Assessment Of Factors Causing Mortality Rate Of Neonate In Al-Batool Teaching Hospital In Mosul City

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الخلاصة:
الهدف: الهدف من الدراسة هو تقييم اسباب وفيات الأطفال حديثي الولادة خلال عام واحد والداخلين إلى غرفة العناية المركزة لحديثي الولادة في مستشفى البتول التعليمي في مدينة الموصل.
المنهجية: جمعت عينة الدراسة من خلال مراجعة شاملة لسجلات وحدة العناية المركزة لحديثي الولادة في مستشفى البتول التعليمي في مدينة الموصل خلال عام واحد (كانون الثاني إلى كانون الأول) (2010). تم تسجيل (341) حالة وفاة لحديثي الولادة من بينها (180) ذكور و(161) إناث والتي تتراوح أعمارهم مابين (1 – 10) ايام الاولى. جمعت عينة الدراسة خلال الفترة من (1 / 12 / 2011) إلى (25 / 1 / 2012).
النتائج: ان عدد الأطفال الداخلين إلى وحدة العناية المركزة (23198) خلال عام واحد (2010)، 341 حالة وفاة. ثلاثة أسباب رئيسية تسببت في وفاة الأطفال حديثي الولادة والتي كانت أهمها متلازمة الضائقة التنفسية (42%)، الخدج ومشاكل التنفس بنسبة (20%)، أما التشوهات الخلقية فكانت بنسبة (15%). ثلاثة وتسعون بالمائة من وفاة حديثي الولادة وقعت مابين (1 – 10) أيام من فترة حياتهم. تزداد نسبة الوفاة مع تزايد في انخفاض وزن الطفل إضافة إلى فترة الحمل مابين (29 – 30 أسبوعا). كانت الأفضلية لمعدل الوفاة المبكرة والتي تم ملاحظتها في وزن الطفل الوليد الأقل من (2500 غم) وفترة الحمل الأقل من (35 أسبوع).
الأستنتاجات: أظهرت الدراسة ان اكثر من ربع الامهات (27%) بعمر (31 – 35) سنة، بينما (38%) من وفاة الاطفال حديثي الولادة ظهرت خلال الثلاثة الأيام من حياتهم. كان السائد من وفاة الاطفال عند الذكور بنسبة (53%) و (29%) منهم بوزن (500 – 999 غم). ثمانية وستون بالمئة من الاطفال كانت طريقة ولادتهم طبيعية واكثر الحالات (25%) ظهرت بعمر الحمل (29 – 30) اسبوعا. متلازمة الضائقة التنفسية كانت الاكثر شيوعا بنسبة (42%) يتبعها الخدج (19%)، التشوهات الخلقية (14%) و كذلك نقصان الوزن بنسبة (11%).
التوصيات: اوصت الدراسة الى ضرورة بذل جهود كبيرة لتحديد وتقليل عوامل الخطر المرتبطة بوفيات الأطفال الحديثي الولادة وعلى نحو كافي لتقييم الرعاية الطبية والتمريضية المقدمة في وحدات العناية المركزة لحديثي الولادة. ورعاية المراة الحامل بطفلها هو المفتاح للحصول على الرعاية الامنة للاطفال حديثي الولادة.
المفردات: اطفال حديثي الولادة، معدل الوفيات، وحدة العناية المركزة.

Abstract
Aim: The study aim to find out the neonatal mortality rate among the neonates admitted for a period year to the neonatal intensive care unit in Al-Batool Teaching Hospital in Mosul city.
Methodology: A retrospective study the sample collecting from review the register for neonate intensive care unit in AL-Batool Teaching Hospital through one year 2010 (January – December). It registry (341) deaths of neonate. Were (180) male, and (161) female with duration of stay in Neonate Intensive Care Unit between (1 - 3) days old. Data collected for period from (1/12/2011) to (25/1/2012).
Results: From the (23198) infant admitted to intensive care unit at Al-Batool Teaching Hospital in Mosul City within one year 2010 (January to December), 341 died. The 4 common causative illnesses were respiratory distress syndrome (42 %), prematurity (19%) and congenital abnormality (14%) and low birth weight (11%) . Ninety three percent of deaths of neonate occurred within the first three days of their life. The mortality rate increased with the low in birth weight, as well as gestational age between (29-30Wks). For early-neonatal mortality, odds were observed for birth weight less than 2,500 g or gestation less than 35 weeks.
Conclusion: This study concluded that over a quarter of mother age were (31-35) years old (twenty seven percent), while, the thirty eight percent of neonate were died within three days after born. The predominance of males for death (Fifty three percent) and (twenty nine percent) of them birth weight was (500 - 999 g). Sixty eight percent were delivered of normal vaginal delivery, with very high case fatality rate (Twenty five) those who were delivered (29^{th} - 30^{th}) weeks. Respiratory distress was the commonest primary diagnosis (Forty two percent) among all admitted neonates, followed by premature (Nineteen percent), congenital malformations (Fourteen percent), and low birth weight (Eleven percent).
Recommendation: This study recommended that a need for great efforts to determine and reduce risk factors associated with neonatal mortality, and to adequately evaluate the medical and nursing care provided in neonate intensive care units. A neonatal care for pregnant woman is the key for safe neonatal life.
Key Word: Neonate, Mortality rate, Intensive care unit.

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INTRODUCTION:

Neonatal period is the most hazardous period of life because of various problems / diseases which a neonate faces. There are a great overlap between the risks associated with morbidity and mortality in the perinatal and neonatal periods[1]. Neonatal death is a serious concern, both in the developing and developed worlds. While infant mortality rates have been decreasing steadily all over the world, changes in neonatal mortality have been much slower[2,3]. Accurate documentation of fetal and neonatal deaths enables analysis of change in perinatal death rates over time and assessment of their preventability. It is recommended that such audit should occur both regionally and nationally[4]. Neonatal period (0 to 28 days of life) is the most hazardous period of life because of various problems/diseases, which a neonate faces. A large majority of newborn babies do not develop any serious problem or difficulties and require only minimal care, which can be provided by the mother if properly supervised by a health worker. High risk mothers are likely to give birth to preterm or low birth weight babies who were suffer from a large number of problems[5]. However, majority of the causes of neonatal morbidity are preventable[6]. Some of the newborns in developing countries have an impaired growth right during their intrauterine life, reflecting the nutritional status of the mother[7]. About 42% of the infant deaths in our country occur within first 28 days of life[8]. Prematurity accounts for majority of high risk newborns as they face a large number of problems[9]. The study aim to assess of factors causing mortality rate of neonates admitted within one year to the neonatal intensive care unit in Al-Batool Teaching Hospital in Mosul city.

METHODOLOGY

A retrospective study was conducted to achieve the objectives of the present study for the period of (1/12/2011) until (25/1/2012). The subject of the study were consist of all neonate death find in intensive care unit during the period from January 2010 to December 2010 were included in the study. They amounted to 341 neonate. The study was carried out in the intensive care unit at Al – Batool Teaching Hospital, Mosul City. The tool of the study (questionnaire) which contain the followings information such as duration of stay in NICU (days), gender, gestational age (weeks), mother's age, birth weight, socioeconomic status, birth rank, type of delivery and final diagnosis of death. Mother's age was distribution in different group. Duration of stay in Newborn Intensive Care Unit were distributed according to their days (4 groups: (0 less than one day), (1-3 days), (4 - 7 days), (8-30 days), gender of newborn (male or female), gestational age (6 groups on the basis of the date of the last menstruation or data obtained through the ultrasound: (25-26) weeks, (27-28) weeks, (29-30) weeks, (31-32) weeks, (33-34) weeks, (35-36) weeks), birth weight were distribution different group, in addition, final diagnosis (premature, respiratory disease syndrome, birth weight, congenital abnormalities, pneumonia, pnemothorax, and infection about alba tool system in writing, reservation of files, physician and nurses roles in documentation.

RESULT:

Table (1): Distribution of demographic characteristic.

Item		No.	%
Mother age (years) X = 25 years SD = 6.44	15 – 20	41	12%
	21 – 25	72	21%
	26 – 30	87	26%
	31 – 35	92	27%
	< 36	49	14%
Socioeconomic Status of family	Poor	188	55%
	Satisfactory	92	27%
	Good	61	18%
Delivery type	Normal vaginal delivery	232	68%
	Cesarean section	109	32%
Birth rank	Less than 3	116	34%
	More than 3	225	66%
Gestational age (weeks) X = 30.5 (week) SD = 3.60	25 – 26	21	6%
	27 – 28	43	12%
	29 – 30	84	25%
	31 – 32	61	18%
	33 – 34	75	22%
	35 – 36	57	17%

This table Shows that from the (23198) infant admitted to intensive care unit at Al-Batool Teaching Hospital in Mosul City within one year 2010 (January to December), 341 died of them, and over a quarter (27%) of mother ages were between (31-35) years, (26%) were (26-30) years old and (21%) were (21-25) years old. The average age was (25) years (SD 6.44). Fifty five percentage had poor of socioeconomic status. Most delivery type in normal vaginal delivery (68%), while (66%) of birth rank occurred more have (3) delivered. Twenty five percentage of gestational age occurred between (29 – 30) weeks. The average of gestational age was (30.5) weeks (SD 3.60).

Table (2): Distribution of neonates admitted to neonate intensive care unit by gender, birth weight, duration of stay and the causes of death.

Item		No.	%
Gender of neonate The ratio male / female (1.11:1)	Male	180	53%
	Female	161	47%
Birth weight (g) X = 1.750 g SD = 935.41	500 – 999 g	98	29%
	1,000 – 1,499 g	72	21%
	1,500 – 1,999 g	83	24%
	2,000 – 2,499 g	38	11%
	2,500 g and above	50	15%
Duration of stay in neonate intensive care unit X = 15.5 SD = 8.80	0 (less than a day)	59	17,4%
	1 – 3	131	38,4%
	4 – 7	79	23.1%
	8 – 10	72	21,1%
Causes of death neonate	Respiratory distress syndrome	144	42%
	Premature	65	19%
	Congenital abnormalities	47	14%
	Low birth weight	37	11%
	Pneumonia	22	7%
	Pneumothorax	15	4%
	Infection	11	3%

This table Shows the predominance of males for death (53%), the male to female ratio was (1.11:1). The mortality rate decreased with the increase in birth weight as well as gestational age. None of the neonates below (27) weeks gestational age survived, and (29%) of those weighting less than 1000g died, (38%) of the deaths occurred within the first three days of admission. Average duration of neonate intensive care unit stay was (15.5) days (SD 8.80 days) and the minimum and maximum stays were recorded as (0 and 30) days, respectively. Common causes of mortality in LBW neonates (< 2.500 g) were respiratory distress and prematurity, and both of them decreased as the birth weight increased. Among common causes of mortality were respiratory distress (42%), prematurity (19%), congenital

malformations (14%), pneumonia (7%), Pneumothorax (4%) and infection (3%), respectively.

DISCUSSION:

The result shows that (341) neonatal deaths among (23198) births registered in the 12 month period in the intensive care unit at Al – Batool Teaching Hospital, Mosul city. The predominance of males for death (53%) in our study raises the issues of biological vulnerability of male neonates as it is found universally in other studies[10-11]. Our findings did not show significant effect of mother's age and gender of neonate on neonatal death. In the present study; gender of neonate was not a risk factor, as similar as the study conducted in Kurdistan Province [12], But delivery route (Cesarean section), which the mentioned study failed to show significant association with neonatal mortality, was a predictor of outcome in our study[12]. Almost half of all deaths in this hospital occurred among the very low birth weight babies (<1,500 g). These findings are similar to other studies in South Africa, Africa and other low resource countries[13,14,15]. All these studies identified that malnutrition, lack of nutritional education and lack of early antenatal care are significant risk factors for low birth weight babies. A study from India reported that the perinatal mortality rate was (79.0 per 1,000). The highest perinatal death rates were for preterm and low birth weight babies, and they also showed that poor maternal nutritional status, absence of antenatal care, and complications during labour were independently associated with substantially increased risks of neonatal death. Shirvani et al. (2002) survey which was performed more than one decade earlier, showed prematurity, LBW, maternal age older than 35 yr and birth rank higher than 5 as neonatal death risk factors[16]. Many published studies have evidenced that low birth weight with or without prematurity plays a role in a complex framework of causality involving genetic and environmental factors related to socioeconomic and mother health status[17]. A national study of perinatal / neonatal mortality confirmed the suspicion that Egypt has transitioned in to a different epidemiological model where immediate complications of delivery and prematurity have become more significant contributors to neonatal mortality than infection. The study documented that prematurity and respiratory distress contributed to 57% of deaths while infection represented only 7% of neonatal deaths[18]. This was in agreement with our study. We found that congenital anomalies caused (14%) of neonatal deaths in accordance with the national study, but in contrast to others in developed countries. Wong et al. (2008) found that congenital malformations (29.6%) represented the commonest cause of neonatal deaths despite of thorough antenatal and early termination of pregnancy in presence of major congenital malformations[19]. On the other hand respiratory distress caused only (9.6%) of neonatal mortality. The same was reported by Sankaran et al[16]. These differences in pattern of neonatal mortality may be due to marked advances in the developed countries concerning neonatal mechanical ventilation and management of preterm neonates together with dealing properly with neurological sequels of hypoxia and routine use of surfactant in respiratory distress syndrome. All these factors caused regression of respiratory distress and prematurity as main contributors to neonatal deaths. A number of antenatal and intrapartum factors have been reported in the literature to be significantly associated with perinatal and neonatal deaths. In the present study, only maternal risk factors found to be significantly associated with mortality of neonates were multiple births and vaginal delivery. Maternal factors found to be significantly associated with neonatal mortality were history of abortion,

bleeding per vagina and failure to give steroids antenatally at least 24 hours prior to childbirth[17,20]. Forssas et al. (1999) found that among maternal predictors of perinatal mortality are: in-vitro fertilization, previous stillbirth, higher maternal age, maternal diabetes, lower socioeconomic status, smoking during pregnancy, and first birth. They also concluded that excess mortality due to maternal risk factors occurred mainly through their tendency to cause LBW. However, the excess mortality associated with low socioeconomic status and diabetes was mediated by other mechanisms in addition to LBW[21]. Our study showed that the risk factors most closely associated with neonatal mortality in Neonate Intensive Care Unit were respiratory distress (42%), prematurity (19%), low birth weight (11%), multiple births more than 3 (66%) and vaginal delivery (68%). Locatelli et al. (2005) showed that smaller gestational age and birth weight, female gender, low five-minute Apgar score and failure of steroid administration were independent predictors of survival[22]. Chen et al. (2005) found that, with multiple logistic regression analysis, only low birth weight and intraventricular hemorrhage grades were the significant predictors of unfavorable outcomes [23]. Brito et al. (2003) showed that very low birth weight infants with birth weight less than (750g, less than 29 weeks) gestational age and CRIB (Clinical Risk Index For Babies) scores above ten had higher mortality rate[24].

CONCLUSION:

This study concluded that over a quarter of mother age were (31-35) years old (twenty seven percent), while, the thirty eight percent of neonate were died within three days after born. The predominance of males for death (Fifty three percent) and (twenty nine percent) of them birth weight was (500 - 999 g). Sixty eight percentage were delivered of normal vaginal delivery, with very high case fatality rate (Twenty five) those who were delivered (29^{th} - 30^{th}) weeks. Respiratory distress was the commonest primary diagnosis (Forty two percent) among all admitted neonates, followed by premature (Nineteen percent), congenital malformations (Fourteen percent), and low birth weight (Eleven percent).

RECOMMENDATION:

This study recommended that a need for great efforts to determine and reduce risk factors associated with neonatal mortality, and to adequately evaluate the medical and nursing care provided in neonate intensive care units. A neonatal care for pregnant woman is the key for safe neonatal life.

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