

The role of preoperative CONtrolling NUTritional status (CONUT) score in the assessment of pathological features and survival outcomes in clear-cell renal cell carcinoma (ccRCC): a population-based study

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Objectives

To evaluate the correlation between pre-operative assessment of CONUT score and pathological features, overall survival (OS) and recurrence-free survival (RFS) in patients with primary diagnosis of clear-cell renal cell carcinoma and no evidence of clinical nodal/distant metastatic disease before surgery.

Materials and methods

We retrospectively reviewed clinical data of patients treated with radical nephrectomy from 2006 to 2017. Lymph nodes dissection was performed for cases with intraoperative evidence of lymphadenopathy or at surgeons' discretion for patients deemed to be at high risk for occult nodal metastases at the time of surgery. A population of 110 patients was enrolled. For each patient CONUT score was determined considering the values of pre-operative albumin, total cholesterol and lymphocyte count. ROC curve was calculated and an optimal cut-off point was set at 1. Patients were divided into 2 categories: low (<1) and high (>1) CONUT score. Univariate and multivariate analysis were performed. RFS and OS rates were calculated and compared between the two groups.

Table 1: Clinical and pathological features of study population

Variables	CONUT<1	CONUT>1	p value (CI 0.95)
N. patients	79(71.8%)	31(28.2%)	
Mean age at RN (±SD)	65,17±10,67	73,90±10,73	0
Sex male (ref. Female)	52(27)	13(18)	0,022
pT stage ≥ 3 (ref. <3)	19(60)	17(14)	0,002
pN stage = 1 (ref. X and 0)	0(79)	3(28)	0,005
Grading ≥3 (ref. ≤2)	32(47)	17(14)	0,174
Necrosis (ref. negative)	34(45)	16(15)	0,416
Venous thromb. (ref. neg)	8(71)	8(23)	0,036
Sarcomatoid diff. (ref. neg.)	3(76)	3(28)	0,222
Mean fibrinogen (±SD), mg/dl	394,86±168,79	461,37±185,51	0,001
Mean hospitalization (±SD), days	10,09±6,19	10,35±8,019	0,012
Mean follow-up (±SD), months	64,04±40,94	73,75±33,50	0
Clavien-Dindo ≥3 (ref. ≤2)	2(77)	2(9)	0,323
Charlson Comorbidity Index ≥2 (ref. <1)	26(53)	14(17)	0,23
Cancer-specific death (ref. not specific)	5(16)	2(10)	0,629

Results

High-CONUT patients were more frequently males ($p=0.002$) with pre-operative high mean fibrinogen levels ($p=0.001$), longer mean hospitalization ($p=0.012$), even with no differences in Clavien-Dindo score ($p=0.32$) and more severe pathological features (pT stage ≥ 3 , $p=0.002$; pN+, $p=0.005$; venous thrombus, $p=0.036$) than low-CONUT patients. No differences were observed in mean age and follow-up between the two cohorts. On multivariate analysis high-CONUT was significantly associated with worse OS (HR 10.96, 2.31-52.15; $p=0.003$), even if it didn't result as an independent factor, comparing to age (HR 0.06, 0.02-0.29; <0.0001) and pT stage ≥ 3 (HR 2.63, 1.41-4.91; $p=0.002$). High-CONUT wasn't significantly associated with worse RFS (HR 1.41, 0.47-4.21; $p=0.54$).

Table 1: Univariate and multivariate analysis

Variables	Univariate analysis			Multivariate analysis				
	RFS (95% IC)	p	OS (95% IC)	p	RFS (95% IC)	p	OS (95% IC)	p
Malesex (ref. female)	0,71 (0,25 - 2,01)	0,51	0,98 (0,61 - 1,56)	0,95	-	-	-	-
Age 70 or greater (ref.minus)	0,92 (0,31 - 2,75)	0,88	0,49 (0,3 - 0,83)	0,008	-	-	0,06 (0,02 - 0,29)	<0,0001
pT 3 or greater	4,25 (1,42 - 12,7)	0,01	1,99 (1,18 - 3,35)	0,009	2,1 (0,66 - 6,7)	0,21	2,63 (1,41 - 4,91)	0,002
High grade (ref. low)	8,9 (1,99 - 39,83)	0,004	0,85 (0,53 - 1,36)	0,5	6,44 (1,31 - 31,62)	0,02	0,74 (0,41 - 1,36)	0,34
High CONUT (Ref.low)	1,41 (0,47 - 4,21)	0,54	1,22 (0,71 - 2,09)	0,48	-	-	10,96 (2,31 - 52,15)	0,003
CCI 2 or greater (ref.low)	1,49 (0,52 - 4,28)	0,46	1,1 (0,64 - 1,80)	0,78	-	-	0,92 (0,53 - 1,61)	0,78
High Fibrinogen (ref. low)	1,31 (0,44 - 3,92)	0,63	1,03 (0,62 - 1,71)	0,89	-	-	0,79 (0,41 - 1,5)	0,47

Conclusions

CONUT score is a low time-consuming and a good cost-effective tool, which can be easily derived from blood values that are routinely checked before surgery. In this population-based study we found that in patients diagnosed with primary ccRCC with a clinical organ-confined disease, a pre-operative high-CONUT score was a strong predictor of worse pathological stage, lymphonode status and presence of renal vein thrombosis. Pre-operative evaluation of CONUT score could be of clinical usefulness in patients with known histology (e.g. patients who underwent renal biopsy before surgery).

Figure 1: CONUT score and RFS (red=high CONUT, blue=low CONUT), $p=0.54$

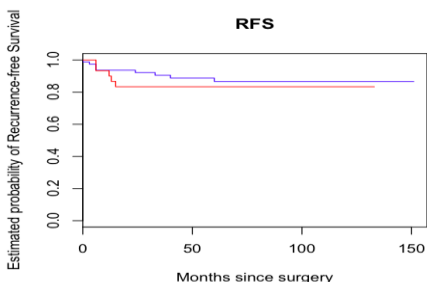
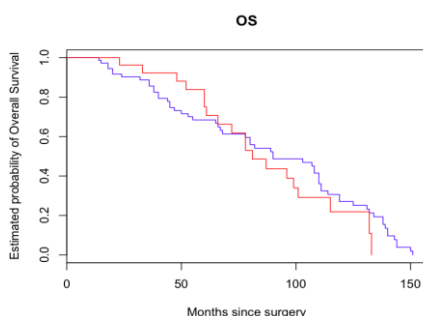


Figure 2: CONUT score and OS (red=high CONUT, blue=low CONUT), $p=0.003$



References

Ignacio de Ulibarri J et al. CONUT: a tool for controlling nutritional status. First validation in a hospital population. Nutr. Hosp. 2005