

IMMUNOLOGY

PD-1 and PD-L1 prognostic in UTUC

Expression of programmed cell death protein 1 (PD-1) and programmed death ligand 1 (PD-L1) has prognostic value in patients with high-grade upper tract urothelial carcinoma (UTUC), according to new data published in *The Journal of Urology*.

Samples from 423 patients receiving extirpative surgery for high-grade UTUC were analysed immunohistochemically for PD-1 and PD-L1 expression, with positive staining being regarded as $\geq 1\%$ of tumour-infiltrating cells (for PD-1) and tumour cells (for PD-L1).

Positive expression for PD-1 was observed in 37.1% of patients and 26.2% were positive for PD-L1 expression. Positive expression of PD-1 was significantly associated with adverse pathological characteristics, including lymphovascular invasion and concomitant carcinoma *in situ* (both $P < 0.001$). On univariate analysis, positive PD-1 expression was significantly associated with worse recurrence-free survival (RFS, $P = 0.006$), cancer-specific survival

(CSS, $P = 0.007$), and overall survival (OS, $P = 0.008$); however, only CSS and OS remained significant on multivariate analysis ($P = 0.039$ and 0.029 , respectively).

For PD-L1 expression, positivity was only significantly associated with favourable pT stage ($P = 0.049$), and not with survival outcomes on multivariate analysis. However, multivariate analysis showed that positive expression of PD-L1 was an independent prognostic factor for RFS and OS in patients with organ-confined disease ($P = 0.046$ and 0.003 , respectively).

These data show that protein expression of PD-1 and PD-L1 can be used to risk stratify patients with high-grade UTUC, which could have implications for the management of patients with this disease.

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