Tumour Markers and Kidney Function: A Systematic Review

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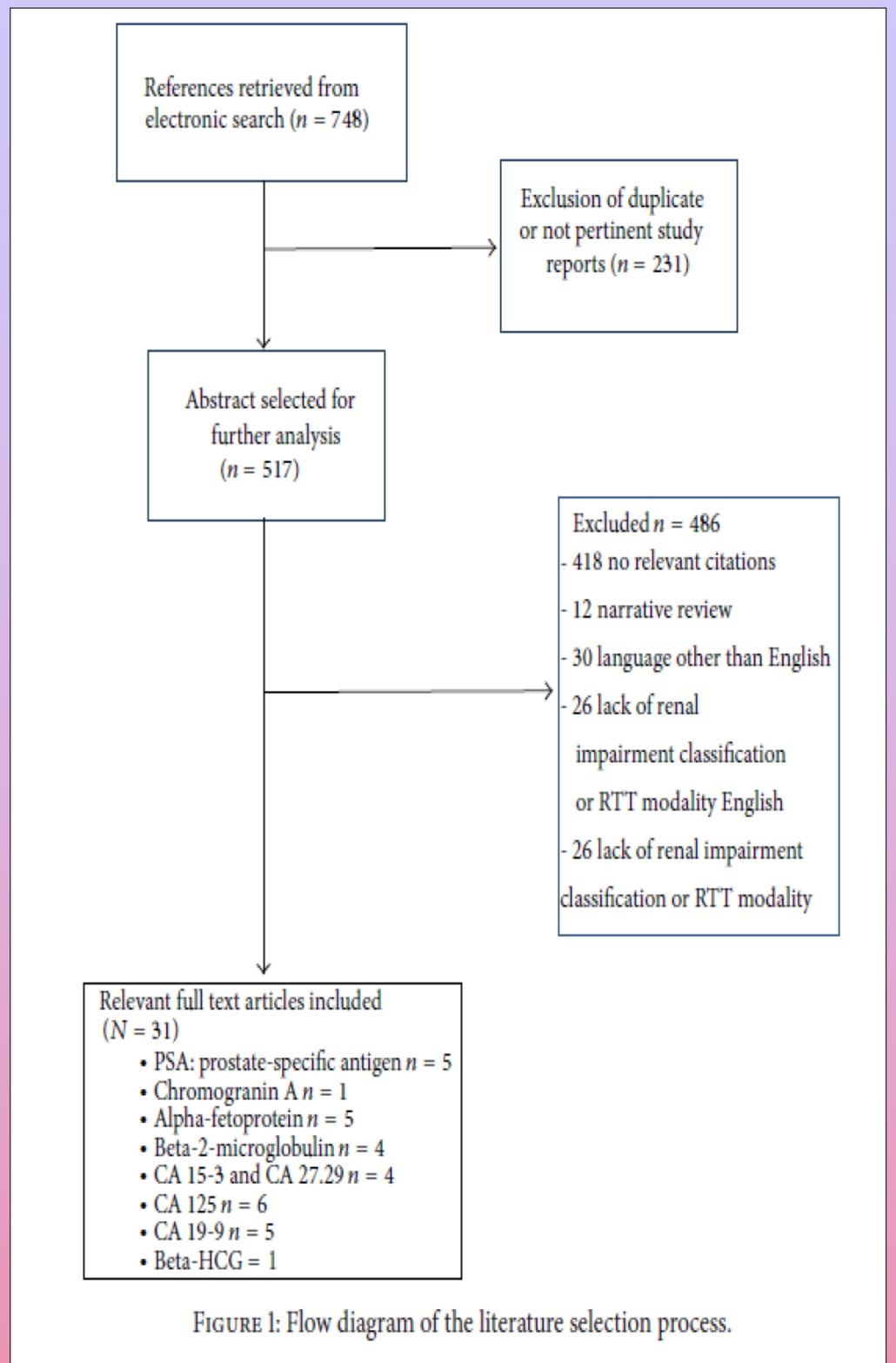

FIGURE 1: Flow diagram of the literature selection process.

INTRODUCTION AND AIMS

Tumour markers represent useful tools in diagnosis and clinical management of patients with cancer, because they are minimally invasive and easily measured in either blood or urine.
Different pathological states may increase the level of a tumour marker in the absence of any neoplasia (false positive), while, in other cases, not every subject with cancer has abnormally high levels of the tumour marker usually associated with that neoplasia (false negative).
We aimed at reviewing studies currently available in the literature examining the association between tumour markers and different renal impairment conditions.

METHODS

Studies that examined the association between tumour markers and renal impairment stages were identified by a computerized research of all English-language articles in the electronic database PubMed. We conducted a systematic search of full text papers, published between 1990 and December 2012, by combining the following Medical Subject Heading (MeSH) terms: "tumour marker" or "neoplastic marker" or the name of single neoplastic marker combined with "renal disease" or "chronic kidney disease" or "renal failure" or "haemodialysis" or "peritoneal dialysis" or "renal transplant". We considered all types of clinical studies, including parallel nonrandomized, randomized, and crossover trials, observational studies, and meta-analyses. **Figure 1** depicts a flow chart of the selection process.

RESULTS

Seven hundred forty-eight references were initially retrieved; two hundred thirty-one studies were excluded because they were duplicates or not pertinent with our topic. Four hundred eighteen references were discharged after full text analysis considered them to be not relevant, 12 being narrative reviews without new data to be considered, 30 being in languages different from English, and 26 having no data available on renal impairment or RTT modality. Thirty-one full text articles were therefore included in the final analysis. **Table 1** resumes the main variations of tumor markers levels under different renal impairment conditions.

TABLE 1: Summary of main variations of tumor markers levels in CKD, dialysis, and kidney transplantation.

	CKD	Hemodialysis	Peritoneal dialysis	Kidney transplantation
Alpha-fetoprotein (AFP)	=	=	=	=
Beta-2-microglobulin (B2M)	↑	↑	↑	↑
Beta-HCG	↑	↑	—	—
CA 15-3 and CA 27.29	↑	↑*; =*	—	=
CA 125	=	=	↑ In case of peritonitis or PD catheter placement	=
CA 19-9	=*; ↑*	—	—	—
Total tPSA	=	↓	=	—
Free fPSA	↑	↑	—	—
Chromogranin A	↑	↑	—	↑

=: Unvaried with respect to patients with normal renal function; ↑: increased; ↓: decreased; —: no sufficient data; *see text.

CONCLUSIONS

Tumor markers, commonly used to assist in making a diagnosis and determining a prognosis, may result, in certain conditions, as false negatives or false positives. In our literature review we focused on the influence of different levels of altered renal function or on cases of renal replacement therapy (haemodialysis or peritoneal dialysis) or kidney transplant. Each tumour marker may be differently influenced by these conditions; importantly we revealed a lack of conclusive published data for some of these markers.

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