

# The role of point-of-care ultrasound in the assessment of schistosomiasis-induced liver fibrosis: a systematic scoping review

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**Background.** Abdominal ultrasound imaging is an important method of hepatic schistosomiasis diagnosis and staging. Several ultrasound staging systems have been proposed, all attempting to standardise periportal fibrosis (PPF) diagnosis. This review aims to establish the role of ultrasound in the diagnosis and staging of PPF, and to map the evolution of ultrasound staging systems over time, focusing on validation and reproducibility.

**Methods.** A systematic search was undertaken on 21/12/2022 (protocol registered at <https://osf.io/jrcmn>), considering multiple databases with no restriction on publication date. Case reports, systematic reviews and meta-analyses, and studies exclusively using elastography or Doppler imaging were excluded. Variables relevant to the aims of the review were extracted from included studies, for example the staging system, ultrasound technology used and validation methods. The PRISMA-ScR guidelines were followed to inform the structure of the review.

**Results.** 223 studies were eligible for extraction: the initial search yielded 575 unique articles, 169 of which were screened out with titles and abstracts, and 183 of which were excluded at full-text screening. Most studies were conducted after the year 2000 and were located in Brazil, Egypt and Sudan. The staging systems used in the studies took on three forms: feature-based, measurement-based and image pattern-based. The Niamey protocol, a measurement and image pattern-based system, was the most used among the staging systems, despite being the most recently proposed (1996). Of the studies using the Niamey protocol, most only used the image patterns element. Where ultrasound technology was specified, studies conducted before 2000 overwhelmingly used linear array transducers, with studies after 2000 more likely to use convex transducers. Few studies detailed their methods of validation or referenced reproducibility of the staging system that was used.

**Conclusions.** The exclusive use of the image patterns in many studies, the increasing number of studies involving ultrasound staging of PPF over time, and the movement in ultrasound technology used since 2000 all indicate a need for an update to the Niamey protocol.