Incidence and Risk Factors of Neonatal Mortality at Alramadi Teaching Hospital for Maternity and Childhood: A Cross Sectional Study

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Abstract

Objective: To estimate neonatal mortality rate and determine major risk factors that contribute to neonatal mortality at alramadi teaching hospital for maternity and childhood.

Method: A prospective cross sectional study including 3654 neonate admitted to neonatal care unit at alramadi teaching hospital for maternity and childhood. To investigate the prohibition of death neonatal we performed a logistic recession with an odds ratio estimation for the defrent of weight birth maternal education, cause of admission and place of delivery, as well as the estimate of additive and multiplicative interaction.

Results: Data reveals the The incidence of neonatal death was 9.2%. It was higher in those with birth weight below 1.5 kg this means that low birth weight have higher chance of death with OR and C.I of (3.7 & 2.18–6.07) respectively. Also mothers with low education levels have higher chance of loosing their newborn baby with OR and C.I of (2.56 & 1.06 – 4.29) respectively. Home delivery with midwife interference and sepsis also have strong association with neonatal death with OR (2.15 & 6.82) respectively.

Conclusion: This is the first study done at Neonatal care unit of alramadi teaching hospital for maternity and childhood which analyze risk factors that highly contribute to neonatal death at that hospital. Determination of risk factors of neonatal death will help medical staff to reduce it through managing the avoidable risks like sepsis and educating the society about the importance of hospital delivery.

Keywords: *Mortality, neonatal, death rate, sepsis, low birth weight, home delivery, Neonatal care unit (NCU).*

Introduction

The period neonatal (the first 28 days of life) considered so critical period in life possibly due to diseases threatening newborn's life and complexity process adaptive of the newly delivered[1-3]. Universally appear that 2.8 million deaths happened in newborns in 2013, consider the 44% of deaths in under-fives (4). There is clue proposition,a fast comparatively drop in the universal under-5 death-rate compared to the universal newborn mortality (yearly reduction rates 4.9% vs. 2.9%) among the year 2000 and 2013[4].

To prevent and adequately treat the utmost very important complications of birth preterm asphyxia birth and sepsis neonatal, which account collectively for three-quarter of deaths neonatal globally[4]. The former articles from urban Cameroon cited contagion, risks of premature delivery,congenital malformations and birth asphyxia as the large causes of the hospital

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neonatal mortality[5-7]. The styles of neonatal death-rate are valuable index of the fineness of obstetrical and care neonatal in a special check and the estimate include the rating of the fineness of health care[8-,11]. Infant death-rate and child death-rate are mostly considered as indicators sensitive of the status health not only of children, but all populations[12-14] .Very early death in newborns is any kind of newly delivered death-rate which happens during the initial 24 h following birth[15]. (WHO), in countries developing among 25 and 45% of neonates die within the initial 24 h after birth[16]. Studies from Ghanaappear that universal mortality in very early newborns was 16% per 1000 deliveries[17]. Very early neonatal risk factors for examplepremature,, low-birthweight, infections, hypothermia, asphyxia, meconium stained and birth injury raised the hazard of very early newborn death [18]. Newborn size is an important indicator of infant survival and childhood mortality. Accurate and Simple method of appreciate weight of newborn that can be readily exercised, to all pregnancies and consider method important of decreasing death-rate . Many researchers appear that depressed weight of the birth is linked with rise prenatal death-rate and morbidity[19]. At last years techniques ultrasound improve and utlizered in most obstetric and gynecology clinics in all the world[20]. The profile biophysical was utilized to estimate fetal well-being and to reveal gestational fetal age via measuring the diameter biparietal and crown rump length[21]. Other investigators need predicted intrauterine fetal weight utilizer measurement ultrasonogrephy of the fetal abdominal circumference[22]. most new studies have confirm the effectiveness of this measurement in normal monitoring growth fetal and in detecting growth intrauterine demise[23].

Patient and Method

A prospectivecross sectional study that involve a record of neonatal deaths that occurred from birth till 28 days of life was applied at Alramadi teaching hospital for maternity and childhood. This hospital located at west of Iraq. average acceptance annual neonatal is 3654 neonates. The neonatology divided unit in to two sections; inborn and outbornunits . The study in this hospital conducted because the is no annual reports for deaths neonatal at that hospital.Data were collected to attain and review data from January,2019 to December, 2019. All newborns delivered and died within the initial 28 days following delivery from January, 2019 to December, 2019 were involved in our focus . Even referred neonates that were transferred from other health care centers to Alramadi Hospital were included. Newborns whose parents or caregivers refused the consent were excluded. All maternal and neonatal characteristics was registered and data sheet extraction. The questionnaire was designed via the researchers to write down the characteristics demographic of mothers and newborns .

- Neonatal characteristics: Gestational age (calculated from last menstrual period), birth weight, gender, presenting complaint findings on the examination physical (rate heart,rate respiratory, signs of distress respiratory, neurological examination, abnormal breath sounds, any congenital anomaly, cardiac murmurs, temperature, abdominal distension,) all were recorded .
- Maternal characteristics: age of the mother, educational level, residence and occupation.

Infections in the Neonatal was diagnosed established on the presence of clinical signs of contagion (coma, fever, unable to feed, jaundice, vomiting, hypotonia, distended belly, consciousness altered, seizure) and any of the other next criteria biological : Elevated white blood cell count >25,000/mm3, Dropping white blood cell count <5000/mm3, thrombocytes <100,000/ mm3, C-reactive proteins >20 mg/l[24] with documented positive blood culture of the causative microorganisms. Prematurity ware acquaint established on WHO case qualifier of an age gestation less than 37 before weeks achieved (25). (HIE) ware established diagnosed on the Modified Sarnat-Sarnat Score[26] and an Apgar score ≤ 3 at the 5th minute of life linked with central nervous system involvement signs: flaccidity,convulsions or coma[27]. PH analysis was not available at that time and so not included in diagnosis of HIE. The neonatal hospital death-rate rate ware acquaint as the number of deaths happening between admissible neonates through a known expressed time as a percentage [28] .

Results

All results explaining in tables 1,2,3 and Figure 1, 2. The total number of NICU admission was 3654.

Table 1: Distribution of study patients by general characteristics of baby

Variable	No. (n= 3654)	Percentage (%)
Age (Days)		
< 3	2133	58.4
3 - 7	1051	28.8
> 7	470	12.8
Gender		
Male	1655	45.3
Female	1999	54.7
Birthweight (gm)		
< 1500	177	4.8
1500 - 2499	1109	30.4
2500 - 4000	2121	58.0
> 4000	247	6.8
GA at delivery		
Term	1678	45.9
Preterm	1976	54.1

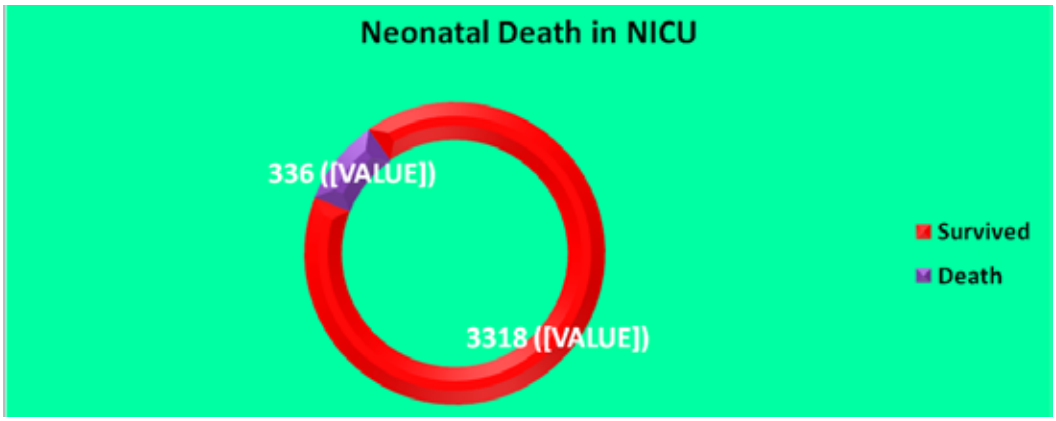

Figure 1: Incidence of neonatal death in NICU

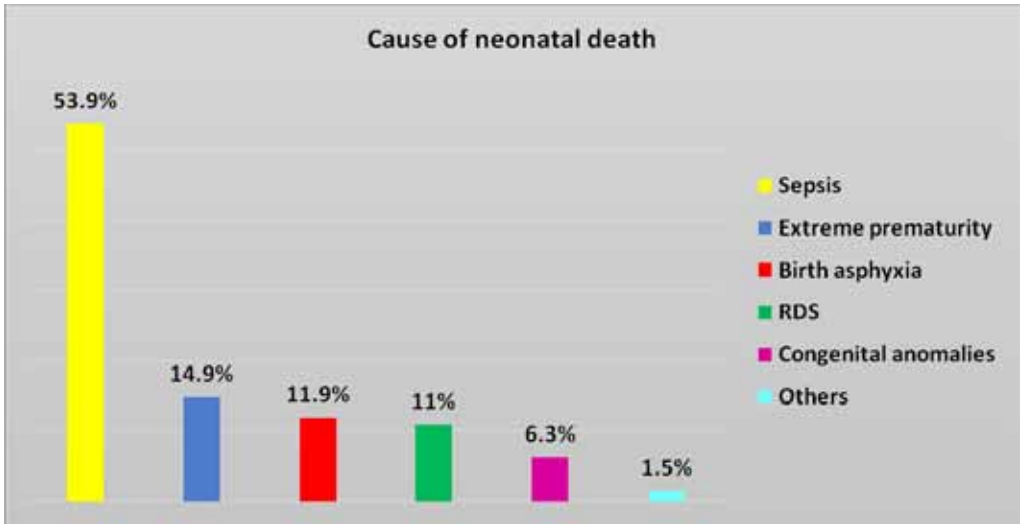

Figure 2: Cause of neonatal death in NICU

Table 2: Association between NICU outcome andgeneral characteristics of baby

Variable	NICU Outcome		Total (%) n= 3654	P - Value
	Died (%) n= 336	Survived (%) n= 3318		
Age at admission (Days)				
< 3	138 (6.5)	1995 (93.5)	2133 (58.4)	0.001
3 - 7	133 (12.7)	918 (87.3)	1051 (28.8)	
> 7	65 (13.8)	405 (86.2)	470 (12.8)	
Gender				
Male	209 (12.6)	1446 (87.4)	1655 (45.3)	0.001
Female	127 (6.4)	1872 (93.6)	1999 (54.7)	
Birthweight (gm)				
< 1500	66 (37.3)	111 (62.7)	177 (4.8)	0.001
1500 - 2499	119 (10.7)	990 (89.3)	1109 (30.4)	
2500 - 4000	145 (6.8)	1976 (93.2)	2121 (58.0)	
> 4000	6 (2.4)	241 (97.6)	247 (6.8)	
GA at delivery				
Term	147 (8.8)	1531 (91.2)	1678 (45.9)	0.401
Preterm	189 (9.6)	1787 (90.4)	1976 (54.1)	

Table 3: Logistic regression analysis for association of various risk factors with incidence of neonatal death in NICU

Variables	Odd's ratio	95% C.I for odd's ratio	P - Value
Birthweight (gm)			
< 1500	3.7	2.18 – 6.07	0.008
Reference (2500 – 4000)			
Mother education			
Illiterate or primary school	2.56	1.06 – 4.29	0.024
Reference (Higher education)			
Place of delivery			
Home	2.15	1.18 – 6.45	0.001
Cause of admission			
Sepsis	6.82	2.81 – 10.11	0.001

Discussion

This review which secured a number for 3654 babies, admitted to neonatal care unit at alramadi teaching hospital for maternity and childhood.

The incidence of neonatal death in this study was 9.2% and this result disagree with Farah E. Abdifatah[29] who found a neonatal mortality rate of 5.7% in a study done in Ethiopia, our higher incidence of death may be related to the poor hospitalization care and declining facilities especially after immigration and isis invasion .

In our study we found that neonates weighting below 1500 gm was a significant risk factor for neonatal mortality p value was 0.008, odd's ratio was 3.7 and this is similar to Lansky S, De Lima-Friche A, Silva A, et al and Juan C. Lona Reyes, M.D et al[30,31] who found that extreme low birth weight is a significant cause for neonatal death.

In the current study the neonatal mortality rate was significantly related to the maternal education (the illitrated mother or the mother who completed the primary school only)p value 0.024 odd's ratio (2.56) and this is similar to Sandra Costa Fonseca[32] who found that The neonatal death-rate in the term was 8.09‰ and the higher in newborns of mothers with low levels education .

Despite home deliveries were in asmall percentages in our study but the neonatal death were significant in home deliveries p value 0.001 odd's ratio 2.15 and this is similar to Justice Ajaari, MSc (Med)1,2 et al[33] and this reflected by Childbirth in ainstitution health presented via a trained medical crew minify maternal and neonatal death-rate and morbidity compared to births in the home.

Regarding the most common cause of admission to the NCU associated with higher mortality rate, in our study sepsis was the commonest cause of neonatal mortality p value 0.001 with odd's ratio 6.82. This is not similar to M Hoque, S Haaq, R Islam who found that prematurity was the commonest cause of mortality in admitted neonates despite the higher percentage of admission due to sepsis.[34] This can be explained bylow maternal education levels so they do not stuck to the optimal sterilization ways in handling their newborns, so medical staff fails to contain the spread of infection. In addition to the old fasionequipement and broken incubators which donot provide optimal environment to the newborns and lastly the total admission to neonatal care units exceeding its capacity due to large number of daily deliveries in that governorate, so overcrowded units is a major contributory for the spread of infection.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: Non

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