



Development of US- and CT/MRI-based quantification of liver steatosis

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The prevalence of nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH) has increased rapidly worldwide, along with increases in the prevalence of obesity and type 2 diabetes mellitus [1]. Thus, to say that this is the “era of obesity” is not an understatement. Although drug treatments for NAFLD/NASH have not been developed yet, some promising treatments will be introduced in the near future. If introduced, assessment of liver steatosis may be more imperative for clinicians not only for detection of patients with steatosis, but also to assess treatment response.

For decades, liver biopsy has been considered the reference standard for quantifying liver steatosis. At histology, the amount of fat in the liver is graded as: S0, steatosis in less than 5% of hepatocytes; S1, 5–33%; S2, 34–66%; and S3, more than 66% [2]. Besides being invasive and not free of risk, liver biopsy is impractical for assessing liver fat content in the large number of NAFLD patients who may have simple steatosis, which is the majority of cases. On the other hand, liver steatosis is a dynamic process that may change in a short period of time, necessitating a noninvasive technique that can be repeated multiple times to accurately assess progression or regression of disease. Thus, the development of noninvasive imaging tests for liver steatosis is mandatory.

This special feature reports the utility of quantifying liver fat content in NAFLD/NASH and analyzes the literature on the currently available noninvasive and also invasive methods (liver biopsy) for fat quantification, giving guidance on their use either in clinical settings or in research studies. New ultrasound (US) methods utilizing the nature of attenuation that are able to quantitatively assess liver fat content have been recently developed by the different manufacturers: Dr. Dong Ho Lee describes the utility of “attenuation imaging” (ATI™: Canon Medical Systems, Tochigi, Japan),

Dr. Hidekatsu Kuroda describes the utility of “US-guided attenuation parameter” (UGAP™: GE Healthcare, Milwaukee, USA), Dr. Nobuharu Tamaki describes the utility of “attenuation coefficient” (ATT™: Hitachi Medical, Tokyo, Japan), and Dr. Giovanna Ferraioli describes the utility of controlled attenuation parameter (CAP™: Echosens, Paris, France). Dr. Eriko Yoshizawa describes the assessment of liver fat with magnetic resonance, which is currently the accepted reference standard. Also, Dr. Akira Yamada describes the utility of dual energy CT. Finally, Dr. Reichi Kondo describes the utility of pathological findings as the reference standard for liver steatosis. These review articles are based on the knowledge of the literature of the experts who selected articles that they felt had the highest quality. Thus, I believe that this special feature provides readers of the Journal of Medical Ultrasonics with very interesting and informative knowledge.

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