Nature Reviews Urology | Published online 20 Jun 2017; doi:10.1038/nrurol.2017.101

KIDNEY CANCER

FBV INDICATES SUNITINIB RESPONSE

Targeted anti-angiogenic agents, such as sunitinib, have substantially improved the outcomes of patients with renal cell carcinoma (RCC); however, intrinsic and acquired resistance are both common and biomarkers that predict treatment sensitivity are currently lacking. Now, researchers have investigated susceptibility contrast MRI using intravascular ultrasmall superparamagnetic iron oxide particles to evaluate fractional blood volume (fBV) as a novel biomarker.

Using a mouse model of RCC generated by xenograft of human RCC cells, researchers demonstrated a significant (71%) reduction in fBV following treatment with sunitinib for 2 weeks ($P<0.01$) with a significant reduction in microvessel density ($P<0.01$). Furthermore, an inverse correlation was observed between pretreatment fBV and sunitnib-induced alterations in fBV, whereby highly vascularized tumours had a more dramatic response to treatment. These changes occurred prior to any notable alterations in tumour volume. Intriguingly, tumours with acquired resistance to sunitinib did not develop new blood vessels following an initial response to sunitinib, suggesting that revascularization is not involved in acquired resistance in this model. No adverse effects were reported in mice exposed to the particles used in these experiments, suggesting that this approach might be feasible in human patients.

In conclusion, these findings suggest that imaging tumour blood flow provides valuable information on the likelihood of a response to sunitinib, and possibly other anti-angiogenic agents, in patients receiving such treatments for RCC.

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ORIGINAL ARTICLE Robinson, S. P. *et al.* Monitoring the vascular response and resistance to sunitinib in renal cell carcinoma in vivo with susceptibility contrast MRI. *Cancer Res.* http://dx.doi.org/10.1158/0008-5472.CAN-17-0248 (2017)