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Pocket ultrasound device helps health personnel detect early signs of dehydration or heart failure

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Detecting fluid retention in patients early is important to prevent their heart failure from getting worse. Nurses who are trained in the use of handheld pocket ultrasound devices can dispense diuretic drugs more precisely. These medications prevent harmful fluid retention in patients with heart failure.

Researchers at Levanger Hospital and the Norwegian University of Science and Technology (NTNU) have published a study showing that cardiac nurses who have learned to use pocket ultrasound devices can accurately calculate fluid retention both in the pleural cavities (between the two membranes surrounding the lungs) and the inferior vena cava of heart failure patients.

Diuretic medications are the best treatment for fluid retention. Researchers have now found that determining how much fluid has accumulated in heart failure patients with the use of pocket ultrasound technology can be clinically important in treatment.

According to Guri Holmen Gundersen, who is an academic and research nurse and the first author of the study, researchers found that a relatively high proportion of patients who came in for monitoring at the heart failure clinic had pleural effusion, sometimes referred to as "water in the lungs." "In addition," she says, "we found that the ultrasound examination significantly predicted diuretic dosing compared to other routine examinations and blood tests".

The study is based on the surveys of 62 patients who visited the heart failure outpatient clinic at Levanger Hospital on a total of 119 occasions.

Two specialized nurses examined them each time, one using a pocket ultrasound and one not using the device. Following the exam, each nurse and cardiologist team discussed adjustments to the patient's treatment plan.

In 89 of the paired consultations between the nurse and the cardiologist, the two teams (with and without ultrasound) agreed regarding diuretic dosing, meaning the ultrasound examination changed the treatment in 30 of 119 cases.

"Using a pocket ultrasound device enables health personnel to detect signs of dehydration or worsening heart failure early, before the patient experiences symptoms of breathlessness, weight gain and oedema. Proper diuretic dose adjustment can quickly improve the patient's condition and prevent episodes of acute exacerbation of the disease that would require hospitalization," says Gundersen.

In the study, pleural effusion was found to be present in 42% of the patients, which shows that this is common in heart failure.

Using the handheld ultrasounds to measure the volume of fluid retention was the single factor with the greatest impact on the dosage amounts prescribed for patients and on any dosage changes in follow-up visits.

More aggressive treatment of new fluid retention occurrences can restore fluid balance and potentially improve the prognosis of patients.

Researchers see promise in these study findings, but stress that it remains to be seen whether the effects of adjusting the medication dosage will have clinical significance for patient progress over the longer term.

Source:
The Norwegian University of Science and Technology (NTNU)
