

Background

- Acute cholecystitis is a common consideration for emergency department patients presenting with abdominal pain. Ultrasound is the gold standard and primary imaging study used in presumed cholecystitis.¹ Obesity is a known risk factor for the development of gallstone disease.² Obesity prevalence has not only increased health issues and the cost of healthcare, but also created a challenge in obtaining high-quality ultrasound images in a population at higher risk for cholelithiasis.³ The purpose of our study is to determine the effect of a body mass index (BMI) of 30 kg/m² or greater on ultrasound accuracy in diagnosing severe acute cholecystitis.

Is Ultrasound Accurate in Predicting the Severity of Acute Gallbladder Disease in Patients with Obesity?

Erica A. Amianda, PA-C, Meredith S. Gardner, PA-S, Christina Trutescu, PA-S, Elizabeth A. Vander Valk, PA-S, Danielle F. Fortini, PA-S, Gabrielle C. Rosati, PA-S, Sebastian R. Eid, MD, & Toghrul Talishinskiy, MD

Methods

- After obtaining approval from our institutional review board, a retrospective chart review was performed on 392 patients who were admitted through the emergency room at a single academic medical center and underwent a cholecystectomy between January 1, 2019 and December 31, 2019. Patients who underwent ultrasound imaging no more than 7 days prior to their procedure were included. Data for a total of 374 subjects were analyzed to determine if a BMI of 30 kg/m² or greater affected the correlation between ultrasound findings (scored 1 – 4 based on number of positive findings) and severe gallbladder disease defined as gangrenous or necrotic.

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Results

- We hypothesize that the excessive abdominal adipose tissue associated with increase BMI significantly diminishes the quality of ultrasound imaging, ultimately limiting its accuracy in diagnosing the severity of acute cholecystitis. A two-way ANOVA was run to examine the effects of body mass index on ultrasound results in severe gallbladder disease. There was no significant interaction between BMI and severity of disease $F(1,370) = 0.85, (p=.356)$. There was no statistically significant difference in ultrasound results if the BMI was above or below 30. ($p=.262$), but there were significant differences in ultrasound results and severity of disease ($p=.03$).

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Discussion

- Despite the potential limitations and reduced quality of ultrasound imaging in patients with obesity, there was no significant difference in ultrasound results that indicate severe cholecystitis. These findings support continued use of ultrasound alone for assessment of severity of this common acute gallbladder disease, without the necessity of additional imaging or testing.
- Limitations of this study include variability of ultrasound technicians, interpreting radiologists, and the size of our sample. Further research should be encouraged in a setting where consistency may be implemented in this regard.

References

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