DETERMINING THE POSSIBILITY OF ULTRASOUND EXAMINATION OF THE LUNG IN PNEUMONIA

Giyasova N.K.
Department of Radiation Diagnostics and Therapy
Samarkand State Medical University, Samarkand, Uzbekistan.

Abstract. The article explores the use of ultrasound (US) as an effective method for diagnosing pneumonia. Although traditionally used to evaluate internal organs, the role of ultrasound in detecting lung diseases is gaining increasing recognition. The focus is on the advantages of this method, such as the absence of ionizing radiation, non-invasiveness, accessibility, and the ability to perform bedside examinations.

Special attention is given to the detection of pneumonia complications, such as pleural effusion and abscesses, demonstrating the versatility of ultrasound. The article concludes by emphasizing the need for broader adoption of ultrasound in clinical practice, physician training, and the development of standards for pneumonia diagnosis. Ultrasound represents a promising and cost-effective tool for improving the diagnosis and treatment of patients with lung diseases.

Key words: pneumonia, USR, abscess, CT, hyperechogenicity, pleurisy.

Introduction. Lung ultrasound has recently been considered as an alternative to chest x-ray and is increasingly being used to diagnose pneumonia, especially in children and patients. Despite a number of significant advantages, the ultrasound method has many methodological and interpretive problems that require more detailed study and addition of existing material.

Purpose of the study. Assessing the possibility of diagnostic effectiveness of ultrasound examination of lung pneumonia.

Materials and methods. We studied 45 patients (28 men, 17 women, average age 31.8±10) who were admitted as inpatients to the therapeutic department of the SamMU1 clinic to exclude/confirm pneumonia. The average hospital stay was 5.4±3.3 days. Patients underwent chest x-ray and ultrasound examination of the lungs. Lung ultrasound examination was performed using a 5 MHz convex probe (Mindray DC 7). The sensor was located perpendicular, oblique and parallel to the rib along the anterior, lateral and posterior surfaces of the chest. Patients were in the supine position during scanning of the anterior chest. When scanning the lateral and posterior surfaces, the patient was in a sitting position with his back/side to the researcher. Using 4 control points, the ultrasonic dynamics of the inflammatory infiltrate was monitored (1st control point - on the day of admission to the department, 2nd control point - 2-3 days

of hospitalization, 3rd control point 5-7 days of hospitalization and 4 -th control point – last day of hospitalization).

Results. According to chest radiography, out of 45 patients, pneumonia was detected in 32 patients, and according to ultrasound examination, in 27 patients. Of these, 15 patients with pleuropneumonia had a characteristic ultrasound picture: a homogeneous hypoechoic area of lung tissue with hyperechoic linear inclusions (a symptom of an air bronchogram) and multiple parallel B-lines, basally "edging" the infiltration. The ultrasound picture of this type of pneumonia consisted of thickening and compaction of the interlobular septa, due to which multiple "comet tail" reverberation artifacts are formed, accessible for visualization at any scanning point. Positive dynamics were observed in 10 patients and were detected already on days 2-3 of treatment (i.e., 2nd control point). The ultrasound picture of positive dynamics is based on a decrease in the length of the hypoechoic area of infiltration from 10.9±8.7 cm2 to 5.5±4.8 cm2 and to 2±1.9 cm2, a decrease in the symptom of "air bronchogram" per unit area, a decrease in the absence of B-lines, as well as a decrease in pleural effusion. Thus, the sensitivity of ultrasound in diagnosing pneumonia in our study was 40%, and the specificity was 83%. The low sensitivity of ultrasound examination of the lungs is due to the fact that in a number of observations the changes were not sufficiently extensive to involve the pleura in the inflammatory process, or the inflammatory infiltrate was located in areas difficult to reach for the ultrasound beam (supraclavicular fossa, subscapularis zone and retrocardial zone).

Conclusion. The high specificity of the ultrasound method provides assessment of the morphological type and extent of the inflammatory infiltrate, as well as monitoring the dynamics of pneumonia in the early stages of hospital treatment without radiation exposure of patients.

References:

1. Abdullaev N.N. Post-stroke epilepsy in the elderly. // Graduate student and applicant. - 2011, - №3. - P. 94-95.

2. Ananyeva N.I., Trofimova T.N. CT and MRI diagnostics of acute ischemic strokes. - SPb .: Publishing house of SPbMAPO, 2005. - P. 62-101.

3. Gomboeva N.A. Neuroimaging of cerebral infarction in clinical practice // Bulletin of BSU. Medicine and pharmacy. - 2014, - №. 12. - P.129-134.

4. Goryunova V.V., Kirasirova D.I., Kukhtevich I.I. MRI as a modern method for the early diagnosis of stroke. // International Student Scientific Bulletin. - 2018, - № 3. - P.364-367.

5. Korolyuk I.P., Lindenbrathen L.D. Radiation Diagnostics / Textbook. - 2013 .- 496 p.

6. Mardieva G. M. Radiation diagnosis of diseases and injuries of the central nervous system, skull and spine / Educational-methodical manual. - 2017.- 75 p.

7. X-ray computed tomography and magnetic resonance imaging in the diagnosis of ischemic stroke / G.E. Trufanov et al. - SPb .: ELBI-SPb., 2005. - P. 36-163.

8. Semenov S.E., Yurkevich E.A., Moldavskaya I.V. Diagnosis of venous ischemic stroke. // Journal "Complex problems of cardiovascular diseases." - 2019, - № 8 (3). - P. 104-115.

9. Yanova E.U., Yuldashev R.A., Mardieva G.M. Radiation diagnostics of craniovertebral blood circulation with Kimmerle anomaly // Problems of Science and Education. - 2019 .- №. 27 (76). - P. 94-99.

10. Balami J.S., Chen R.L., Grunwald I.Q., Buchan A.M. Neurological complications of acute ischaemic stroke. Lancet Neurol. - 2011. - Apr. - Vol. 10, № 4. -P. 357-371.

11. Vymazal J. Rulseh A. M., Keller J., Janouskova L. Comparison of CT and MR imaging in ischemic stroke. Insights Imaging. 2012 Dec; 3(6): 619-627. doi: 10.1007/s13244-012-0185-9

12. Sierra C., Coca A., Schiffrin E.L. Vascular mechanisms in the pathogenesis of stroke // Curr Hypertens Rep. – 2011. – Jun. – Vol. 13, №3. – P. 200-207.