The application of lung ultrasound in the diagnosis and antidiastole of neonatal lung diseases: The experience from China

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Background: Ultrasound has been used extensively for the diagnosis of lung diseases including in neonatal intensive care unit (NICU). We have developed this technique in NICU for the diagnosis and differential diagnosis of neonatal lung diseases since January, 2011. Till now, a total of 6184 infants were accepted more 20,000 times lung ultrasound examinations. We found that almost all kinds of lung diseases can be diagnosed accurately by lung ultrasound.

Methods: Generally, the diagnoses of lung diseases were based on medical history, clinical manifestation, laboratory examination and the findings of chest radiography (CR) and/or computed tomography (CT). The ultrasonographic features of different lung diseases were compared with above traditional findings.

Results: There were 1597 cases without lung disease and 4587 cases were diagnosed as different lung diseases, including transient tachypnea of newborn (TTN) 1296 cases, respiratory distress syndrome (RDS) 1104 cases, pneumonia 1056 cases, meconium aspiration syndrome (MAS) 429 cases, pulmonary atelectasis 242 cases, pulmonary hemorrhage 107 cases, pneumothorax 86 cases, pulmonary edema 242 cases (who couldn't be included to other diseases), 25 infants were misdiagnosed as atelectasis in fact that they were thymus gland. Different lung disease has different ultrasonographic characteristics, generally, however, the main signs of lung disease on LUS were as following: pleural line abnormalities, absence of A-lines, lung consolidation with air bronchograms, interstitial syndrome, lung sliding disappearance, lung pulse, lung point double-lung point compact B-line dan white lung.

Conclusion: Ultrasound is advantageous in diagnosing neonatal lung diseases because of the following benefits: low cost, easy to learn and operate, non-invasive, harmless to the human body, and suitable for ongoing monitoring. Ultrasound is accurate and reliable and thus has an important value in guiding treatment and can replace X-ray as the preferred imaging method of neonatal lung diseases.

Biography

Jing Liu is the Leader and the Director of the Center of Neonatal Intensive Care Unit, Beijing Chaoyang District Maternal and Child Health Care Hospital and Bayi Children's Hospital Affiliated With the Army General Hospital of the Chinese PLA. His research interest is neonatal critical care, his academic positions includes the Associate Chairman of Committee of PLA Academy of Pediatric, the Associate Chairman of Neonatal Neurologist Committee of Chinese Neonatologist Association and Editorial Member of 20 Chinese or English Journals, etc. He has published over 260 papers as a First Author, 10 Books and Chapters in Books. His research work has been supported by China Natural Science Foundation and China Post-doctoral Science Foundation, etc., and he has won 12 awards for Science and Technology of The Government of China.

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