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Causes of admission in the Neonatal intensive care unit in Al-Batool teaching hospital

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Abstract

Background: The neonatal phase, which is the first 28 days of an infant's life, is a vulnerable period due to many reversible severe illnesses. Low infant birth weight and premature babies are at a higher risk and are universally acknowledged as the ranking causes of morbidity and neonatal deaths.

Objective: to identify the causes of admission to ICU in Al-Batool teaching hospital in Diyala, Iraq.

Patients and methods: This is cross sectional study. a sample of 100 neonate under 58 days who were admitted to the ICU in Al-Batool teaching hospital in the period from October 2022 to March 2023 was collected. Every neonate was eligible and babies aged more than 60 days were excluded. the information was collected by using prepared written questionnaire and by direct interview with the mothers.

Results: one hundred neonates were enrolled in this study. The mean age was 16.24 days and 55% of them were males and 45% of them were females. The mean maternal age was 26.2 years. None of the mothers are smokers and 12% of the took chronic drugs to treat the Hypertension, DM and anemia. 15% of the mothers had chronic diseases. The study found significant association between the ARI and the mechanical ventilation.

Conclusion: acute respiratory infection and sepsis, jaundice, Low birth weight and dyspnea are the most common causes of ICU admission in Al-Batool teaching hospital.

Introduction

The neonatal phase, which is the first 28 days of an infant's life, is a vulnerable period due to many reversible severe illnesses. Low infant birth weight and premature babies are at a higher risk and are universally acknowledged as the ranking causes of morbidity and neonatal deaths. According to the World Health Organization, of the 130 million newborns, four million will die during the neonatal period, and half neonatal deaths (i.e., 50%) occur within the first 24 hours of life [1].

The NICU must have highly sophisticated facilities and equipment to address critical cases, facilitate adjustment of the newborn to the extra-uterine life, and establish and maintain normal respiration of a high-risk newborn. Although NICU helps to reduce preterm mortality, it is scarce and is a financial burden on the healthcare system in developing countries [2].

Improving the quality of neonatal care provided at facility level is one way to decrease neonatal mortality. Quality improvement of neonatal care service can be achieved by improving the skills and knowledge of health care provider in addition to availing them with the equipment and resources required for quality care [3].

One of the Millennium Development Goals is to reduce the number of under 5 years child death by two third by the year 2015 and to achieve this goal a substantial reduction in early neonatal deaths will be required especially in the developing countries [4]. In the developed countries, the main cause of mortality and morbidity in the neonatal period are non-preventable causes such as congenital abnormalities, but in the developing countries the preventable causes such as

Infections, Jaundice, Birth Asphyxia and Pneumonia predominate. The neonatal disease pattern is a sensitive indicator of availability, utilization and effectiveness of mother and child health services in the community [5].

Aim of study

The aim of this study was to identify the causes of admission to ICU in Al-Batool teaching hospital in Diyala, Iraq.

Patients and methods

This is cross sectional study. A sample of 100 neonate under 58 days who were admitted to the ICU in Al-Batool teaching hospital in the period from October 2022 to March 2023 was collected. every neonate was eligible and the exclusion criteria included the babies aged more than 60 days.

The information were collected by prepared questionnaire and by direct interview with the mothers. It included questions about age, maternal age, gestational age, interventions in ICU, any maternal chronic diseases and history of smoking. The privacy and confidentiality of the participants were preserved.

Statistical analysis

The data was introduced in qualitative variables. The data was analyzed by number, percent and proportion. Chi square was used to analyze the variables. P value < 0.05 was considered significant.

Results

One hundred neonates were enrolled in this study. The mean age was 16.24 days and 55% of them were males and 45% of them were females. The mean maternal age was 26.2 years. 97% were alive and 3 of them were dead and their death causes were (ARI, sepsis and CHD).

the distribution of gestational age is demonstrated in table 1.

Table 1. the distribution of gestational age groups of neonates in ICU

GA in weeks	Frequency	Percent
28-34 weeks	15	15.0
35-36 weeks	15	15.0
> 37 weeks	70	70.0
Total	100	100.0

As shown in the table 1, the majority of them (67%) were terms and (30%) of them were preterms.

Their mean weight was 2.6 kg and 27% of them were critical cases.

Table 2. the distribution of birth weight of neonates in the studied group

Weight categories	Frequency	Percent
> 2500 grams	68	68.0
2000-2500 grams	16	16.0
1500-2000 grams	7	7.0
< 1500 grams	9	9.0
Total	100	100.0

The causes of admission are demonstrated in table 3.

Table 3. distribution of causes of admission to the ICU

Causes	Count	Percent
Acute respiratory infection	63	63
Jaundice	48	48
Low birth weight	32	32
Loss of consciousness	2	2
Dyspnea	30	30

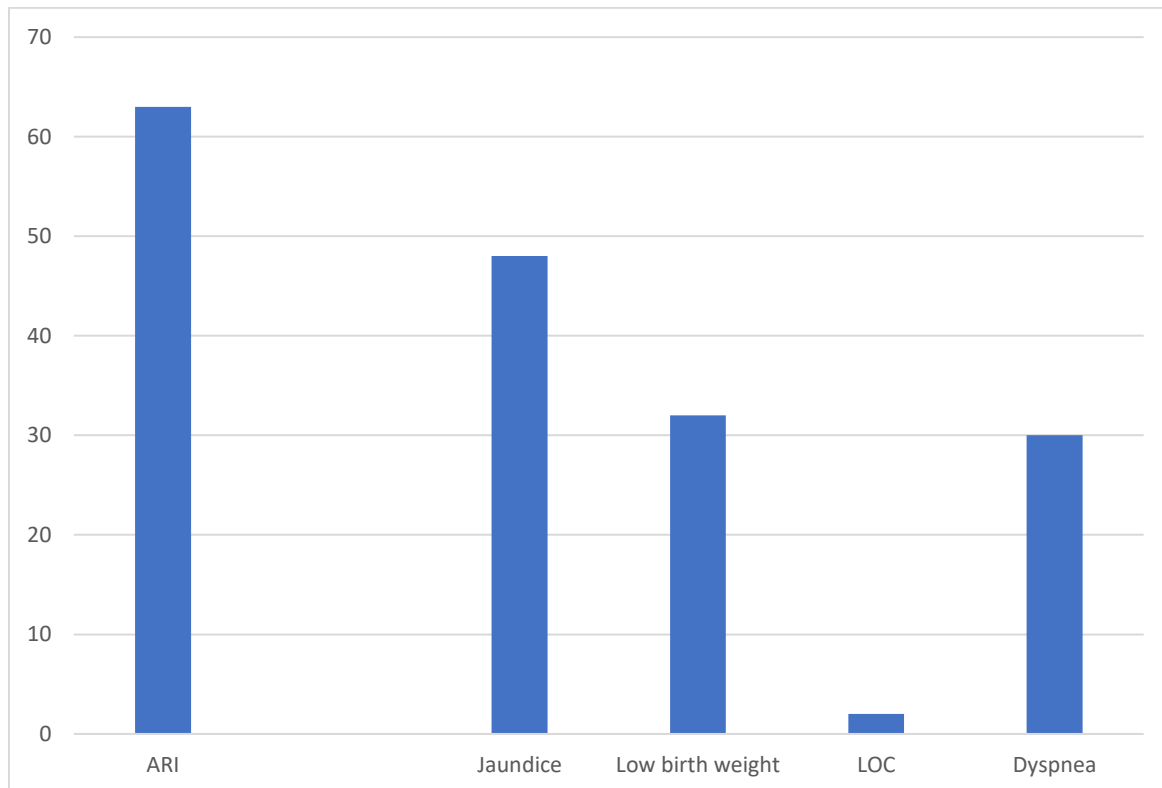


Figure 1. causes of admission to ICU in the studies group.

The interventions in ICU are summarized in table 3.

Table 4. distribution of interventions in ICU.

Intervention	No.	Percent
Incubation	91	91
O2 (Nasal)	80	80
Nasogastric tube	81	81
Mechanical Ventilation	14	14

15% of the mothers had chronic diseases and they are summarized in table 4.

Table 5. chronic diseases

Chronic diseases	No.	Percent
DM	5	5.0
Hypertension	5	5.0
Thyroid	1	1.0
Anemia	4	4.0
Total	15	15

None of the mothers are smokers and 12% of the took chronic drugs to treat the Hypertension, DM and anemia.

The study showed significant association between the ARI and the mechanical ventilation as in table 5.

Table 6.

ARI	Mechanical Ventilation		Total	Sig.
	Yes	No		
Yes	13	50	63	P = 0.013
No	1	36	37	
Total	14	86	100	

It was found increased usage of mechanical ventilation among the preterms as in table 7.

Table 7. distribution of mechanical ventilation among age groups

Gestational age	Mechanical Ventilation		Total	Sig.
	Yes	No		
28-32 weeks	4	11	15	P < 0.001
32-36 weeks	7	8	15	
37-40 weeks	3	64	67	
More than 40 weeks	0	3	3	
Total	14	86	100	

Discussion

The present study reported that ARI was the commonest cause with 63% and severe jaundice with 48% and the LBW were found to be the three predominant causes of neonatal admissions. The proportions of these causes of admission goes with different studies conducted in the world [6], Similar to this study neonatal sepsis and low birth weight were found to be within the top three leading causes of neonatal admissions in other several studies conducted outside Iraq [7]. This implies that major causes of neonatal admissions were attributed to avoidable and curable neonatal conditions and would be preventable if detected early and proper care were in place.

This study showed that 61% of admissions were during the 1st week of life. the study also showed a male predominance 55%, the finding of our study is consistent with other studies conducted at different places nationally and internationally [8].

Neonatal jaundice was 48%, as compared to study done in Bangladesh [9] where the incidence of sepsis was 43.3%. Similarly incidence of jaundice in other studies were. The changing pattern of neonatal jaundice may be due to environmental variations.

It was found that there was a strong association between the Acute respiratory infection and prematurity with the usage of mechanical ventilation ($P < 0.05$) which may be due to the fragility of the lung tissue [10].

Proper training of the health care provider on how to detect fetal jeopardy during labor and delivery and also on how to identify risk factors for asphyxia can help prevent asphyxia. Providing training on neonatal resuscitation to health care providers who attend labor and delivery is also very important in preventing

asphyxia. Addressing some of the factors, which can lead to premature labor, could help to arrest preterm delivery [11]. Hence, the fact that prematurity, sepsis, and dyspnea were common causes of admission in our center could imply the need to take appropriate measures to reduce these factors as cause of neonatal morbidity since some of the factors are preventable.

Conclusion

We concluded that the ARI and sepsis, jaundice, LBW and dyspnea are the most common causes of ICU admission in Al-Batool teaching hospital.

Recommendations

It was recommended that the doctors should focus on neonate and the staff should show more efforts in the monitoring of neonates in neonatal care unit.

References

1. Bajad M, Goyal S, Jain B. Clinical profile of neonates with respiratory distress. *Int J Contemp Pediatr*. 2016 Jul;3(3):1009-3.
2. Garg P, Bolisetty S. Neonatology in developed and developing nations. *The Indian Journal of Pediatrics*. 2007 Feb;74(2):169-71.
3. Lawn JE, Kerber K, Enweronu-Laryea C, Masee Bateman O. Newborn survival in low resource settings—*are we delivering?*. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2009 Oct;116:49-59.
4. United Nations. Resolution adopted by the General Assembly. S-27/2. A world fit for children. New York: United Nations; 2002.
5. Jehan I, Harris H, Salat S, Zeb A, Mobeen N, Pasha O, McClure EM, Moore J, Wright LL, Goldenberg RL. Neonatal mortality, risk factors and causes: a prospective population-based cohort study in urban Pakistan. *Bulletin of the world Health Organization*. 2009 Feb;87(2):130-8.
6. Mengesha HG, Sahle BW. Cause of neonatal deaths in Northern Ethiopia: a prospective cohort study. *BMC public health*. 2017 Dec;17(1):1-8.
7. Okposio M, Ighosewe OI. Morbidity and mortality pattern among neonates admitted to the general paediatric ward of a secondary health care centre in the Niger delta region of Nigeria. *Sri Lanka Journal of Child Health*. 2016 Jun 6;45(2).
8. Rahim F, Jan A, Mohummad J, Iqbal H. Pattern and outcome of admissions to neonatal unit of Khyber Teaching Hospital, Peshawar. *Pakistan Journal of Medical Sciences*. 2007 Apr 1;23(2):249.

9. Nahar J, Zabeen B, Akhter S, Azad K, Nahar N. Neonatal morbidity and mortality pattern in the special care baby unit of BIRDEM. Ibrahim Medical College Journal. 2007;1(2):1-4.
10. Chakkarapani AA, Adappa R, Mohammad Ali SK, Gupta S, Soni NB, Chicoine L, Hummler HD. "Current concepts of mechanical ventilation in neonates" - Part 1: Basics. Int J Pediatr Adolesc Med. 2020 Mar;7(1):13-18.
11. van Kaam AH, Rimensberger PC, Borensztajn D, et al. Ventilation practices in the neonatal intensive care unit: a cross-sectional study. J Pediatr 2010; 157:767.

أسباب دخول الأطفال حديثي الولادة الى ردهة العناية المركزة في مستشفى البتول التعليمي/ديالى/ العراق

الخلاصة: تعد مرحلة حديثي الولادة ، وهي أول ٢٨ يومًا من حياة الرضيع ، فترة حرجة بسبب العديد من الأمراض الشديدة التي يمكن عكسها. إن انخفاض وزن الأطفال عند الولادة والأطفال الخدج معرضون لخطر أكبر ومعترف به عالميًا كأسباب للمرض والوفيات في الأطفال حديثي الولادة.

الأهداف: لتحديد أسباب دخول الأطفال حديثي الولادة الى ردهة العناية المركزة في مستشفى البتول التعليمي.

طريقة البحث: هذه دراسة مقطعية. تم جمع عينة من ١٠٠ طفل تحت ٥٨ يومًا تم إدخالهم إلى وحدة العناية المركزة في مستشفى البتول التعليمي في الفترة من أكتوبر ٢٠٢٢ إلى مارس ٢٠٢٣. كان كل حديثي الولادة مؤهلاً لذلك واستبعدنا الأطفال الذين يزيد عمرهم عن ٦٠ يومًا. تم جمع المعلومات باستخدام استبيان مكتوب ومن خلال مقابلة مباشرة مع الأمهات.

النتائج: تم تسجيل ١٠٠ من حديثي الولادة في هذه الدراسة. بلغ متوسط العمر ١٦,٢٤ يوماً ٥٥٪ منهم ذكور و ٤٥٪ إناث. كان متوسط عمر الأم ٢٦,٢ سنة. لم تكن أي من الأمهات مدخنات وقد تناول ١٢٪ من الأدوية المزمنة لعلاج ارتفاع ضغط الدم والسكري وفقر الدم. ١٥٪ من الأمهات يعانين من أمراض مزمنة. وجدت الدراسة ارتباطاً كبيراً بين التهابات الجهاز التنفسي الحادة والتهوية الميكانيكية.

الاستنتاج: عدوى الجهاز التنفسي الحادة واليرقان وانخفاض الوزن عند الولادة وضيق التنفس هي الأسباب الأكثر شيوعاً لدخول وحدة العناية المركزة في مستشفى البتول التعليمي.

التوصيات: نوصي بأن يركز الأطباء على الاطفال حديثي الولادة ويجب على الكادر الطبي إظهار المزيد من الجهود في مراقبة الاطفال الخدج في وحدة العناية المركزة.