

Chronic kidney disease and cancer: a troubling connection.

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Table 2 - Relative risk of cancer in patients with non end-stage CKD and in those on dialysis or with a kidney transplant for end-stage CKD

Cancer site	Non end-stage CKD			Dialysis			Kidney Transplant		
	[Ref]	n	RR or HR (95%CI) ^{a,b} or SIR (95%CI) ^c	[Ref]	n	SIR (95%CI)	[Ref]	n	SIR (95%CI) or RR (95%CI) ^d
All cancer	[17]	M : 245	1.3 (1.1,1.5) ^a	[9] ANZ	500	1.8 (1.7,2.0)	[11]	639	3.9 (3.6,4.2)
		W : 237	1.0 (0.9,1.2) ^a	[9] Euro	6,849	1.1 (1.0,1.1)	[12] ^d	-	-
	[16]	590	1.2 (p<0.001) ^b	[9] USA	17,695	1.2 (1.2,1.2)	[14]	778	2.5 (2.3,2.7) ^e
	[13]	689	1.2 (1.1,1.3) ^c	[13]	870	1.4 (1.3,1.5)	[13]	1,236	3.3 (3.1,3.5) ^e
Genitourinary									
Kidney	[16]	17	1.4 (1.0,2.1) ^b	[9] ANZ	70	9.8 (7.7,12.3)	[11]	28	5.2 (3.4,7.5)
	[13]	193	13.2 (11.4,15.1) ^c	[9] Euro	680	3.3 (3.1,3.6)	[12] ^d	-	14.6
				[9] USA	1,303	3.7 (3.5,3.9)	[14]	71	7.3 (5.7,9.2)
				[13]	86	5.6 (4.5,7.0)	[13]	70	7.3 (5.7,9.2)
Bladder (B) or urinary tract (UT)	[17]	M : 16 (UT)	5.0 (p<0.04) ^{a†}	[9] ANZ	53	4.8 (3.6,6.2)	[11]	-	-
	[16]	35 (B)	1.8 (1.5,2.3) ^b	[9] Euro	660	1.5 (1.4,1.7)	[12] ^d	-	3.6
	[13]	85 (B)	2.7 (2.2,3.4) ^c	[9] USA	933	1.4 (1.3,1.5)	[14]	24	2.0 (1.3,3.0)
				[13]	63	2.2 (1.7,2.9)	[13]	42	3.3 (2.4,4.5)
Uterus cervix	[13]	11	1.6 (0.8,2.9) ^c	[9] ANZ	15	4.0 (2.4,6.6)	[11]	-	-
				[9] Euro	146	1.6 (1.3,1.8)	[12] ^d	-	5.7
				[9] USA	290	2.5 (2.2,2.8)	[14]	6	1.6 (0.6,3.4)
				[13]	13	2.6 (1.4,4.4)	[13]	13	2.5 (1.3,4.3)
Prostate	[17]	62	NS	[9] ANZ	36	1.2 (0.9,1.7)	[11]	20	1.1 (0.7,1.7)
	[16]	110	1.0 (0.9,1.3)	[9] Euro	422	0.9 (0.8,1.0)	[12] ^d	-	1.6
	[13]	153	1.2 (1.0, 1.4)	[9] USA	2,018	0.7 (0.6,0.7)	[14]	37	0.9 (0.6,1.3)
				[13]	74	0.7 (0.5,0.8)	[13]	41	1.0 (0.7,1.3)
Hematopoietic									
Non-Hodgkin lymphoma	[13]	35	1.5 (1.1,2.1)	[9] ANZ	11	1.4 (0.8,2.6)	[11]	27	3.8 (2.5,5.6)
				[9] Euro	102	0.6 (0.5,0.8)	[12] ^d	-	29.1
				[9] USA	736	1.7 (1.5,1.8)	[14]	155	9.9 (8.4-11.5)
				[13]	35	1.5 (1.1,2.1)	[13]	125	8.8 (7.4,10.5)
Leukemia	[13]	16	0.9 (0.5,1.4)	[9] ANZ	11	1.4 (0.8,2.6)	[11]	-	-
				[9] Euro	102	0.6 (0.5,0.8)	[12] ^d	-	7.9
				[9] USA	736	1.7 (1.5,1.8)	[14]	17	2.3 (1.3,3.6)
				[13]	35	1.5 (1.1,2.1)	[13]	24	2.5 (1.7,3.7)

Oral cavity									
Lip (L)	[13]	22 (L)	1.9 (1.2,2.8) ^c	[9] ANZ	3 (T)	1.9 (0.6-5.9)	[11]	39 (L)	54.8 (39.0,74.9)
Tongue (T)				[9] Euro	90(T)	2.0 (1.6-2.5)	[12] ^d	- (M)	11.1
or Mouth (M)				[9] USA	144(T)	1.8 (1.5-2.1)	[14]	54 (L)	31.3 (23.5,40.8)
				[13]	29 (L)	3.7 (2.5-5.3)	[13]	283 (L)	47.1 (42.8,52.3)
Digestive									
Colon	[17]	M :35 F :41	NS NS	[9] ANZ	49	1.1 (0.9,1.5)	[11]	25	2.4 (1.5,3.5)
	[16]	90	1.1 (1.0,1.4) ^b	[9] Euro	831	0.9 (0.9,1.0)	[12] ^d	-	2.8
	[13]	83	1.3 (1.1,1.7) ^c	[9] USA	2,343	1.2 (1.1,1.2)	[14]	51	1.4 (1.0,1.8)
				[13]	78	1.2 (0.9,1.5)	[13]	82	2.4 (1.9,2.9)
Liver	[13]	4	2.9 (0.8,7.3) ^c	[9] ANZ	3	1.5 (0.5,4.6)	[11]	-	-
				[9] Euro	162	1.2 (1.0,1.4)	[12] ^d	-	4.5
				[9] USA	192	1.5 (1.3,1.7)	[14]	5	1.8 (0.6,4.3)
				[13]	14	2.3 (1.3,3.8)	[13]	10	3.2 (1.5,5.9)
Skin									
Melanoma (MA)		79 (MA)	1.0 (0.8,1.3)	[13]	57 (MA)	1.0 (0.8,1.4)	[11]	267 (NMA)	57.7 (51.0,65.1)
Nonmelanoma skin (NMA)	[13]	3 (K)	19.6 (4.1, 57.4)		6 (K)	58.9 (21.2,126.0)	[12] ^d	- (NMA)	92.3
Kaposi sarcoma (K)							[14]	20 (MA)	1.9 (1.2,3.0)
							[13]	111 (MA)	2.5 (2.1,3.1)
Other									
Lung	[17]	M :27 F :18	9.0 (2.0, 30.0) ^{a†} NS	[9] ANZ	57	1.4 (1.1,1.8)	[11]	24	1.7 (1.1,2.5)
	[16]	77	1.2 (1.0,1.5) ^b	[9] Euro	978	0.9 (0.8,0.9)	[12] ^d	-	3.6
	[13]	34	1.1 (0.7,1.5)	[9] USA	2,901	1.1 (1.1,1.2)	[14]	108	2.1 (1.7,2.5)
				[13]	135	1.6 (1.3,1.9)	[13]	102	1.7 (1.1,2.5)
Thyroid	[13]	15	2.6 (1.4,4.2)	[9] ANZ	11	5.9 (3.3,10.7)	[11]	6	3.8 (1.4,8.2)
				[9] Euro	87	1.9 (1.5,2.3)	[12] ^d	-	14.7
				[9] USA	216	2.4 (2.1,2.8)	[14]	31	6.9 (4.7,9.8)
				[13]	38	9.2 (6.5,12.7)	[13]	23	5.0 (3.1,7.4)

N : number of observed cancers ; SIR : standardized incidence ratio ; RR : relative risk or rate ratio ; HR : hazard ratio ; 95% CI : 95% confidence interval ; NS : non significant ; NA : not available because of insufficient number of cancer cases ; M : men ; W : women

eGFR : estimated GFR with the abbreviated MDRD equation in ml/min/1.73 m² ;

^aPer 10 ml/min/1.73 m² decrease in eGFR ; ^{a†}HR for an eGFR < 40 as compared to > 40 ml/min/1.73 m² , adjusted for age, smoking, sun-related skin damage and blood pressure

^bHR of cancer per 1-SD increase of log ACR, ^cSIR of cancer up to 5 yrs before RRT as compared to the general population

^dAge-adjusted rate ratio (n cases and CI not available) for cancer in women (except for prostate) 3 years after kidney transplantation

^eExcluding nonmelanoma skin cancer