

CALCULATED SERUM OSMOLALITY IN PERITONEAL DIALYSIS PATIENTS IS ASSOCIATED TO PERITONEAL CLEARANCE, TRANSPORT TYPE AND FLUID REMOVAL

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Introduction and Aims:

Endstage renal disease is resulting in a hyper-osmotic status due to the accumulation of osmotically active substances. The aim of the study was to evaluate the associations between calculated osmolality, peritoneal clearance, peritoneal transport type and fluid removal.

Methods:

Serum osmolality was calculated from sodium, glucose and urea (osmolality = sodium * 1.86 + glucose / 18 + blood urea nitrogen / 2.8 + 9, osmolality in mOsm/kg, sodium in mEq/l, glucose in mg/dl and blood urea nitrogen in mg/dl) in 71 adult peritoneal dialysis patients (age: mean±SD 63±15 years) during 196 peritoneal equilibration and clearance tests (median two tests per patient). Daily fluid removal represented the sum of peritoneal ultrafiltration and urine output. The relation between osmolality, peritoneal transport type (D/P creatinine), peritoneal clearance (Kt/V and creatinine clearance) and daily fluid removal was analysed.

Results:

Calculated serum osmolality was in the range of 272 to 329 mOsm/kg (mean SD 301 9 mOsm/kg). Four cases presented calculated osmolality values below 280 mOsm/kg; 81 cases were in the range between 280 and 300 mOsm/kg; whereas the majority of cases (n=111) had values above 300 mOsm/kg. As expected, there is a significant negative correlation between calculated osmolality and peritoneal clearances (osmolality versus peritoneal Kt/V: $r = -0.32$, $p < 0.001$; osmolality versus peritoneal creatinine clearance: $r = -0.38$, $p < 0.001$). Faster peritoneal transport type was associated to lower calculated osmolality (D/P creatinine versus osmolality: $r = -0.29$, $p < 0.001$) and lower daily fluid removal (D/P creatinine versus fluid removal: $r = -0.23$, $p < 0.001$). Calculated osmolality was positively related to daily fluid removal ($r = 0.32$, $p < 0.001$).

Conclusions:

Calculated serum osmolality depends on peritoneal clearance. Higher fluid removal seems to sustain hyper-osmolality, whereas lower fluid removal is leading to hypo-osmolality. Fast peritoneal transport status is associated to reduced fluid removal causing secondarily hypo-osmolality.

Figure 1: Peritoneal clearances versus Osmolality.

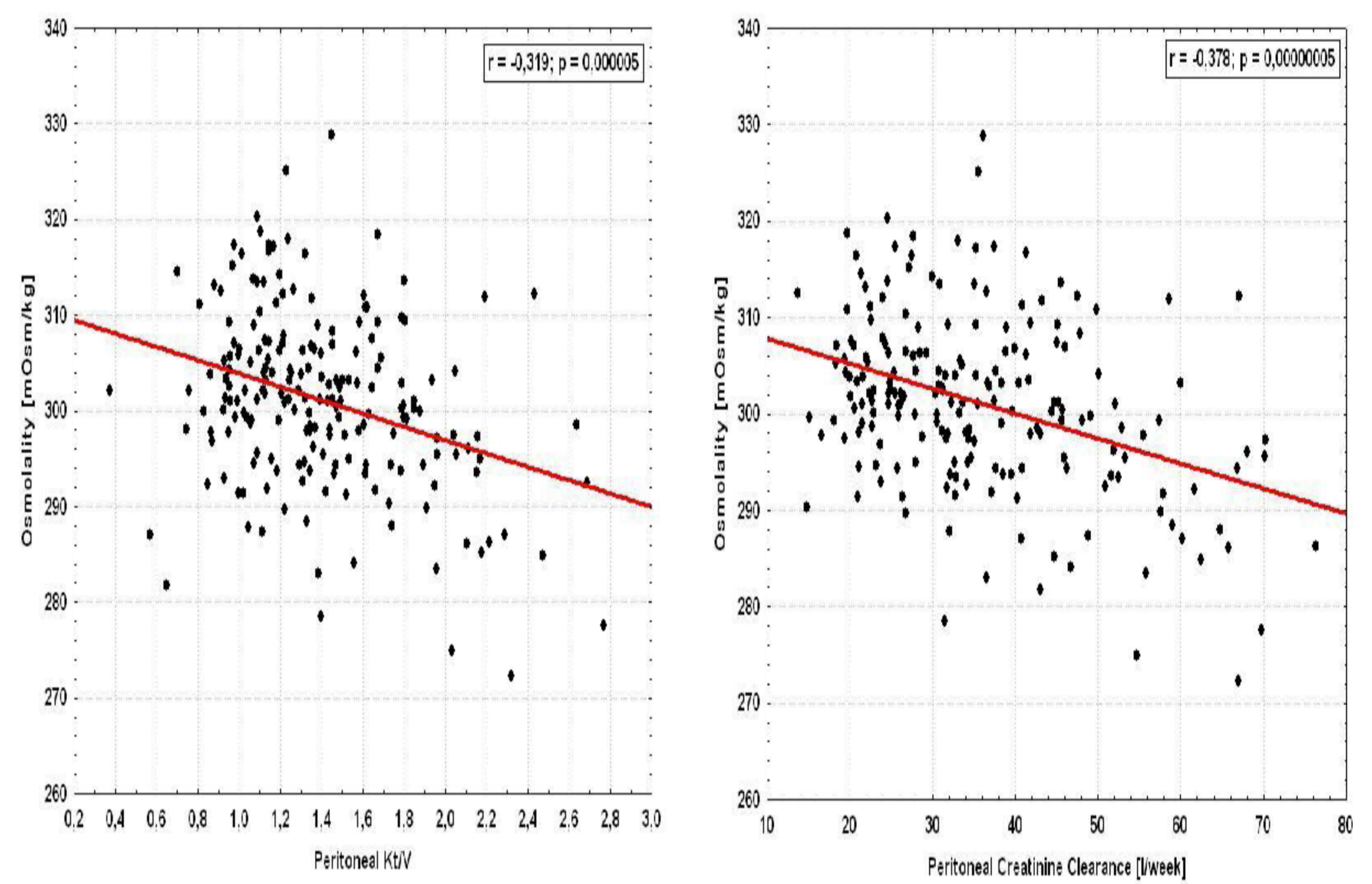


Figure 2: D/P Creatinine and Fluid Removal versus Osmolality.

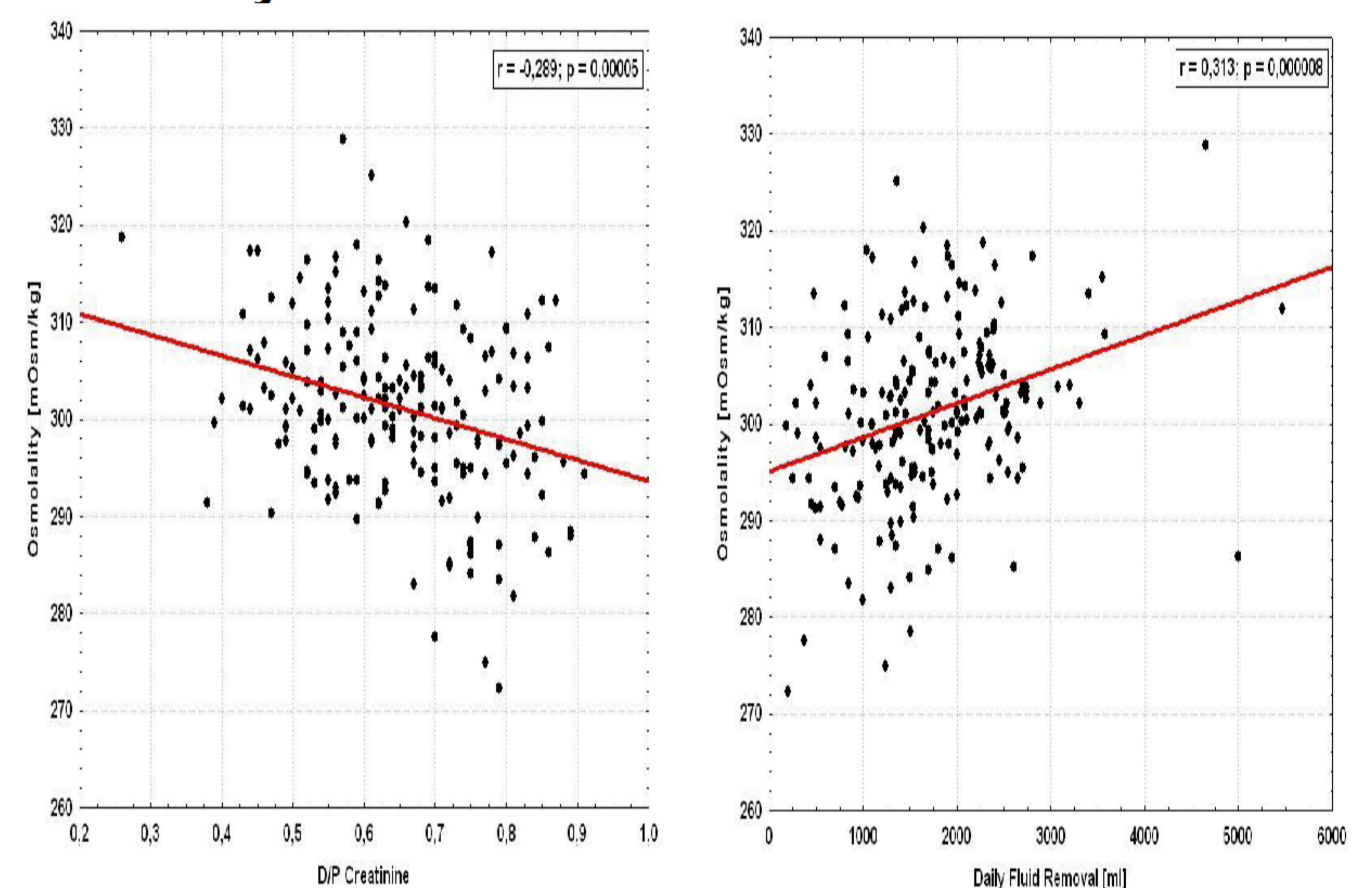
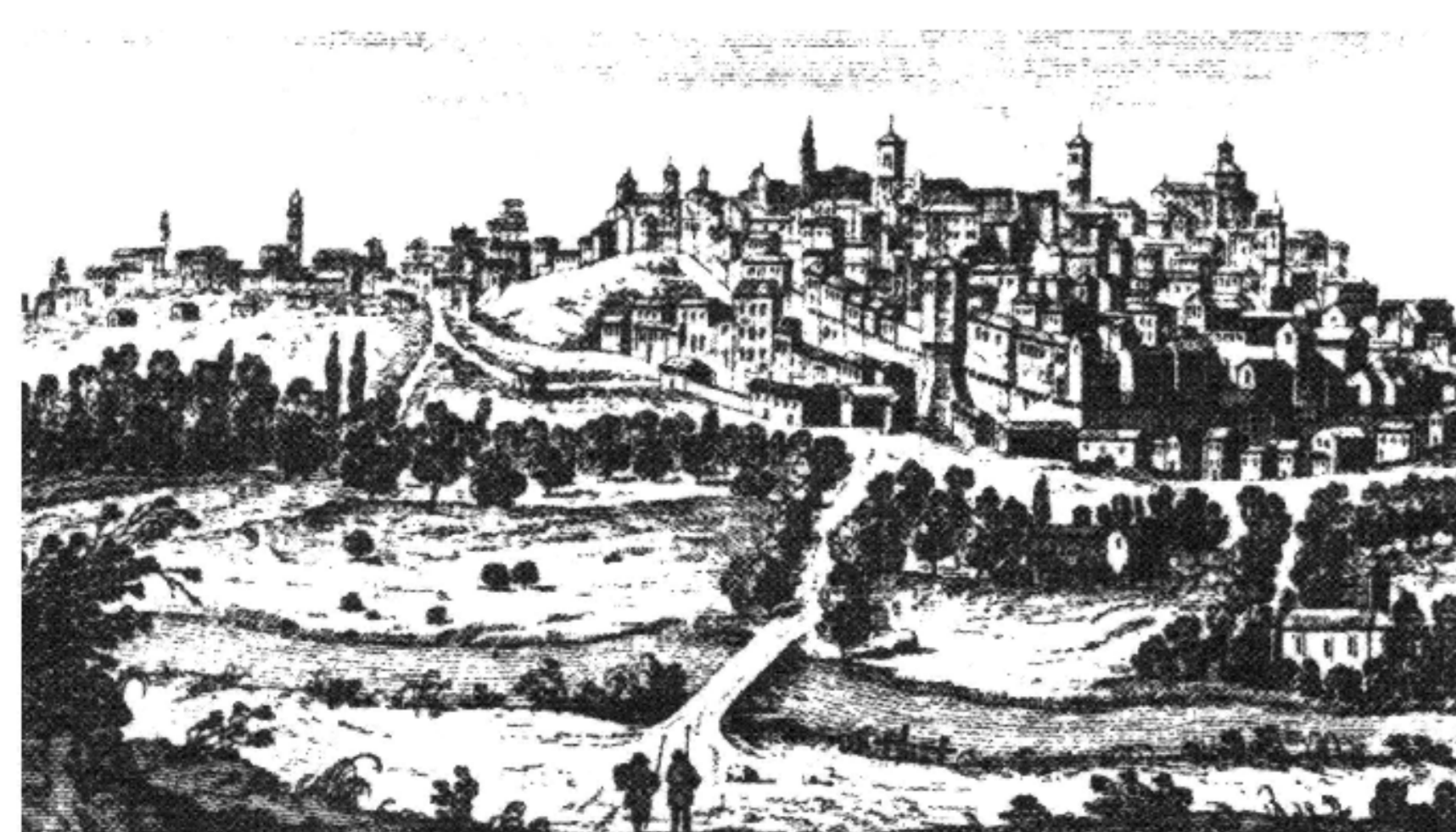
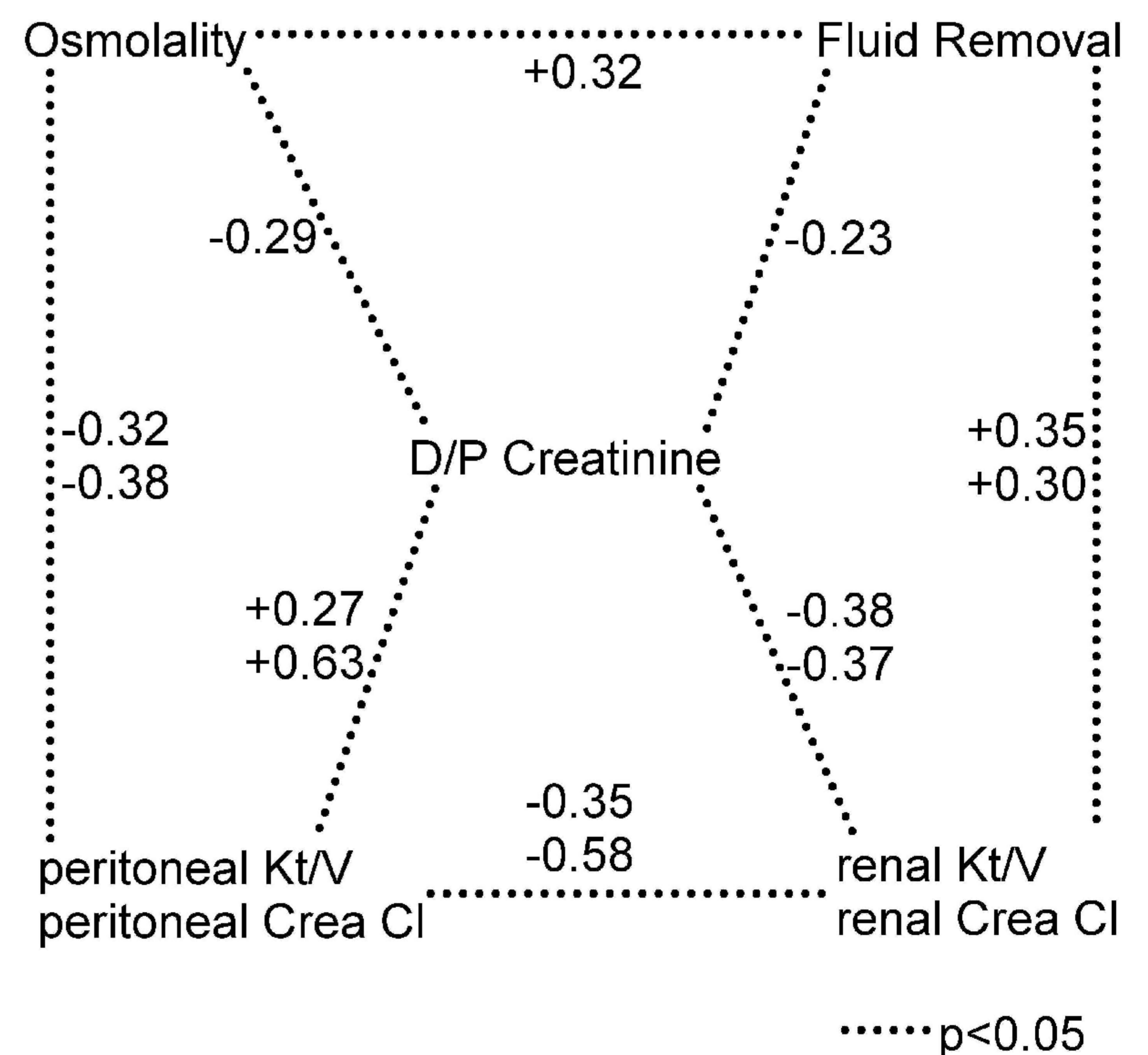


Figure 3: Linear correlations between variables.



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