

Does the calculation of the „DI-RISK“ (Difference of Resistive Indices in Spleen and Kidney) allow to specifically diagnose renovascular disease?

Background

Duplex sonography is an established, non-invasive method for diagnosis of renal artery stenosis. Several extra- and intrarenal criteria of stenosis have been defined in duplex sonography. Extrarenal criteria cannot always be reliably applied due to technical difficulties, intrarenal parameters show insufficient sensitivity and specificity in many studies.

The aim of this study was to inspect the hypothesis if a new intrarenal sonographic marker, defined as the Difference (Δ) of the Resistive Indices (RI) in Spleen and Kidney („DI-RISK“), would be superior to conventional sonographic parameters for diagnosis of haemodynamically significant renovascular disease.

Materials and Methods

In 248 patients at elevated cardiovascular risk, the presence of renal artery stenosis was studied by duplex sonography. The results were compared to renal artery angiography performed during a coronary angiography examination. The degree of angiographic renal artery stenosis was measured by CAAS II System software programme. A 50 - 69% diameter stenosis was defined as „moderate“, a $\geq 70\%$ stenosis as „severe“.

In duplex sonography, an established intrarenal parameter for detection of renal artery stenosis, namely

Δ RI reno-renal (RI affected kidney - RI contralateral kidney) < -5 , was compared to the new marker

DI-RISK (RI affected kidney - RI spleen) < 0 .

Results

16 patients (6%) angiographically showed unilateral renal artery stenosis, among whom four patients had stenosis of accessory renal arteries. There was no patient with a bilateral renovascular disease. 13 patients suffered from a moderate stenosis, three patients from a severe narrowing of the luminal diameter. Compared to angiography, the DI-RISK had a sensitivity of 27% and a specificity of 95%, whereas Δ RI reno-renal reached a sensitivity of 44% and specificity of 96%.

Conclusion

The results of this study show that the DI-RISK cannot be used for the detection of moderate renal artery stenosis. As there were too few patients with severe stenosis in the cohort, it remains unproven to what extent the DI-RISK might allow to detect severe and hemodynamically relevant renal artery stenosis.