

Noninvasive assessment of liver function in adults with congenital heart disease (ACHD) by transient elastography (Fibroscan), Acoustic Radiation Force Impulse Imaging (ARFI) and biochemical markers

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Objectives: ACHD may have hemodynamic features, which cause liver congestion, fibrosis or cirrhosis. This study aimed to assess in ACHD the impact of ultrasound based procedures (USBP) (i.e.: Fibroscan, ARFI), and specific biochemical markers on noninvasive staging of liver fibrosis/cirrhosis (LF/LC).

Methods: Patients after atrial switch operation (ASO), after Fontan-Operation or with Eisenmenger syndrome (ES) were studied prospectively in 2 tertiary care centres (Munich, Berlin) to assess hepatic damage noninvasively using clinical data, Fibroscan, ARFI, and abdominal sonography. Blood samples were taken for detailed laboratory analysis, including conventional liver tests (the aspartate aminotransferase(AST)-to-platelet ratio index (APRI), the FIB-4 test and biochemical fibrosis markers, such as hyaluronic acid.

Results: 50 adults (27 after ASO, 10 after Fontan procedure, 13 ES; median age 33,5 years; 18 female) were enrolled. As a result, 16 patients (8 ASO, 8 Fontan) showed signs of hepatic damage in USBP, while laboratory data were altered in > 50% of all enrolled cases. Interestingly, 13 of 16 patients with increased hepatic stiffness in the USBP had normal biochemical markers of LF/LC. Overall, regarding imaging and laboratory analysis, 62% (31/50) patients had signs of liver pathology. According to USBP, 34% (17/50) seem to have LF, and 28% (14/50) are suspect to have LC (thereof most with Fontan hemodynamics).

Conclusions: Adults after ASO, Fontan-Operation or with ES are prone to develop liver congestion, fibrosis and cirrhosis. Noninvasive USBP, such as Fibroscan and ARFI, are useful noninvasive methods for early detection of liver stiffness in ACHD. Biochemical fibrosis markers were not indicative for LF/LC in these patients.

For targeted screening of hepatic involvement in CHD, it seems to be crucial that not a single analysis, but several complementary methods, such as ARFI, Fibroscan, abdominal sonography and liver serotests, are performed. Only combined consideration of such noninvasive procedures lead to a meaningful diagnosis of hepatic damage. As special expert knowledge is essential, patients should be transferred for diagnosis to centres of excellence, where congenital cardiologists and hepatologists cooperate.