ABSTRACT

**TITLE:** Diagnostic accuracy of Acoustic Radiation Force Impulse (ARFI) Elastography of liver in patients with Thalassemia for the detection and staging of liver fibrosis in comparison to liver biopsy in Thalassemia patients prior to Bone Marrow Transplantation

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**OBJECTIVES:**

1) To assess the diagnostic accuracy of ARFI imaging of liver to detect liver fibrosis in patients with Thalassemia who are planned for Bone marrow transplantation

2) To compare the values of shear velocities on ARFI scan of liver with that of fibrosis on liver biopsy in the same group of patients and determine the best cut offs for detecting various grades of liver fibrosis.

3) To compare the serum Ferritin levels of these patients with that of the mean ARFI values of liver and find out any correlation between the two.
METHODS:

Prospective study approved by the Institutional Review Board of the Institution with financial grant for the same. Total of 54 patients were studied between the age group of 2 to 20 years. The ARFI liver scans were done prior to the liver biopsy and the shear wave velocity measurements were recorded as m/sec. The cut off values for F1, F2, F3 and F4 were kept as 1.18 m/sec, 1.21 m/sec, 1.54 m/sec and 1.94 m/sec respectively. The grades of fibrosis were coded from F1-F4.

Serum Ferritin levels done around the same time period were taken into account for the analysis.

Subsequently, the patients underwent liver biopsy; the samples of which were also studied and grades of fibrosis were given from F1-F6 based on the popular Ishak grading system for liver fibrosis assessment.

RESULTS:

54 Thalassemia patients (37 male and 17 females) with a median age of 8.1 years (range 2-20 years) were studied. All 54 cases underwent liver biopsy. There was one insufficient liver biopsy sample hence this patient was not included in the statistical analysis. Keeping the cut offs of ≥ 1.18 m/sec, ≥ 1.21 m/sec, ≥ 1.54 m/sec and 1.94 m/sec on ARFI for F1, F2, F3 and F4 grades of fibrosis, the sensitivity and PPV of ARFI to detect the corresponding grades of fibrosis on liver biopsy was 89 % and 89% with a diagnostic accuracy of 81%; while the specificity and NPV value were 29% and 29% respectively. There was only 18% agreement between ARFI liver and fibrosis on liver biopsy which was not statistically significant (p = 0.942).
There was moderate correlation between the serum Ferritin values and the ARFI grades of fibrosis; however it did not show any linear increase in values. About 84.3 % of patients with serum ferritin values of >1000 ng / ml were distributed within the F2, F3 fibrosis grades of ARFI.