



# Assessment of liver imaging in a diabetic population with an abnormal AST-to-platelet-ratio-index (APRI) or Fibrosis-4-score (FIB4)

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## Introduction

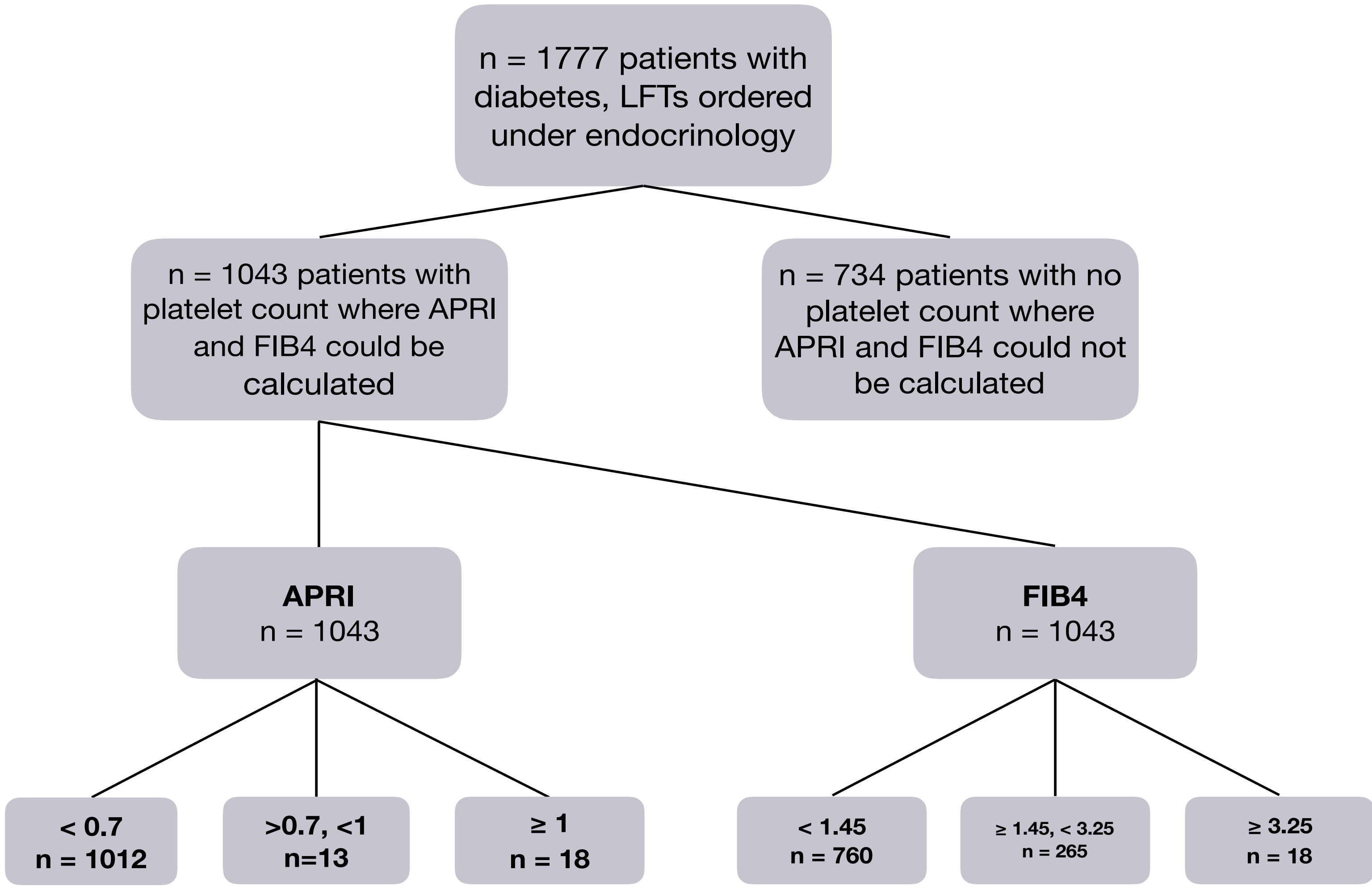
The prevalence of abnormal liver function tests (LFTs) in the general population has been estimated to be 8.9—9.1%.<sup>1</sup> We examined the prevalence of abnormal LFTs in the diabetic population attending our tertiary referral centre and found the rate to be 33.8%<sup>2</sup> as defined by the American College of Gastroenterologists<sup>3</sup> in the 1777 patients who attended our service in 2016. ALT was then most commonly elevated liver enzyme. We also calculated the APRI and FIB4 scores for these patients where possible. APRI and FIB4 scores can be used to estimate degree of liver fibrosis. In a meta analysis of 40 studies, investigators concluded that an APRI score >1 has 76% sensitivity, 72% specificity for predicting cirrhosis. APRI score >0.7 has 77% sensitivity, 72% specificity for predicting significant fibrosis.<sup>4</sup> A FIB4 score > 3.25 has 97% specificity and 65% positive predictive value for advanced fibrosis.<sup>5</sup> However these have not been validated in a diabetic population.

## Aim

This retrospective study aimed to examine the liver imaging performed in diabetic patients with abnormal APRI and FIB4 scores. We aimed to examine if the rate of advanced fibrosis in the diabetic population correlated with the sensitivity and positive predictive value that these scores have been proven to have in the normal population. No comment could be made on cirrhosis as this is a histological rather than a radiological diagnosis.

## Method

Electronic records were used to conduct this retrospective study. Every patient with a diagnosis of type 1 or type 2 diabetes who had LFTs measured under the care of an endocrinology consultant in St James's Hospital in 2016 was eligible for inclusion. The rate of abnormal LFTs in our diabetic population as defined by the American College of Gastroenterologists was originally determined and APRI and FIB4 scores calculated where possible. APRI was calculated for each patient using the formula  $[(AST / ULN\ AST) \times 100 / Platelets (109/L)]$ . FIB4 score was calculated using the formula  $[(Age \times AST) / (Platelets(109/L) \times \sqrt{ALT})]$ . It was only possible to calculate both of these scores where a value for platelets was available on the electronic record. For patients who had an abnormal APRI or FIB4 score we then reexamined their electronic records to see if they had any liver imaging performed within 1 year of the bloods from which the APRI and FIB4 scores were calculated. We then calculated the percentage of patients with advanced liver fibrosis in those who had liver imaging available.



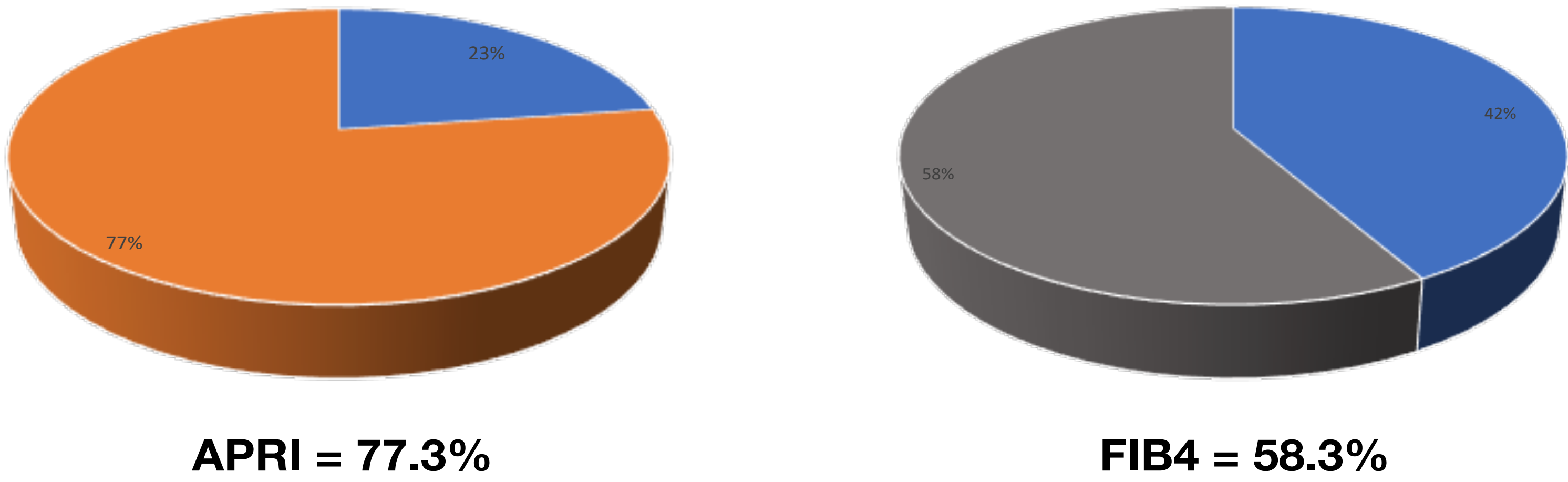
## Results

We found that 600 of 1777 (33.8%) had at least one abnormal LFT. ALT was the most commonly elevated liver enzyme with 410 (23.1%) patients having an abnormal result. 734 (41.3%) patients who attended had no platelet counts performed as part of their assessment and so APRI or FIB4 could not be calculated. Both of these scores were calculated for the remaining 1043 (58.69%) patients. 265 (25.41%) of these had FIB4 scores  $\geq 1.45$  but less than 3.25 and 18 (1.73%) had scores  $\geq 3.25$ . Median = 1.086, range = 0.187—14.534. Of these 18 patients, 12 had recent liver imaging. 4 (33%) were reported normal, 1 (8.3%) showed metastases and 7 (58.3%) showed advanced fibrosis. 31 patients (2.97%) had an APRI score of >0.7 while 18 (1.73%) of these patients had an APRI score of  $\geq 1$ . Median = 0.219, range = 0.051—13.45. Of these 31, 22 had recent liver imaging performed. 3 (13.6%) of these were reported normal, 2 (9.1%) as mild fatty change and 17 (77.3%) as advanced fibrotic change.

Score	No. Calculated	No. Raised	No. With Imaging Available	No. Advanced Fibrosis on Imaging
APRI	1043	31 (>0.7) (2.97%)	22	17
FIB4	1043	18 ( $\geq 3.25$ ) (1.73%)	12	7

Table 1. Table showing no of APRI and FIB4 calculated with no. raised and no. with imaging

Fig 2. % of patients with raised scores with liver imaging showing advanced fibrosis



## Conclusion/ Discussion

Our study shows APRI may have a role in screening diabetic patients for advanced liver disease, with 77.3% of patients with liver imaging performed and an abnormal APRI score having advanced fibrosis. Of the patients with FIB4 scores  $\geq 3.25$  only 58.3% of those who had imaging available had advanced fibrosis. As only 12 had imaging performed, a larger sample study may improve the accuracy of this figure. Liver biopsies would need to be performed to determine the rates of cirrhosis in each group. While these scores are indicators of advanced liver disease, it is important to note that they do not point to the aetiology and so they should be correlated with a full clinical history and exam including a thorough alcohol history. For the 734 patients where APRI and FIB4 could not be calculated, this was due to a platelet count being unavailable and so a full blood count would be required to be added to routine diabetic bloods to utilise these scores.

## References

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