

Table 1. Baseline characteristics and demographics of metastatic urothelial carcinoma patients

	N=74	%	mean	±SD	Median	IQR
Age			67.00	±9.72	67	(60-73)
Female gender	28	(37.84%)				
ECOG						
0	32	(43.24%)				
1	32	(43.24%)				
2	10	(13.51%)				
Tumor sites						
UB	34	(45.95%)				
UT	39	(52.70%)				
UB+UT	1	(1.35%)				
Smoking	17	(22.97%)				
DM	19	(25.68%)				
CKD	23	(31.08%)				
ESRD	2	(2.70%)				
Metastasis site-Liver	8	(10.81%)				
Metastasis site-Lymph nodes	42	(56.76%)				
Metastasis site-Lung	22	(29.73%)				
Metastasis site-Others	15	(20.27%)				
WBC before ICI			8961.35	±4915.33	7845	(6170-10585)
Hemoglobin			11.53	±2.22	11.4	(9.98-13.2)
NLR			24.24	±30.02	5.9	(3.18-53.48)
Platelet			292.96	±109.23	262.5	(224.25-362)
LDH (n=64)			240.23	±125.66	195	(168.25-280.75)
Albumin (n=68)			3.84	±0.51	3.9	(3.4-4.28)

ICI treatment model					
Second-line therapy	24	(32.43%)			
First-line combination therapy	38	(51.35%)			
First-line monotherapy	12	(16.22%)			
ICI regimen					
Atezolizumab	53	(71.62%)			
Pembrolizumab	21	(28.38%)			
First-line cisplatin	52	(83.87%)			
Chemotherapy Response n=62					
CR	5	(8.06%)			
PR	24	(38.71%)			
SD	20	(32.263%)			
PD	13	(20.97%)			
Chemotherapy cycle (n=62)			4.78	±1.77	4 (3-6)
ICI Response					
CR	13	(17.57%)			
PR	29	(39.19%)			
SD	17	(22.97%)			
PD	15	(20.27%)			
ICI cycles			9.31	±9.53	6 (3-11)
ICI duration(month)			11.00	±10.51	7.24 (3.29-14.79)
Follow-up (month)			17.4	±14.5	12.7 (7.08-22.92)
Survival status					
Survive	44	59.46%			
Death	30	40.54%			

ECOG: Eastern Cooperative Oncology Group performance status; UB: urinary bladder; UT: upper urinary tract; DM: diabetes mellitus; CKD: chronic kidney disease; ESRD: end stage renal disease; WBC: white blood cell; ICI: immune checkpoint inhibitor; NLR: neutrophil/lymphocyte ratio; CR: complete response; PR: partial response; SD: stable disease; PD: progressive disease.

Table 2. Univariate and multivariate analysis for progression free survival after ICI treatment

	Univariate model			Multivariate model		
	HR	(95%CI)	p value	HR	(95%CI)	p value
ICI treatment model						
Second-line therapy		ref.				
First-line combination therapy	1.30	(0.59-2.84)	0.513			
First-line monotherapy	1.99	(0.78-5.05)	0.148			
Chemotherapy						
No		ref.				
Yes	0.59	(0.27-1.30)	0.188			
Chemotherapy response						
CR/PR		ref.			ref.	
PD/SD	3.25	(1.38-7.68)	0.007**	5.70	(2.04-15.90)	0.001**
No chemotherapy	3.58	(1.29-9.95)	0.014*	6.08	(1.79-20.57)	0.004**
Age	1.02	(0.98-1.06)	0.273			
Gender-Male	0.73	(0.38-1.41)	0.349			
Tumor sites						
UB		ref.				
UT	1.00	(0.51-1.95)	1.000			
UB+UT	1.00	(0.00-23655160)	1.000			
Smoking	1.33	(0.62-2.83)	0.466			
DM	0.67	(0.30-1.47)	0.314			
CKD	0.99	(0.49-1.98)	0.971			
ESRD	2.44	(0.58-10.25)	0.222			
Metastasis sites						
Liver	2.90	(1.26-6.71)	0.013*	5.40	(1.76-16.57)	0.003**
LN	1.71	(0.85-3.42)	0.133			
Lung	1.07	(0.54-2.15)	0.842			
Others	0.79	(0.31-2.03)	0.621			
Chemotherapy cycle	1.06	(0.84-1.33)	0.642			
ECOG						
0		ref.			ref.	
1+2	2.64	(1.29-5.40)	0.008**	6.08	(2.56-14.44)	<0.001**
HGB	0.87	(0.74-1.02)	0.083			

NLR	1.02	(1.004-1.03)	0.005**	1.02	(1.01-1.03)	0.002**
PLT	1.00	(1.00-1.00)	0.201			
LDH	1.00	(1.00-1.00)	0.069			
ALB	0.54	(0.29-0.99)	0.047*	0.64	(0.29-1.42)	0.268

Cox regression.*p<0.05, **p<0.01.

Table 3. Univariate and multivariate analysis for overall survival after metastatic urothelial carcinoma systemic treatment

	Univariate model			Multivariate model (n=62)		
	HR	(95%CI)	p value	HR	(95%CI)	p value
ICI treatment model						
Second-line therapy		ref.				
First-line combination therapy	2.31	(1.00-5.33)	0.050			
First-line monotherapy	1.90	(0.62-5.84)	0.261			
Chemotherapy						
No		ref.				
Yes	0.85	(0.32-2.24)	0.740			
Chemotherapy response						
CR/PR/SD		ref.				
PD	1.55	(0.67-3.57)	0.305			
No chemotherapy	1.34	(0.49-3.69)	0.571			
Age	1.02	(0.98-1.06)	0.369			
Gender-Male	0.89	(0.43-1.84)	0.745			
Tumor sites						
UB		ref.				
UT	1.00	(0.48-2.10)	1.000			
UB+UT	1.00	(0.00-14964350)	1.000			
Smoking	1.17	(0.52-2.63)	0.710			
DM	0.43	(0.16-1.12)	0.085			
CKD	0.88	(0.42-1.86)	0.746			
ESRD	0.05	(0.00-180.89)	0.466			
Metastasis sites						
Liver	4.60	(1.91-11.08)	0.001**	11.95	(3.22-44.34)	<0.001**
LN	1.79	(0.80-4.00)	0.153			
Lung	0.86	(0.39-1.90)	0.712			
Others	1.12	(0.45-2.74)	0.812			
Chemotherapy cycle	0.89	(0.70-1.14)	0.366			
ICI response (CR/PR vs PD/SD)	0.29	(0.13-0.63)	0.002**	0.22	(0.08-0.62)	0.004**
ECOG						
0		ref.			ref.	
1	2.86	(1.18-6.92)	0.020*	2.51	(0.81-7.76)	0.109
2	2.83	(0.97-8.22)	0.056	0.32	(0.08-1.33)	0.116
WBC before IO	1.0001	(1.0001-1.0002)	<0.001**	1.0001	(1.00001-1.0002)	0.036*
HGB	0.87	(0.72-1.03)	0.110			
NLR	1.01	(1.00-1.02)	0.120			

PLT	1.003	(1.0001-1.007)	0.042*
LDH	1.00	(1.00-1.00)	0.070
ALB	0.71	(0.34-1.46)	0.349

Cox regression.*p<0.05, **p<0.01.

Table 4. Univariate and multivariate analysis for ICI treatment response

	Univariate model			Multivariate model		
	OR	(95%CI)	p value	OR	(95%CI)	p value
ICI treatment model						
Second-line therapy		ref.				
First-line combination therapy	2.17	(0.76-6.21)	0.150			
First-line monotherapy	0.50	(0.12-2.12)	0.346			
Chemotherapy						
No		ref.				
Yes	3.17	(0.86-11.67)	0.083			
Chemotherapy response						
PD		ref.			ref.	
CR/PR/SD	5.10	(1.36-19.19)	0.016*	6.52	(1.45-29.24)	0.014*
No chemotherapy	1.12	(0.21-6.05)	0.891	1.37	(0.21-8.71)	0.742
Age	1.00	(0.95-1.05)	0.903			
Gender-Male	1.23	(0.48-3.17)	0.666			
Tumor sites						
UB		ref.				
UT	0.91	(0.36-2.30)	0.835			
UB+UT	0.00	(0.00-	1.000			
Smoking	1.12	(0.37-3.35)	0.845			
DM	1.94	(0.64-5.85)	0.238			
CKD	0.99	(0.37-2.66)	0.978			
ESRD	0.00	(0.00-	0.999			
Metastasis sites						
Liver	1.31	(0.29-5.92)	0.729			
LN	0.32	(0.12-0.86)	0.024*	0.31	(0.10-0.94)	0.038*
Lung	1.15	(0.42-3.15)	0.792			
Others	2.48	(0.71-8.70)	0.155			
Chemotherapy cycle	1.14	(0.84-1.53)	0.406			
ICI cycles	1.02	(0.97-1.08)	0.367			
ECOG						
0		ref.			ref.	
1+2	0.32	(0.12-0.86)	0.024*	0.32	(0.11-0.95)	0.040*
WBC before ICI	1.00	(1.00-1.00)	0.355			
HGB	1.18	(0.95-1.47)	0.134			
NLR	0.98	(0.97-0.998)	0.027*	0.99	(0.97-1.01)	0.282
PLT	1.00	(1.00-1.00)	0.889			
LDH	1.00	(1.00-1.00)	0.727			
ALB	1.27	(0.50-3.27)	0.615			

Logistic regression.*p<0.05, **p<0.01.