The Future Regarding Non-Alcoholic Fatty Liver Disease Diagnosis: Could Artificial Intelligence Replace Liver Biopsy?

Sir,

Non-alcoholic fatty liver disease (NAFLD), an unsurpassable prevalent hepatic illness, affects 25% of the world's inhabitants, with 33.9% of Asians, affected from 2012 to 2017. The former is projected to increase to 30% in 2030.[1] Benign non-alcoholic fatty liver (NAFL) and dreadful non-alcoholic steatohepatitis (NASH) are included under the category of NAFLD.[1] The most distinctive manifestation of NAFLD is hepatocellular steatosis, which typically starts in zone 3 (perivenular), and it must be present in >5% of hepatocytes to be diagnosed as NAFLD.[2] NASH is becoming the second most common and fastest-growing liver transplant indication in the United States.[2] Diagnosing NAFLD accurately is a significant challenge. Currently available tests include routine investigations using serum biomarkers such as the fatty liver index (FLI), hepatic steatosis index (HSI), SSteatoTes, and NAFL screening score, followed by imaging methods such as ultrasound, CT, and MR-based techniques.[3-6] Ultrasound is still the primary diagnostic tool for hepatosteatosis (>33% of hepatocytes contain steatosis) but is less reliable for mild steatosis (<33% steatosis), whereas, pathological assessment of liver biopsy remains the most reliable test for NAFLD detection.[1,2] However, liver biopsy has limitations such as puncture risk (haemoperitoneum and haemothorax), financial burden, and diagnostic heterogeneity, making it unsuitable for routine screening. Therefore, there are significant application opportunities for non-invasive diagnostic techniques for the early detection of NAFLD.

In recent years, artificial intelligence (AI) has advanced in several areas of medicine, enabling image identification, non-invasive diagnosis, and treatment decision-making.[3] AI is promising to facilitate clinical NAFLD diagnosis by identifying at-risk populations and helping understand the pathophysiology of NAFLD.[2] Research studies indicate that integrating imaging, clinical data, and machine learning (ML) techniques can effectively predict the development of liver fibrosis. A novel Clinical Decision Support System (CDSS) for identifying NASH was proposed by Douali *et al*. in 2013. The accuracy rate of this study in detecting NAFLD was 91.7%.[3] Fialoke *et al*. employed Optum Analytics, one of the largest US electronic medical records (EMR), which included more than 80 million sufferers, to apply robotic intelligence for the prediction of NASH among NAFLD victims. In this cohort, 45,797 sufferers had NASH (62.6%), while 27,393 were declared well.[4] NASHMap, a Novartis pharma product successfully identified 879,269 additional NASH cases that were missed by Optum's EMR in 2019.[5] In 2020, Schawkat *et al.* successfully evaluated the diagnostic authenticity of hepatic fibrosis utilising MR elastography and robotic intelligence on T1w and T2w-phase imagery based on texture analysis (TA).[6]

Extensive research has been conducted on the potential of AI for the pathological diagnosis of NAFLD, yielding promising results. AI seems promising for detecting patients with NASH and progressive fibrosis by neutrally evaluating hepatic imagery and addressing inadequacies contained in liver histologic research.[3] AI will be integrated into medical settings to assist in managing and scrutinising liver-related illnesses. However, before applying AI in a clinical setting, a number of challenges must be handled, including creating precise diagnostic tools, carrying out extensive confirmatory research, guaranteeing equipment accessibility, and training personnel.[2]

In summary, in order to enhance its development, AI needs the active participation of medical organisations, businesses, medical professionals, and other stakeholders.

COMPETING INTEREST:
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