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An ECHO on the go: A case report on the importance of echocardiographic assessment skills in acute neonatal transport settings

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Abstract

The availability of Echocardiography (ECHO) skills is an important aspect of hemodynamic assessment in the management of neonatal patients [1]. It is recommended that a clinician with ECHO skills be on the acute neonatal transfer team, as neonatal transport has become one of the key components of neonatal critical-care services and uplift moves of sick neonates are quite frequent [2]. This case report demonstrates that the availability of neonatal ECHO can significantly contribute to better patient care.

In this case, a term infant showed signs of respiratory distress and required non-invasive respiratory support. A clinical examination suggested congenital heart disease in the differential diagnoses, and after discussion with the pediatric cardiology team, it was agreed to transfer the infant to receive a cardiac assessment, including detailed ECHO, at a tertiary center, as it was not available locally.

The Peninsula Neonatal Transport Service (PNTS) arrived, and the PNTS consultant conducted a physical examination and ECHO assessment, whereupon congenital cardiac diseases were excluded and the infant was diagnosed with poor transition and persistent pulmonary hypertension of newborn (PPHN). Because the infant's clinical condition improved, he continued to be cared for by the local Level-I neonatal unit near his parents. This case demonstrates that skills and expertise in performing an ECHO examination are important requirement within neonatal transport settings, as the ECHO examination may change the management plan to benefit the patient, especially when consultation with a specialized pediatric cardiology team is readily available. This case also highlights the importance of collaboration between various healthcare professionals, such as PNTS and Pediatric Cardiology.

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Background

A male infant was born at term through induced delivery due to reduced fetal movement. The infant was admitted to the local Level-I neonatal unit and required non-invasive respiratory support with heated, humidified, high-flow nasal cannula (HHHFNC). The baby was weaned from HHHFNC over a span of 10 hours and was on room air by 11 hours of age. Because the baby's mother had experienced low-grade pyrexia during labor, with a marginally prolonged rupture of membranes (19 hours) and signs of respiratory distress, the child underwent a partial septic screen that included blood tests for routine inflammatory markers, a blood culture, and a chest X-ray, after which he was started on first-line antibiotics (benzylpenicillin and gentamicin) per the local protocol. The chest X-ray showed non-specific small few localized areas of alveolar densities with normal cardiac silhouette. Since there was ≥ 10% difference between the pre- and post-ductal oxygen saturation measurements, the case was discussed with the pediatric cardiology team in light of the possibility of congenital cardiac disease. The specialized pediatric cardiology team advised that a detailed ECHO examination was required. Hence, the patient would need to be transported to the tertiary center, as the ECHO assessment was not available locally.

The PNTS neonatal consultant performed ECHO together with a clinical assessment of the patient. Discussions with the specialized pediatric cardiology team and an ECHO assessment analysis led to the diagnosis of poor postnatal transition with PPHN and the exclusion of congenital cardiac diseases.

The infant was clinically very stable, in an improved condition, and maintaining normal oxygen saturation with no respiratory support, so he continued to be cared for by the local neonatal team at the Level-I neonatal unit rather than being taken to the cardiac center.

Regular communication was maintained with the patient's parents throughout the entire encounter. Such communications are crucial during this stressful time, enabling parents to understand the steps and the rationale behind the decision-making process [3].

Discussion

This case demonstrates that echocardiography expertise allows the neonatal retrieval team to make an on-site decision regarding a very stable infant with suspected congenital heart disease, especially when the main need for the move is to perform cardiac assessment together with ECHO examination at the tertiary cardiac center.

The collaboration between the neonatal retrieval team and the specialized pediatric cardiac team is another crucial aspect of management. Hence, the initial plan of retrieving the patient to the tertiary cardiac center was changed to continued treatment at the local Level-I neonatal unit, where he could be near his parents and avoid, in this case, an unnecessary separation, which can adversely affect the process of emotional attachment and bonding between a baby and his or her parents [4].

Having an appropriate network of professionals with the skills to perform, analyze and communicate echocardiographic examinations in a neonatal transport setting can make possible a rapid and accurate diagnosis to identify neonates who require transfer to a tertiary care center [5,6].

Conclusion

ECHO examination skills in a neonatal retrieval team, together with access to specialized pediatric services such as pediatric cardiology, are of utmost importance, as the early diagnosis of patients' underlying clinical problems contributes to the appropriate management of their flow according to their clinical needs and required level of care across neonatal-care networks.

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