SERUM CYSTATIN C COMPARED TO GLOMERULAR FILTRATION RATE IN CANCER PATIENTS RECEIVING PLATINUM-BASED CHEMOTHERAPY

V. BARCHIESI, S. CECERE, D. CERASUOLO, M. DI MAIO, F. DI PAOLA, S. PIGNATA, E. CAVALCANTI

Istituto Nazionale Tumori – IRCCS, Fondazione G. Pascale, Napoli, Italy

BACKGROUND

Cystatin C, a cysteine protease inhibitor, is freely filtered by the glomerulus, and almost completely reabsorbed and metabolized in the proximal tubule without secretion. It does not suffer interference of sex, race, height or muscle mass unlike creatinine so it has been proposed as a marker of kidney function.

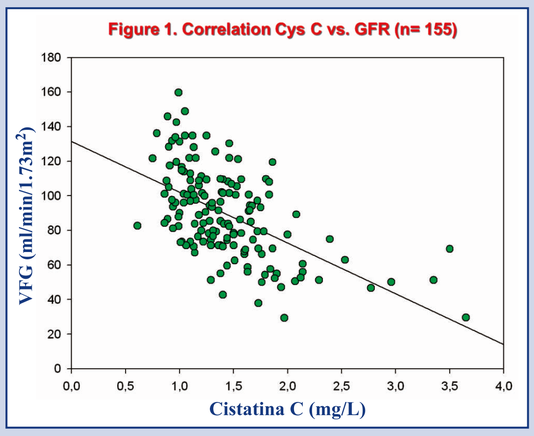
AIMS

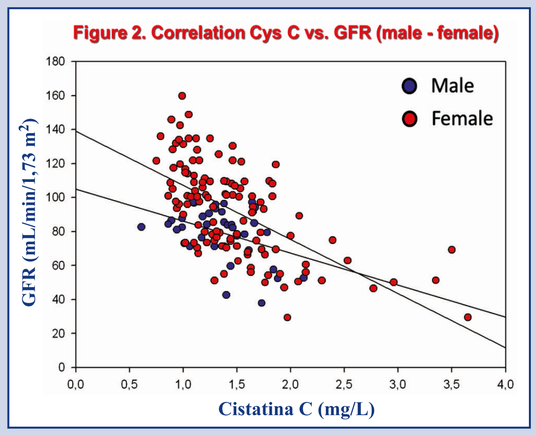
Our aim was to evaluate the diagnostic accuracy of Cystatin C in predicting a reduction in glomerular filtration rate (GFR) in cancer patients, admitted to the Istituto Nazionale Tumori, receiving platinum-based chemotherapy.

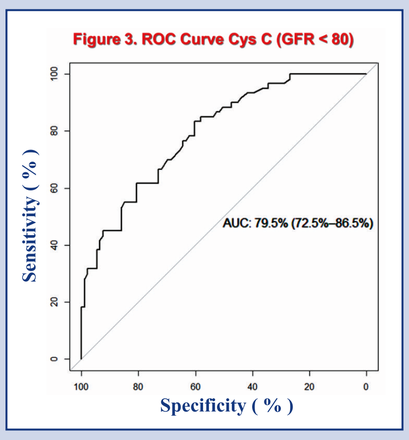
METHODS

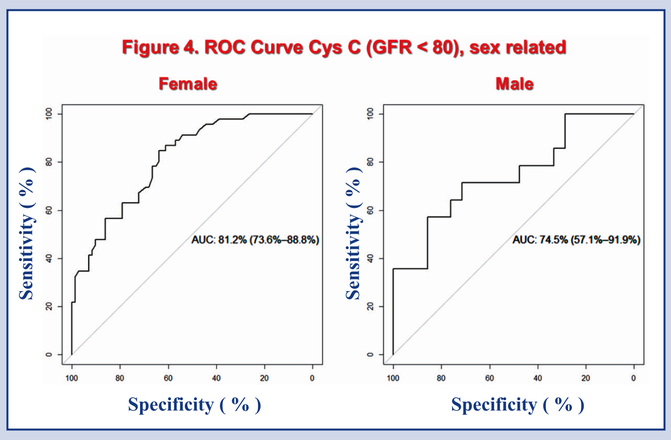
31 patients were studied: 7 males, 24 females; 18 carboplatin-based, 13 cisplatin-based chemotherapy. **Serum Creatinine** (enzymatic, on Cobas C6000 Roche), **Serum Cystatin C** (immunoenzymatic, on AIA 360 Tosoh), **GFR** (CocKcroft Gault equation) were determined simultaneously in all patients, before the first cycle of CT and before the subsequent administration. Pearson correlation coefficients (r) were calculated. To asses the diagnostic accuracy of serum Cys C in predicting a diminuition of the GFR, ROC plots were performed (pROC package for R), calculating the area under the curve (AUC) and 95% confidence interval (CI).

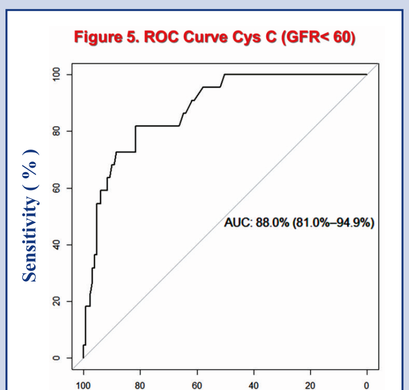
RESULTS

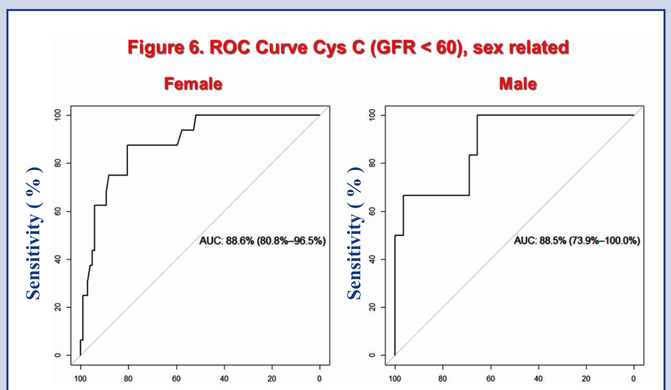












Overall, 155 measurements were performed. Median baseline Cys C value was 1,39 mg/L (range 0,75 – 1,94). Median baseline GFR was 87,8 mL/min/1,73 $m^{2.}$ Out of 31 patients, 14 had a baseline GFR < 80: all patients had a baseline Cys C > upper normal limit, whilst serum creatinine value was within normal range in 13 (93%). Of patients starting treatment with baseline normal GFR, 2 patients subsequently developed GFR < 80, both with high baseline Cys C and normal creatine value. In the overall series, linear regression showed a significant relationship ($p<0,001$) between GFR and concomitant value of serum Cys C (r=o.56) (Fig. 1). The raltionship was statistically significant in both males and females, but was higher in females (0,62 vs 0,43 in males) (Fig.2). For GFR<80, the AUC of ROC curve for Cys C was 79,5% (95% CI 72,6%-86,5%) (Fig. 3-4).
For GFR<60 the AUC of ROC curve for Cys C was 88,0% (95% CI 81,0% - 94,9%) (Fig. 5-6).

	GFR < 80	GFR < 60
Best Treshold	1.285 mg/L	1.62 mg/L
Sensitivity	83.3%	81.8%
Specificity	60.2%	81.7%
NPV	84.8%	96.4%
PPV	57.5%	42.9%

DISCUSSION

Cystatin C represents a more sensitive marker then serum creatinine, mainly to detect slight renal alteration, becoming a promising alternative that could reduce hidden renal insufficiency, although more studies are needed to confirm.