Comparison of a pocket-size ultrasound device with a premium ultrasound machine: diagnostic value and time required in bedside ultrasound examination.

Abstract:

Time savings and clinical accuracy of a new miniature ultrasound device was investigated utilizing comparison with conventional high-end ultrasound instruments. Our objective was to determine appropriate usage and limitations of this diagnostic tool in internal medicine. We investigated 28 patients from the internal-medicine department. Patients were examined with the Acuson P10 portable device and a Sonoline Antares instrument in a cross-over design. All investigations were carried out at the bedside; the results were entered on a standardized report form. The time for the ultrasound examination (transfer time, setting up and disassembly, switching on and off, and complete investigation time) was recorded separately. Mean time for overall examination per patient with the portable ultrasound device was shorter (25.0 ± 4.5 min) than with the high-end machine (29.4 ± 4.4 min; p< 0.001). When measuring the size of liver, spleen, and kidneys, the values obtained differed significantly between portable device and the high-end instrument. In our study, we identified 113 pathological ultrasound findings with the high-end ultrasound machine, while 82 pathological findings (73%) were concordantly detected with the portable ultrasound device. The main diagnostic strengths
of the portable device were in the detection of ascites (sensitivity 80%), diagnosis of fatty liver, and identification of severe parenchymal liver damage. The clinical utility of portable ultrasound machines is limited. There will be clinical roles for distinct clinical questions such as detection of ascites or pleural effusion when used by experienced examiners. However, sensitivity in detecting multiple pathologies is not comparable to high-end ultrasound machines.