikh S, Memon S, Sehto R. Risk factors and causes of death in Neonates at neonatal unit of pediatric department in Liaquat University Hospital Hyderabad, Hyderabad, Pakistan. Rawal Medical Journal, 2010; 35(2): 205-208. Available from: https://www.scopemed.org/?mno=3800. Accessed at 5/9/2018.

6. WHO. Neonatal and perinatal mortality: country, regional and global estimates., World Health Organization 2006.

7. Lawn JE, Cousens S, Zupan J. Neonatal survival 1: 4 million neonatal deaths: when? where? why? neonatal survival series paper 1. Lancet, 2005; 365: 891_900. DOI: 10.1016/S0140-6736(05)71048-5.

8. AL-Ani ZR, AL-Hiali SJ. And AL-Farragi HH. Secular trend of infant mortalityrate during wars and sanctions in Western Iraq, Saudi Med J, 2011 Dec; 32(12): 1267-73. Availablefrom: https://www.researchgate.net/publication/51869287_Secular_trend_of_infant_mortality_rate_during_wars_and_sanctions_in_Western_Iraq. Accessedat 5/1/2019.

9. Abdul Latif BI, Al-Diwan JK, Al-Hadithi TS, Al-Hadi AH. Low birth weight and prematurity in the neonatal unit of a maternity and pediatrics hospital in Iraq. J Trop Pediatr, 2006; 52(2): 148–150. doi:10.1093/tropej/fmi098.

10. Van den Berg MM, Madi HH, Khader A, Hababeh M, Zeidan W, Wesley H, et al. Increasing Neonatal Mortality among Palestine Refugees in the Gaza Strip. PLoS One, 2015 Aug 4; 10(8): e0135092. Doi:10.1371/journal.pone.0135092.

11. Abdulghani S, Sirhan YT, Lawas AK. Perinatal and neonatal mortality in Fallujah General Hospital, Fallujah City, Anbar Province, west of Iraq. Health J, 2012; 4(9): 597600. DOI:10.4236/health.2012.49093.

12. Arafa MA, Alshehri MA. Predictors of neonatal mortality in the intensive care unitin Abha, Saudi Arabia. Saudi Med J, 2003 Dec; 24(12): 1374-6. Availablefrom: https://www.smj.org.sa/index.php/smj/article/view/4633. Accessed at 21/2/2019.

13. Al-Saady LA. Causes of neonatal deaths in AL-Kadhimiya Teaching Hospital. Iraqi Journal of Medical Sciences, 2007; 5(2): 44-8. Available from: https://www.iasj.net/iasj?func=fulltext&aId=28883.

Accessed at 22/2/2019.

14. Hameed N, Abed B. Descriptive Study of Neonatal Death in Neonatal Care Unit of Baghdad Teaching Hospital / Medical city / Baghdad (2007-2009). Fac Med Baghdad, 2012; 54(3): 214-7. Available from: https://iqjmc.net/wp- content/uploads/2016/10/214-217.pdf. Accessed at 25/2/2019.

15. Hameed N, Abed B. Descriptive Study of Neonatal Death in Neonatal Care Unit of Baghdad Teaching Hospital / Medical city / Baghdad (2007-2009). Fac Med Baghdad, 2012; 54(3): 214-7. Available from: https://iqjmc.net/wp- content/uploads/2016/10/214-217.pdf. Accessed at 25/2/2019.

16. Bash SS, AL-Kaseer EA. Neonatal mortality post ISIS conflict in Iraq. J Fac Med Baghdad, 2018 Dec 31; 60(3): 172-3. DOI:https://doi.org/10.32007/med.1936/jfacmedbagdad.v60i3.10.

17. Bash SS, Al-kaseer EA, Al-Diwan JK. Neonatal Mortality in Post- Conflict Baghdad, Iraq. International Journal of Science and Research, 2017; 79(57): 7-296. DOI: 10.21275/ART20183804.

18. Debelew GT, Afework MF, Yalew AW. Determinants and Causes of Neonatal Mortality in Jimma Zone, Southwest Ethiopia: A Multilevel Analysis of Prospective Follow Up Study. PLOS ONE, 2014; 9(9): e107184. doi: 10.1371/journal.pone.0107184.

19. Ahamadani FA, Louis H, Ugwi P, Hines R, Pomerleau M, Ahn R et al. Perinatal health care in a conflict-affected setting: evaluation of health-care services and newborn outcomes at a regional medical centre in Iraq. EMHJ-EasternMediterranean Health Journal, 2014.

20. Thomson J, Schaefer M, Caminoa B, Kahindi D, Hurtado N. Improved Neonatal Mortality at a District Hospital in Aweil, South Sudan. J Trop Pediatr, 2017 Jun 1; 63(3): 189-95. doi. 10.1093/tropej/fmw071.

21. Al-Sadi. EK. 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. Int J Pediatr, 2017; 5(3): 4601-11. DOI: 10.22038/ijp.2017.22315.1868.

22. Abdellatif M, Ahmed M, Bataclan MF, Khan AA, Al Battashi A, Al Maniri A. The Patterns and Causes of Neonatal Mortality at a Tertiary Hospital in Oman. Oman Med J, 2013 Nov; 28(6): 422–6. doi: 10.5001/omj.2013.119.

23. Mohamed EM, Soliman AM, El-Asheer OM. Predictors of mortality among neonates admitted to neonatal intensive care unit in pediatric Assiut University Hospital, Egypt. J Am Sci., 2011; 7(6): 606-11. Available from: https://pdfs.semanticscholar.org/da5a/ce4a12d33808c1f906e7ec3bed3 cd4462dcc.pdf. Accessed at 28/2/2019.

24. Mmbaga BT, Lie RT, Olomi R, Mahande MJ, Kvåle G, Daltveit AK. Cause- specific neonatal mortality

in a neonatal care unit in Northern Tanzania: a registry based cohort study. BMC pediatrics, 2012 Dec; 12(1): 116. doi.10.1186/1471-2431- 12-116.