

Disease Patterns and outcomes of Neonatal Admissions at Raparin

Pediatric Teaching Hospital in Erbil City

انماط المرض ومخرجاته لحديثي الولادة الراقدين في مستشفى رابرين التعليمي للأطفال في مدينة اربيل

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المستخلص:

الهدف: تهدف الدراسة إلى تحديد انماط المرض ونتائج الرقود بين حديثي الولادة المرقدين في وحدة العناية بالاطفال حديثي الولادة في اربيل . واستخدام النتائج كاساس لتقييم نسبة المراضة والوفيات لحديثي الولادة .

المنهجية: دراسة استرجاعية اجريت في وحدة العناية بالاطفال حديثي الولادة في مستشفى رابرين التعليمي للأطفال في اربيل . تم بناء اداة لجمع البيانات من قبل الباحث تضمن (العمر، الجنس، سبب الترقيد في المستشفى، التشخيص، النتيجة النهائية للعلاج وسبب الوفاة)، تم تحديد صلاحية محتوى الإستبانة من خلال فريق الخبراء وتم تحديد الاتساق الداخلي للأداة من خلال الدراسة التجريبية . وقد تم جمع البيانات من خلال مراجعة الملفات الطبية لجميع الرضع الراقدين في وحدة العناية بالاطفال حديثي الولادة خلال 2013. وقد تم تحليل البيانات من خلال تطبيق النهج الإحصائي الوصفي والاستدلالي باستخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS) النسخة 19.

النتائج: خلال الفترة من 1 شباط لغاية 31 كانون الاول لعام 2013 بلغت مجموع عدد حديثي الولادة المرقدين في مستشفى رابرين التعليمي للأطفال 3880 حديث الولادة . اعلى نسبة منهم 58% ذكور، معظم حديثي الولادة ادخلوا للمستشفى خلال الاسبوع الاول من العمر . واليرقان هو السبب الرئيسي 54.1% لرقودهم في المستشفى، وكانت نسبة وفيات حديثي الولادة 5.4% من العينة وكان الابتسار السبب الرئيسي 35.6% للوفاة تلتها الالتهابات 25.5%، التشوهات الولادية 18.8% والاضطرابات التنفسية 10.1% كما ان معظم 87.9% حديثي الولادة اخرجوا من المستشفى من غير ان يبين حالتهم الصحية عند الاخراج. كشفت الدراسة عن وجود علاقة معنوية عالية بين امراض حديثي الولادة واعمارهم.

التوصيات: اوصت الدراسة بتحسين مهارات التسجيل الاحصائي للفريق لصحي، واجراء المزيد من البحوث حول العناية بحديثي الولادة في وحدة العناية بحديثي الولادة لهستشفى رابرين التعليمي للأطفال في اربيل.

Abstract

Objectives: This study aims to determine the disease's patterns and outcomes of admission among neonates hospitalized at the neonatal care unit in Erbil City, and using the findings as a baseline for neonate's morbidity and mortality assessment in the future.

Methodology: A retrospective study carried out at neonatal care unit of Raparin pediatric teaching hospital. An instrument for data collection developed by researcher included (age, gender, cause of admission, diagnosis and outcome upon discharge and causes of death). Content validity of the instrument was determined through the use of panel experts and reliability of the instrument was determined through a pilot study. The data were obtained by review the medical records of all newborns admitted to neonatal care unit during 2013. Data were analyzed through the application of descriptive and inferential statistical approaches by using Statistical Package for Social Science (SPSS) version 19.

Results: During 1st January to 31st December of 2013 the total number of neonates admitted to Raparin pediatric teaching hospital was 3880. Highest percentages (58%) of neonates were male and majorities (76.26%) were admitted during the first week of life. Jaundice was the main cause 54.1% of neonates admission. The neonate deaths rate was 5.4% of the sample, and the first cause of death was for prematurity 35.6%, then infections 25.5%, congenital anomalies 18.8% and Respiratory dysfunction 10.1%. Majority 87.9% of neonates were discharged with unspecified discharge outcome. And the study found high significant association between neonate's diseases and neonate's age.

Recommendations: The study recommended improving statistical recording skills for health care team and conducting further studies regarding neonatal care at neonatal care unit of Raparin pediatric teaching hospital.

Keywords: Disease pattern, outcome, neonatal admission.

Introduction

Among the life span of the infancy period neonatal period is very critical, which to large extent determines the overall health status of the infant and in turn adult life. Neonatal morbidity and mortality rates reflect a nation's socioeconomic status, as well as the efficiency and effectiveness of healthcare services⁽¹⁾. Infant mortality rate is an indicator of how healthy the nation is, this rate is used to compare national health care to previous years and to other countries. Neonatal period (0 to 28 days of life) is the most hazardous period of life⁽²⁾. Neonatal period is the most vulnerable period of life due to different diseases⁽¹⁾.

The aim of the United Nations' Millennium Development Goal 4 (MDG4) is to reduce under-five mortality worldwide to 30 deaths per 1000 live births by 2015. Globally, an estimate of 10.6 million children under five years died in 2000, declining to 7.7 million in 2010. However, share of neonatal deaths increased from 37% in 2000 to 41% in 2008. The slow decline in neonatal mortality as compared to post-neonatal mortality calls for attention and efforts to reverse this trend⁽³⁾.

The major causes of neonatal deaths globally were estimated to be infections (35%), pre-term births (28%) and asphyxia (23%)⁽⁴⁾. It is estimated that 130 million infants born each year worldwide⁽⁵⁾ four million die in the first 28 days of life. Three quarters of neonatal deaths occur in the first week, and more than ¼ deaths occur in the first 24 hours^(5,6).

In the developed countries, the main cause of morbidity and mortality in the neonatal period is congenital abnormalities which are mostly non-preventable, but in the developing countries the common causes such as infections, jaundice, birth asphyxia and pneumonia predominate^(7,8).

Neonatal septicemia is one of the commonest causes of neonatal mortality and morbidity throughout the world, it is estimated that 20% of all neonates develop sepsis and is responsible for 30-50% of total neonatal death in developing countries

^(4,9). Neonatal morbidity and mortality is on increase day by day due to the lack of the available resources in developing countries.

Since causes of neonatal death vary by country and with the availability and quality of health care, understanding neonatal mortality in relation to these factors is crucial⁽⁹⁾.

Neonatal morbidity and mortality can be reduced by proper and timely intervention. And one of the Millennium Development Goals is to reduce the number of deaths in children under 5 years to two third by the year 2015, moreover to achieve this goal a substantial reduction in neonatal deaths will be required especially in the developing countries⁽¹⁰⁾.

Advances in neonatal management have made considerable improvement in survival of newborns but in developing countries neonatal morbidity and mortality both are still very high⁽¹⁾.

In Iraq Under-five child mortality is one of the highest in the Middle East region; deaths during the neonatal period accounted for more than half of under-five children deaths⁽¹¹⁾. The mortality rate for children under five in Iraq has declined significantly. Infant mortality has decreased from 50 deaths per 1,000 live births in 1990 to 35 deaths per 1,000 live births in 2006, and in 2011, there were approximately 32 deaths per 1,000 live births. However, this still remains almost double the 2015 target of 17 deaths per 1,000 live births⁽¹²⁾.

During 2013 in Erbil 28724 infants have been born at maternity teaching hospital and 36294 children were hospitalized at RPTH and 331 of them were died⁽³⁾. Because of high mortality rates of newborn in Erbil and Iraq and at the same time as the pattern of neonatal deaths in Erbil has not been previously reported, researcher decided to carry out this study.

Objectives of the study

This study aims to: (1) assess the disease patterns of neonates who were admitted to Neonatal Care Unit at Raparin pediatric teaching hospital (2) Identify the causes of death and outcome of disease at discharge (3) using the findings as a baseline for neonate's morbidity and

mortality assessment in the future.(4) find out the relationship between neonates diseases and some of their socio-demographic characteristics such as age .

Methodology

A retrospective study conducted at Neonatal Care Unit (NCU) of Raparin Pediatric Teaching Hospital (RPTH) in Erbil city of Iraqi Kurdistan Region.

Before data collection the ethical approval was obtained from the ethical committee at College of Nursing / Hawler Medical University and RPTH for granting patient's privacy and anonymity.

The NCU have two halls contains (25) incubator for neonates and involves facilities of resuscitation, phototherapy, radiant warmer, open and closed incubator facilities.

An instrument for data collection developed by researcher which contains the following items (age, gender, cause of admission, diagnosis and outcome upon discharge and causes of death).Validity of instrument tested by four experts from college of nursing and Raparin pediatric teaching hospital to determine the content validity of the instrument for achieving the present study's objectives.

A pilot study conducted on 25 newborns' medical records for obtaining reliability of the instrument format.

All the sick newborns' both born within the maternity hospital and outside, were managed in this unit. The data of all newborn 3880 who were admitted to NCU, from 1st January to 31st December of 2013 were reviewed as it was recorded in the medical records of the hospital.

The obtained data processed by a Statistical Package for Social Sciences (SPSS) version 19. Descriptive statistics and inferential statistics used for data analysis and the statistical procedures were tested at $P \leq 0.05$.

Wigglesworth's classification was used to classify causes of neonatal deaths into the following six groups: prematurity, infections, congenital malformations, respiratory dysfunction, Birth asphyxia, and specific diagnosis⁽¹⁴⁾.

Early neonatal death (END) is defined as death that occurs in up to six completed days following birth. Late neonatal death (LND) was defined as deaths between 7 and 28 days⁽²⁾.

Results

Table 1. Gender and age of 3880 newborns admitted to Neonatal Care Unit

| Variable | Attributes | F | % |
|----------|------------|------|-------|
| Gender | Male | 2252 | 58.0 |
| | Femal | 1628 | 42.0 |
| Age | < 7 days | 2959 | 76.26 |
| | 7- 29days | 921 | 23.74 |

F: Frequency, %: percentage

The total number of neonates admitted during 2013 was 3880 patient. There were 2252(58%) males and 1628 (42%) were females. Most of the neonates 2959 (76.26%) were admitted during the first week of life.

Table 2. Distribution of disease's pattern among admitted neonates (No.3880)

| No. | Diseases | F | % |
|--------------|--|-------------|------------|
| 1 | Jaundice | 2100 | 54.1 |
| 2 | Reason not recognized | 768 | 19.79 |
| 3 | Neonatal Infection (11.04%) | | |
| | Bronchiolitis | 132 | 3.4 |
| | Urinary tract Infection | 34 | 0.9 |
| | Pneumonia | 38 | 1.0 |
| | Gastroenteritis | 118 | 3.04 |
| | Sepsis | 73 | 1.9 |
| | Un specified neonatal infections | 26 | 0.7 |
| 4 | Respiratory dysfunctions (8.9%) | | |
| | Respiratory distress syndrome | 31 | 0.8 |
| | Birth asphyxia | 50 | 1.28 |
| | Shortness of breathing* | 268 | 6.9 |
| 5 | Prematurity | 79 | 2.03 |
| 6 | congenital malformation | 42 | 1.08 |
| 7 | Neonatal Convulsion | 37 | 0.95 |
| 8 | Anemia | 30 | 0.77 |
| 9 | Hypoglycaemia | 8 | 0.2 |
| 10 | Hyperthermia | 4 | 0.1 |
| 11 | Surgical conditions | 18 | 0.46 |
| 12 | Other | 20 | 0.5 |
| Total | | 3880 | 100 |

No. Number, F: Frequency , %: percentage

*as it is written in the medical records

Table (2) indicates that jaundice was the cause of 54.1% of neonates admission, the causes of 19.79% admitted neonates' were not recognized and 11.04% of the newborns were admitted because of neonatal infections.

Table 3. Neonate's death distribution according to neonate's gender and age in 2013

| Months | Neonates gender | | Neonatal age | | Number of neonate deaths |
|--------------|-----------------|----------------|----------------|----------------|--------------------------|
| | FMD* | FFD** | FEND*** | FLND**** | |
| January | 13 | 13 | 19 | 7 | 26 |
| February | 9 | 3 | 11 | 1 | 12 |
| March | 9 | 5 | 10 | 4 | 14 |
| April | 10 | 6 | 14 | 2 | 16 |
| May | 10 | 10 | 18 | 2 | 20 |
| June | 12 | 6 | 16 | 2 | 18 |
| July | 12 | 6 | 14 | 4 | 18 |
| August | 15 | 5 | 19 | 1 | 20 |
| September | 4 | 5 | 8 | 1 | 9 |
| October | 16 | 9 | 22 | 3 | 25 |
| November | 11 | 8 | 9 | 10 | 19 |
| December | 7 | 4 | 6 | 5 | 11 |
| Total | 128 | 80 | 166 | 42 | 208 |
| % | (61.5%) | (38.5%) | (79.8%) | (20.2%) | (100%) |

* FMD: Frequency of Male Death, ** FFD: Frequency of Female Death, *** FEND: Frequency Early neonatal deaths, **** FLND: Frequency Late neonatal deaths.

Table (3) Reveals that during 2013 in RPTH the frequency of neonates death was 208, highest percentage 61.5% of them were male.

Table 4. Causes of deaths in Neonatal Care Unit

| No. | Causes | No. of deaths | % |
|--------------|--|---------------|------------|
| 1 | Prematurity | 74 | 35.6 |
| 2 | Infections (25.5%) | | |
| | Neonatal septicemia | 45 | 21.63 |
| | Pneumonia | 3 | 1.44 |
| | Bronchiolitis | 1 | 0.5 |
| | Gastritis | 4 | 1.92 |
| 3 | Congenital malformation | 39 | 18.8 |
| 4 | Respiratory dysfunction (10.1%) | | |
| | Respiratory Distress Syndromes | 6 | 2.9 |
| | Shortness of breath | 13 | 6.25 |
| | Meconium aspiration | 2 | 0.9 |
| 5 | Birth asphyxia | 12 | 5.8 |
| 6 | Convulsion | 3 | 1.44 |
| 7 | Encephalopathy | 4 | 1.92 |
| 8 | Others | 2 | 0.9 |
| Total | | 208 | 100 |

No.: Number, %: Percentage

Table (4) shows the causes of death were as following: prematurity 35.6%, infections 25.5%, congenital anomalies 18.8% and Respiratory dysfunction 10.1%.

Table 5: Outcomes of the neonatal admissions

| Outcome | F | % |
|----------------------------------|-------------|------------|
| Discharged | 171 | 4.4 |
| Referred | 7 | 0.2 |
| Leaving against medical advice | 81 | 2.1 |
| Death | 208 | 5.4 |
| Un specified discharge (outcome) | 3413 | 87.9 |
| Total | 3880 | 100 |

F:Frequency , %:percentage

Table (5) Indicates that 87.9% of neonates were discharged with unspecified discharge outcome.

Table 6. Association between neonate's diseases and neonate's age

| Diseases | Age | | Total No. | P-Value |
|--------------------------|--------------------|---------------------|-------------|------------|
| | < 7 days No.(%) | 7-28 days No.(%) | | |
| Jaundice | 1723(82) | 377(18) | 2100 | .000 HS |
| Prematurity | 60(76) | 19((24) | 79 | |
| congenital malformation | 34(81) | 8(19) | 42 | |
| Respiratory dysfunctions | 273(78) | 76(22) | 349 | |
| Neonatal Infection | 225(53) | 200(47) | 425 | |
| Surgical conditions | 11(61) | 7(39) | 18 | |
| Hypoglycaemia | 5(62.5) | 3(37.5) | 8 | |
| Hyperthermia | 2(50) | 2(50) | 4 | |
| Neonatal Convulsion | 30(82) | 7(19) | 37 | |
| Reason not recognized | 573(75) | 195(25) | 768 | |
| Anemia | 12(40) | 18(60) | 30 | |
| Other | 11(55) | 9(45) | 20 | |
| Total | 2959(79) | 921(21) | 3880 | |

No.: Number , %: Percentage , HS: High Significant

This table shows high significant association between neonate's diseases and neonate's age.

Discussion

In this study researcher depended upon hospitals statistical records in attempts to view the neonatal diseases pattern and deaths and spent a lot of efforts in arranging the current data which shows that 3880 neonates were admitted during 2013 to NCU , highest percentage (58%) of them were male and majority(76.26%) were admitted during the first week of life. Many studies presented supportive evidence to this results that found Raghvendra ⁽²⁾ , Hameed and Abed ⁽¹⁵⁾ , Ali and his associates ⁽¹⁶⁾ .This is most likely due to cultural and social factors, whereby

male neonates are more likely to receive medical care compared to females, as male neonates are more wanted by families.

The current study reveals that neonatal jaundice was the major cause of admission to NCU, study present supportive evidence that found Raghvendra ⁽²⁾ and unsupportive evidence to this result that found Nighat and his associates in Karachi who reported that preterm, low birth weight baby's account for the largest number of cases ⁽⁹⁾ .

The second cause of admission in current study was neonatal infections. Infections remain one of the major problems in pediatric intensive care unit

and are the leading cause not only of admissions but also mortality in developing countries^(7, 14). Followed by respiratory dysfunctions and others, while in the same time researcher found that (19.79%) of cases discharged with unrecognized admission reason as researcher thinks that those cases which left without mentioning the cause of admission is due to either parents left for hospital without permission, or high work load and shortage skillful people working in computer documentation at NCU and in the statistical departments of the hospital.

Among 208 neonates who did not survive, majority of neonatal deaths were occurred in early neonatal period (< 7 days), and happened in October and January when winter season starts in Erbil.

The most common leading cause of death was prematurity followed by infections, congenital anomalies and Respiratory dysfunction, similar result found by Shah and his associates⁽⁷⁾, Khinch and his colleagues⁽⁸⁾.

Concerning outcomes of the neonatal admissions to NCU of RPTH majority of admitted cases were discharged without determination of the discharge condition.

This study also indicates high significant relationship between neonate's diseases pattern and their age as highest percentages of hospitalized neonates diseases related to early neonate's age. The study present supportive evidence that found Ali and his associates⁽¹⁶⁾.

limitation of the study was lack of information in patients records so researcher depend on the records of the statistics units as a source of information and the records of the statistics units was not classified the diseases according to the standards so researcher faced difficulties in organizing and categorizing information in attempted to adapt it with the standard classification.

Recommendations

Researcher recommended improving health care teams' skill of statistical documentation and conducting further studies about the quality of care in NCU

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