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Perinatal and neonatal mortality in Fallujah General Hospital, Fallujah City, Anbar Province, west of Iraq

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ABSTRACT

Objective: Perinatal and neonatal mortality reflects the quality of health services provided at any obstetrical/neonatal center. After eight years of being occupied, what became of the quality of the services we provide? Methods: A cross sectional study of 290 neonatal deaths at the neonatal intensive care unit (NICU) of Fallujah General Hospital during the period from the 1st of january to the 31st of December of the year 2010, utilizing multiple obstetrical and neonatal variables: Results: The results showed that although there was a high PMR & NMR during the last decade, being 50.3/1000 live births & 41.5/1000 live births respectively in the year 2010 at the same hospital, and in comparison to most of Arab & Eastern Meditaranean countries our PMR and NMR are much higher. Conclusion: It is concluded that we have very high death rates, which necessitates providing better care at obstetrical/neonatal centers, plus establishing a collaborative network of neonatologists for evaluating and improving neonatal care.

Keywords: PMR; NMR; NICU

1. INTRODUCTION

As PMR and NMR designates fetal and neonatal deaths influenced by prenatal conditions and circumstances surrounding delivery [1], thus studying these mortality rates as well as the impact of several variables [2] on death rates of newborns admitted to the NICU was essential in assessing the quality of care provided and the effectiveness of the interaction between obstetricians and neonatologists in anticipating prenatal problems and taking prompt preventive therapeutic measures [3,4], realizing the impact of the occupation and its major role in limiting the services we provided by denying us new technologies and therapeutic, let a lone the availability of spare parts for the equipment already present, as well as inflicting a low socioeconomic status which is frequently associated with premature deliveries that is correlated with high rates of morbidity and mortality [5].

2. PATIENTS AND METHODS

A cross sectional study of 290 neonatal deaths which occurred during the period from the 1st of January to the 31st of December of the year 2010, plus the 64 still births registered during the same year at Al-Fallujah General Hospital.

The variables selected were neonatal and obstetrical according to the criteria shown below.

A—neonatal variable: (**Table 1**)

1) birth weight: (<1500 grams, 1500 - 2499 grams, >2500 grams, >4000 grams).

2) gestational age: (<33 weeks, 33 - 36 weeks, >37 weeks) .

3) apgar score: (<3 at five minutes, <7 at five minutes, >7 at five minutes).

4) time of death: (<24 hours, 24 - 72 hours, >72 hours).

5) sex = male versus females.

6) cause of death; six principle causes of death were noted.

B—obstetrical variables: (**Table 2**)

1) maternal age (<20 years, 20 - 35 years, >35 years) taking into account the extremes of reproductive age.

2) mode of delivery: vaginal versus cesarean section.

3. RESULTS

The perinatal mortality rate at Fallujah General Hospital during the year 2010 was 50.3/1000 of total birth, while neonatal mortality was 41.5/1000 of total live birth.

Obstetrical variable showed that 74.1% of neonatal death had mothers of age 20 - 35 years and 16.5% were >35 years and only 9.3% had mothers <20 of age.

In regard to mode of delivery 60% of neonatal deaths were delivered spontaneously versus 40% delivered by cesarean section.

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Table 1. Neonatal variable.

	variable		number	Percent of total deaths
1	Gestational age	<33 wk	140	48.2%
		33 wk - 36 wk	57	19.6%
		>37 wk	93	32%
2	Birth weight	<1500 gm	100	34.4%
		1500 - 2499 gm	155	39.6%
		>2500 gm	73	25.1%
		>4000 gm	2	0.68%
3	Apgar score	<3 at 5 min	30	10.3%
		<7 at 5 min	165	56.8%
		>7 at 5 min	95	32.7%
4	Time of death	<24 hr	68	23.4%
		24 - 72 hr	92	31.7%
		>72 hr	130	44.8%
5	Sex	Male	179	61.7%
		Female	111	38.2%

Table 2. Obstetrical variables.

	Variable		Number	Percent of total death
1	Age of mother	< 20 years	27	9.3%
		20 - 35 years	215	74.1%
		> 35 years	48	16.5%
2	Mode of delivery	Spontaneous delivery	174	60%
		Cesarean section	116	40%

Neonatal variables on other hand showed that 39.6% of neonates were of low birth weight *i.e.* <2500 grams, 34.4 were of very low birth weight < 1500 grams and 25.1% were of normal birth weight and 0.68% were > 4000 grams.

Preterm newborns comprised 68% of the total neonatal deaths, 48.2% were <33 wk and 19.6% were 33 - 36 weeks, 32% > 37 weeks of gestational age.

23.4% of neonatal deaths occurred in the first 24 hours of life, 31.7% of neonatal deaths happened between 24 - 72 hours of life, and 44.8% occurred after 72 hours of life.

Apgar scores of <7 at 5 minutes comprised 56.8% of the newborns, 32.7% were >7 at five minutes and 10.3% had an apgar score of <3 at five minutes.

Males constituted 61.7% of all deaths versus 38.2% females, considers that (4068) males were born a live versus (2904) females.

Monthly variations in death rate is shown in **Table 3**. Cause-specific death rate is show in **Table 4**.

4. DISCUSSION

Fallujah General Hospital is one of the busiest hospital in AL-Anbar governorate.

It is known to be one of the best equipped and staffed general hospitals, serving a wide geographical rural and urban area. Thus death rates at it's NICU, although cannot represent the rates in AL-Anbar governorate and AL-Fallujah city nevertheless it can give us a fair idea of what is going on.

The decline in PMR and NMR which had been declared in European and American [5,6] literatures for the last decade, had been attributed primarily to the development of new technology and therapeutics such as new generation of ventilators, Ecmo, and pulmonary surfactant, thus providing a more aggressive respiratory and

Table 3. Monthly variations in death rate.

Month	number	Percent of total death
January	26	8.9%
February	20	6.8%
March	18	6.2%
April	20	6.8%
May	26	8.9%
June	20	6.8%
July	30	10.3%
August	22	7.5%
September	18	6.2%
October	28	9.6%
November	30	10.3%
December	32	11%
TOTAL	290	100%

Table 4. Distribution of cause-specific death rate.

Cause of death	Number	Percent of total death
Congenital anomalies	39	13.4%
RDS	93	32%
Sepsis	84	28.9%
Asphyxia	61	21%
IC hemorrhage	10	3.4%
Other	3	1%
TOTAL	290	100%

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cardiovascular support at intensive care settings [7,8], while improvement in some developing countries had been attributed further to the improvement in socioeconomic and educational status [9].

NMR in NICU in Fallujah general hospital during the years 2007 to 2009 was about 57.3/1000 live births according to the hospital statistics compared to that found in this study 41.5/1000 live births, yet it is still high compared to 23/1000 live births in Iraq, [2,8], & 24.9/1000 live births in Al-Yarmook hospital in Baghdad [1].

The NMR reflect the quality of social & health services & the economic status of each country, low rates found in Qater 4/1000 live births, UAE 5/1000 live births, Kuwait & Bahrain 6/1000 live births, Oman 7/1000 live births, Lebanon 8/1000 live births, Libya 9/1000 live births [10,11]. Moderate rates are found in Tunisia & Saudi Arabia 12/1000 live births, Jordan & Egypt 13/1000 live births, Iran 19/1000 live births [11,12].

Higher rates registered in Morroco 23/1000 live births, Yemen 32/1000 live births, Eastern Mediterranean region 35/1000 live births, Djibouti 36/1000 live births [12], Sudan 41/1000 live births, while highest rates were found in Afghanistan 50/1000 live births & Somalia 61/1000 live births [13].

The high PMR & NMR in this study reflects a higher percentage of very low birth weight newborns, & preterm infants, with the survival improving as gestation & birth weight increased, thus stressing the need to concentrate efforts in preventing premature & low birth weight deliveries.

Considering the major cause of death, respiratory insufficiency of prematurity remains the major cause of death ,similar to what was reported in Yarmook Hospital [1] & Dyala province, Iraq [9] & results reported by Dawou A, *et al.* at UAE [10], sepsis being the 2nd, birth asphyxia, & congenital anomalies being the 4th, because most of these anomalies are missed, as most of them being shifted to special centers in Baghdad for managements, others being managed at home because the family refuse admission to the NICU, others being aborted at earlier stages of pregnancy or delivered prematurely & died before being diagnosed especially in cases of congenital heart defects because many of these defects are not comptable with life.

Most of our deaths happened after 72 hours (44.8%), this result disagreed with what have been found in yarmook study [1], & that of UAE [11].

Males are the main victims which agreed with all of the above studies [1,10,11].

Obstetrical variable revealed a higher mortality rates among spontaneously delivered babies versus those delivered by cesarean section. Majority of mothers were 20 - 35 years of age, being at the peak of their reproductive life, which completely agreed with the results of **Alyarmook hospital study** [1].

5. CONCLUSIONS & RECOMMENDATIONS

There is no doubt that the years of sanction, followed by the hard years of occupation which had overshadowed our heath services for the last 2 decades must have had a bad impact. Thus to have the potential to save more of these infants lives & to reduce subsequent mortality & morbidity, there is a serious need to establish a clear plan to prevent preterm & low birth weight deliveries & to offer early fetal diagnosis of congenital malformations by providing better antenatal care services with a good interaction between obstetricians & paediatricians, & improving the educational & socioeconomic status of the community plus having a better family planning. Further more there is a need to establish a collaborative network of neonatologists to provide a sound organizational structure for evaluating & improving the effectiveness of neonatal care. There is also a serious need to provide NICUs with new technologies & therapeutics & amore professional training for doctors & nurses..

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ABBREVIATIONS AND ACRONYMS

PMR (Peri natal mortality rate)
NMR (Neonatal mortality rate)
NICU (Neonatal intensive care unit)

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