UTILITY OF THE BLUE (BEDSIDE LUNG ULTRASOUND IN EMERGENCY) PROTOCOL IN ACUTE UNDIFFERENTIATED DYSPNEA AMONG PEDIATRIC PATIENTS

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INTRODUCTION

Breathing difficulty, or dyspnea, accounts to 5% of emergency room visits which could be explained by an array of differential diagnosis.[1-4] An easy, noninvasive approach will help identify respiratory failure early, reducing the risk of unnecessary tests and procedures. This cross-sectional study aimed to evaluate the effectiveness of the BLUE (Bedside lung ultrasound in emergency) protocol compared to clinicoradiologic diagnosis for promptly identifying acute undifferentiated dyspnea in pediatric patients.

METHOD

The study was conducted at the emergency room of PCMC from August 2022 to May 2023, and involved performing the BLUE protocol within 2 hours of patient arrival. Chest radiography was also conducted, with images independently interpreted by a pediatric pulmonologist, emergency medicine specialist, and radiologist.

RESULT

A total of 111 participants were included, with the majority being male (55.4%) and under 1 year old (48.2%). Pneumonia was the most commonly observed diagnosis (88.2%), followed by asthma (7.2%). Utilizing the BLUE protocol, pneumonia was identified as the most prevalent diagnosis (81%), followed by pleural effusion (12.6%) and asthma (6%). The pulmonologist, emergency medicine specialist, and radiologist exhibited high sensitivity in diagnosing pneumonia (91.01%, 89.89%, 96.77% respectively) but low specificity (26%, 21%, 57.89%). All readers demonstrated high specificity (95%, 93%, 93%) and low sensitivity (50%, 71%, 71%) in diagnosing asthma. The ultrasound readings between the readers exhibited a high concordance rate of 98%.

DISCUSSION

The study findings show that the BLUE protocol has high sensitivity in diagnosing pneumonia and high specificity in diagnosing asthma. The high concordance rate among readers suggests consistent ultrasound findings. These results support the practical application of the BLUE protocol for promptly diagnosing acute undifferentiated dyspnea in pediatric patients within the emergency department.

Keywords: dyspnea, chest radiography, chest ultrasound