Indications of admission to the pediatric intensive care unit (PICU) in Al-Batool teaching hospital

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Abstract

Aim: To identify the causes of admission to the pediatric respiratory care unit in Al-Batool teaching hospital in Diyala Governorate.

Patients and methods: This is a cross sectional study. It was conducted in the period from July 2023 to January 2024. We collected 140 patients who have been admitted to the RCU. We collected the sample from the patients who attend Al-Batool teaching hospital. we collected information about age, weight, gender, any complications, chronic diseases, causes of admission, etc. we collected the information using prepared written questionnaire and by direct interview with the patients' parents.

Results: 140 patients were enrolled in our study. All of them were under 1 year old. the causes were mainly respiratory causes (80.7%), neurological (17%) and other causes (7.1%), (include, metabolic disturbances, major trauma or surgery, etc). 50% of them were supported by nasal cannula, 41.4% by CPAP and 8.6% by mechanical ventilation.

Conclusion: The rate of admission is high due to increased birth rate and multiple epidemics that impacted the Iraqi health system.

Introduction

The pediatric intensive care unit (PICU) concept was initially developed about 40 years ago with the first consensus conference on critical care admission held in 1983 by the National Institute of Health in the US. The group's guiding philosophy, which states that patients with "reversible medical conditions with a reasonable prospect of substantial recovery" should be admitted to the PICU, is still applicable today. The choice to admit a patient to the PICU should be made based on the possibility of benefit, just like with any treatment. Patients who are most likely to benefit from this level of care should be chosen for admission to pediatric intensive care. These individuals are typically very sick and unstable, with a good chance of recovering functionally following treatment for the acute illness (1).

It can be challenging to identify individuals who are either "too well" or "too severely ill" for PICU admission, especially if choices are made only on the basis of diagnosis. Similar to this, severity of disease ratings like the Simplified Acute Physiology Scoring, Acute Physiology and Chronic Health Evaluation, and Pediatric Risk of Mortality Score are insufficient and unreliable in identifying kids who will likely benefit from intensive care. The relationship between various pediatric triage systems and the following surrogate clinical outcome measures of severity has been assessed and analyzed: hospitalization rate, length of stay in the intensive care unit (ICU), predictive value for admission, and length of hospitalization (2).

Critically ill patients, particularly those with cerebral decompensation, hemodynamic instability, tissue hypoxia, or evidence of organ malfunction, need early diagnosis and treatment to survive. While clinical observation can identify these indications, enhanced monitoring in the intensive care unit may speed up the decision-making process. Moreover, there may be a higher chance of death if PICU admission is delayed. Early intensive treatment in patients who are critically sick or

rapidly deteriorating outside of the PICU is linked to a lower death rate, however (3).

In general, any pediatric patient—especially those with cancer or recipients of bone marrow transplants—who is at risk of severe acute deterioration, neurologic decompensation, hemodynamic instability or failure, or life-threatening dysfunction of at least one vital organ or system, or multiple organ or system failure, and who requires stabilization following severe surgical intervention, or who has pre- or post-operative conditions potentially associated with severe or life-threatening dysfunction of at least one organ or system, or who, due to the severity or potential severity of their condition, requires invasive and/or continuous monitoring, diagnosis and support of failing vital functions, or treatment of underlying diseases by a team specially trained in paediatrics (4).

Aim of study

To identify the causes of admission to the pediatric intensive care unit in Al-Batool teaching hospital in Diyala Governorate.

Patients and methods

This is a cross sectional study. It was conducted in the period from July 2023 to January 2024. We collected 140 patients who have been admitted to the ICU. We collected the sample from the patients who attend Al-Batool teaching hospital. we collected information about age, weight, gender, any complications, chronic diseases, causes of admission, etc. we collected the information using prepared written questionnaire and by direct interview with the patients' parents. We preserved the privacy and we coded the patients for the reasons of confidentiality and risk of bias.

Statistical analysis was done by using SPSS Version 25 for the description of the data. We expressed the quantitative data by arithmetic mean, standard deviation and mode and the qualitative data by frequencies.

Results

140 patients were enrolled in our study. Their gender is demonstrated in table 1.

Table 1. gender

Gender	Frequency	Percent
Male	86	61.4
Female	54	38.6
Total	140	100.0

The age groups are demonstrated in table 2.

Table 2. Age groups

Age groups	Frequency	Percent
Neonates (< 28 days)	87	62.1
1-3 months	26	18.6
3-6 months	8	5.7
6-12 months	19	13.6
Total	140	100.0

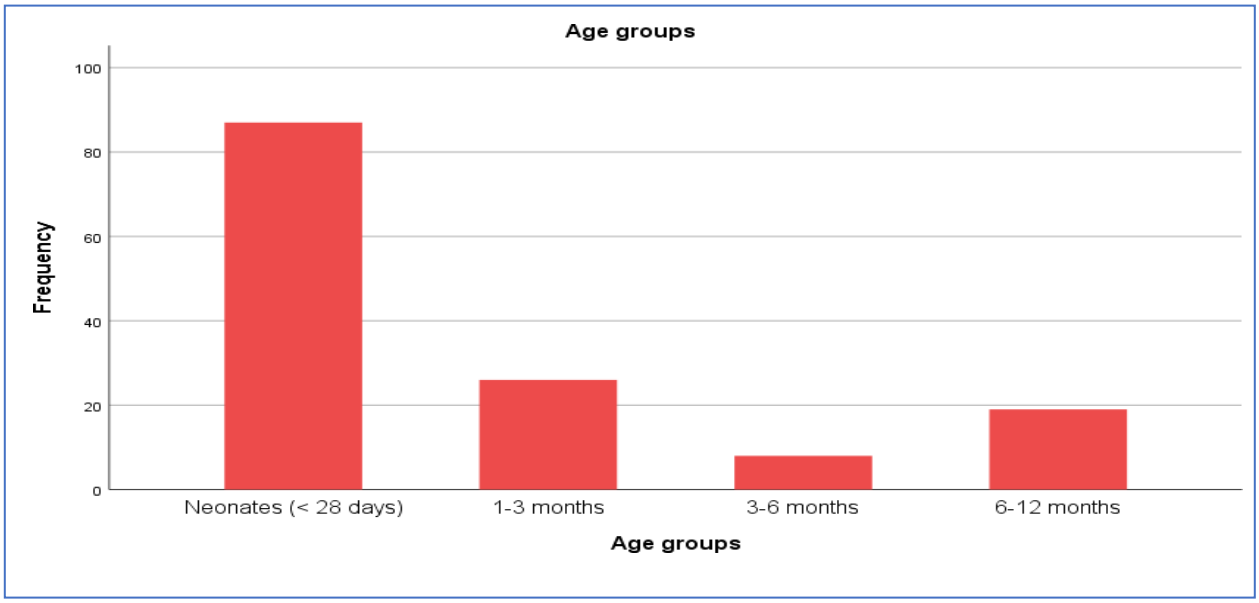

Figure 1. age groups

The causes of admission are demonstrated in table 3.

Table 3. causes of admission

Causes	Frequency	Percent
Respiratory cause	113	80.7
Neurological cause	17	12.1
Others	10	7.1
Total	140	100.0

As demonstrated in table 3 the causes were mainly respiratory causes (80.7%), neurological (17%) and other causes (7.1%), (include, metabolic disturbances, major trauma or surgery, etc).

The associated clinical features are enlisted in table 4.

Table 4. clinical features

Clinical features	Count	%
Dyspnea	116	82.9%
Tachypnea	74	52.9%
Convulsions	22	15.7%
Loss of consciousness	26	18.6%
Respiratory failure	33	23.6%
Metabolic disturbances	17	12.1%
Sepsis	10	7.1%
Congenital anomalies	8	5.7%

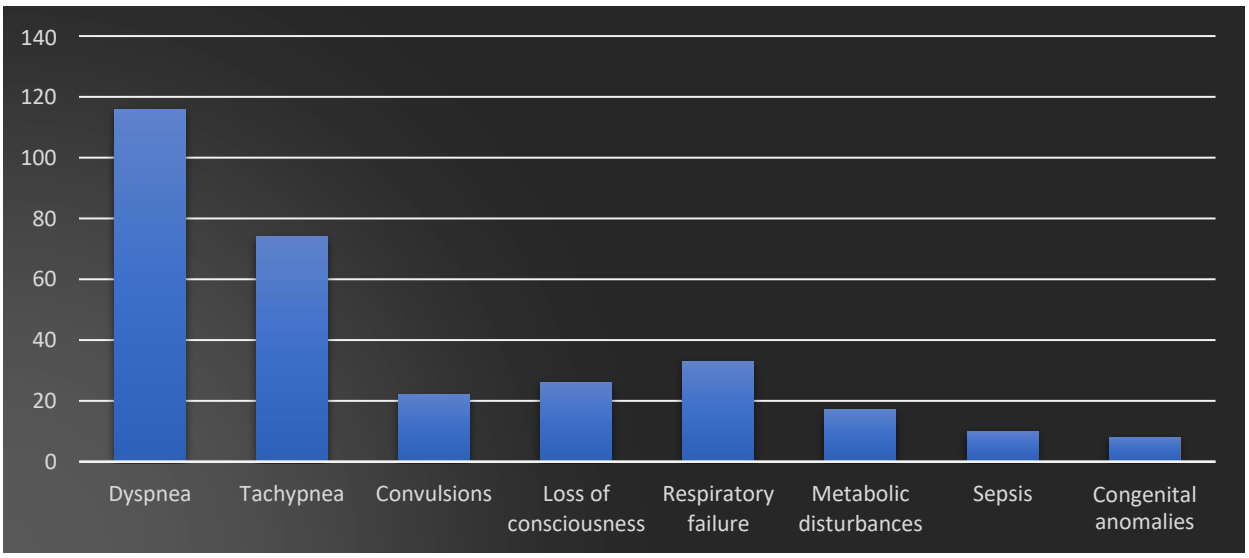

Figure 2. clinical features

The mode of respiratory support is demonstrated in table 5.

Table 5. mode of respiratory support

Mode	Frequency	Percent
Nasal cannula	70	50.0
CPAP	58	41.4
Mechanical ventilation	12	8.6
Total	140	100.0

Discussion

One of the hospital units where critically ill pediatric patients are admitted is the pediatric respiratory care unit (RCU). For severely ill children, better outcomes than if they were admitted to other areas of the hospital require sophisticated airway, hemodynamic, and organ supports. The critical care field has changed significantly in the previous thirty years. The treatment of critically ill patients has significantly improved as a result of developments in intensive care medicine (5).

The majority of pediatric patients admitted in this study were less than 28 days. This is in contrast to an Indian study that found that over 32% of patients were babies and over 36% of patients were between the ages of 1 and 5 (6). They discovered that newborns made up more than 50.7% of patients treated to pediatric intensive care. Notwithstanding these disparities, neither our study nor any other study found a statistically significant death rate related to age. Newborns made up the great majority of study participants.

A total of 140 ICU patient cases were examined. Ayder Referral Hospital (4%) and Gondar University Hospital (10%) are comparable to the general intensive care unit of Jimma University Specialized Hospital (37.1%) and the study conducted in Nepal (30%), which found that 8.6% of all patients admitted to the RCU required mechanical ventilation. Our hospital is a specialist referral hospital, but it is not the only hospital to which critical patients are referred from districts, zones, regions, and even from other tertiary and specialized hospitals, which explains why the proportion of mechanical ventilation required in our setup is so low.

In neonates 0-1 month of age respiratory diseases were the only causes of admission (100%). Respiratory problems still the major cause of admission (81.7%)

in children between more than 1 month and 1 year, followed by respiratory failure (23.7%), decrease level of consciousness (18.6%), convulsions (15.7%).

In nations with low resources, the field of intensive care medicine is still in its early stages (RLC). High rates of morbidity and death in RLC ICUs can be attributed to significant logistical and educational issues, as well as financial constraints resulting from poor insurance and national health systems (10).

Conclusion

The rate of admission is high due to increased birth rate and multiple epidemics that impacted the Iraqi health system. More work should be directed toward developing the current ICU wards and to build new wards in the remote areas to decrease the burden and to improve the medical service.