



# Body mass index–based controlled attenuation parameter cut-offs for assessment of hepatic steatosis in non-alcoholic fatty liver disease

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## Abstract

**Background and Aim** In patients with liver disease, etiology and body mass index (BMI) affects controlled attenuation parameter (CAP) assessment using FibroScan. We aimed to assess the performance characteristics of CAP for hepatic steatosis in patients with non-alcoholic fatty liver disease (NAFLD) stratified into obese (BMI  $\geq 30$  kg/m<sup>2</sup>) and non-obese (BMI  $< 30$  kg/m<sup>2</sup>) subgroups.

**Methods** In this prospective study, 219 consecutive adult NAFLD patients, with an available FibroScan value (liver stiffness measurement—[LSM] and CAP) and liver biopsy, were included. Receiver operating characteristic curves were used for assessment of the CAP cut-off values predicting different stages of hepatic steatosis.

**Results** The mean  $\pm$  standard deviation age of patients was  $39.7 \pm 10.5$  years, 116 (53%) were males, and median (interquartile range) BMI was  $31.8$  (25.7–43.8) kg/m<sup>2</sup>. One hundred (45.7%) and 119 (54.3%) patients were non-obese and obese, respectively. The median values of CAP and LSM were significantly higher among obese patients as compared with the non-obese ones: 333 (304–368) vs. 320 (296–345) dB/m,  $p = 0.002$  and  $8.3$  (6.1–11.4) vs.  $6.6$  (5.7–10.3) kPa,  $p = 0.012$ , respectively. Among non-obese NAFLD, optimal CAP cut-off values for steatosis (S)  $\geq$  S1,  $\geq$  S2, and  $\geq$  S3 were 275 dB/m, 319 dB/m, and 337 dB/m, respectively. The corresponding CAP values among obese patients were higher as 285 dB/m, 340 dB/m, and 355 dB/m, respectively. BMI independently predicted CAP on multivariate analysis. The discordance of 2-grades between CAP and biopsy measured steatosis was seen in 13% in non-obese and 19.3% in obese NAFLD. CAP overestimated steatosis more often than underestimating it, with a higher proportion in obese NAFLD.

**Conclusion** In patients with NAFLD, interpretation of CAP requires consideration of BMI.

**Keywords** Fat · FibroScan · Liver biopsy · Liver stiffness measurement · Obesity

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