Specificity of Ultrasonography in Diagnosis of Liver Cirrhosis: Does APRI Improve Accuracy?

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Case Series

Purpose: Ultrasonography (US) is commonly used in evaluation of liver disease. If cirrhosis could be reliably diagnosed on US, it would be useful and might obviate the need for additional testing. There is scant data on the specificity (Sp) of US. A recent study from Japan and China evaluated 142 patients with surgically resected HCC. They found that the Sp of US in diagnosis of liver cirrhosis to be 73.5%. We sought to evaluate the Sp of US in patients with liver disease without clinical evidence of cirrhosis or portal hypertension. We further studied whether combining US findings with APRI scores improved Sp for cirrhosis. Determining the level of cirrhosis is important in surveillance of patients infected with hepatitis C.

Methods: We reviewed all patients who had a dedicated US prior to liver biopsy (Bx) from January 1st, 2003 through December 31st, 2011 at our medical center. This yielded a total of 79 patients. The Metavir cirrhosis staging system was used with cirrhosis being F4 and significant fibrosis labeled as a combination of F3 and F4. APRI scores within 3 months of liver Bx were available for only 31 of the 79 patients with dedicated US. Sensitivities (Sn), specificities, negative and positive predictive values were calculated for US and US with APRI score in detecting significant fibrosis (F3/F4) and cirrhosis (F4). Results: A total of 79 US evaluations of the liver were performed which had complete data. The distribution of gender was 84.8% male and 15.2% female. The patient ethnicity was 46.8% Caucasian, 30.4% African American, and 22.8% other. The results of our study can be seen in the table below. When APRI scores were added, the results were affected greatest for F3/F4 raising the Sn to 76.2%, while just the F4 Sn was only 72.2%. The most common indication for imaging was hepatitis C (64.4%), followed by abnormal liver function tests (21.9%) and hepatitis B and C (4.1%).

Conclusion: Non-invasive imaging is a vital part of monitoring and evaluation of liver cirrhosis. The gold standard for evaluation of liver cirrhosis is still a liver biopsy. Our study showed that the combination of APRI scores and US imaging increased the sensitivity of detecting F3/F4 while having little effect on detection of just F4. Studies have shown that US Sn and Sp are of the lowest when it comes to radiologic evaluation of cirrhosis, 52.4% and 73.5%, respectively. We improved on these values and with the addition of APRI scores to 76.7% and 90%. Further investigation is needed to try and determine a completely non-invasive way of assessing for cirrhosis.

Background

* Extent of liver cirrhosis is important in its management.
* There is limited non-invasive methods of diagnosis cirrhosis and currently liver biopsy is gold standard.

* Ultrasound, CT and MRI scans have various sensitivities in diagnosing liver cirrhosis ranging from 52-86%.

Discussion

* Currently the gold standard of diagnosis liver fibrosis is a liver biopsy.
* Our research aimed at determining a method that was less invasive.
* At our tertiary center ultrasound with APRI scores had a sensitive and specificity of 76.2% and 90% when the cutoff was a Metavir score of F3/F4.

Conclusion

* Addition of APRI scores to ultrasounds of livers increased the sensitivity.
* Further investigations into CT and MRI evaluations with APRI scores, as these are already known that have higher sensitivities and specificities, should be performed.
* Also, having radiologists re-evaluate the images knowing the APRI and seeing if this impacts the results.

References