A systematic review and meta-analysis of immunohistochemical biomarkers that differentiate chromophobe renal cell carcinoma from renal oncocytoma

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Abstract
Background Numerous immunohistochemical (IHC) biomarkers have been employed to aid in the difficult differentiation between chromophobe renal cell carcinoma (CRCC) and renal oncocytoma (RO). A systematic review and meta-analysis of the published literature was carried out to summarize and analyze the evidence for discriminatory IHC biomarkers to differentially diagnose the two entities.

Methods PubMed database was used to identify relevant biomarkers. Primary and pooled forest plots were compared for their predictive immunoreactivities of the biomarkers in CRCC and RO. The overall accuracy for each biomarker was calculated using the area under the curve (AUC) and the statistics for heterogeneity were assessed using the Q statistic and I².

Results One hundred and twelve manuscripts were available for review. Data extracted were subjected to quantitative meta-analysis. The most effective biomarkers (S11 of 110) were: ANPEP (OR = 0.57, 95% CI 0.38 to 0.85), CEA (OR = 0.38, 95% CI 0.28 to 0.52) and CA7 (OR = 0.29, 95% CI 0.18 to 0.48), with the mean number of positive results being greater than 50% in both CRCC and RO.

Conclusions We recommend a panel of IHC biomarkers at an average of 5A. ANPEP, CEA and CA7 to aid in the differentiation of CRCC and RO.