

Prevalence of the metabolic syndrome and cardiovascular disease risk in chemotherapy-treated testicular germ cell tumour survivors

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Correction to: *British Journal of Cancer* (2013) **109**, 60–67. doi:10.1038/bjc.2013.226

Since the advance online publication of this paper in May 2013, the authors realised that fresh calculations of the cohort of testicular cancer patients were required after omitting nine patients who received radiotherapy. This resulted in slightly incorrect

numbers presented in the data displayed in Tables 2, 4 and 5, and in sections of the Results.

In order to present the results correctly moving forward, the data have now been corrected in the paper which appears in this issue and are represented in the Tables following (see below).

Table 2. Characteristics of GCT survivors according to treatment group and of healthy subjects

Parameters	Treatment groups				All survivors (N = 255)	P-value ^a	P-value ^b
	Healthy subjects (N = 360)	Surgery (N = 58)	Carboplatin (N = 21)	Combination CT (N = 176)			
Demographics: mean ± s.d., median (min–max)							
Age at diagnosis (years)	NA	30.4 ± 8.3 28.9 (20.0–61.9)	37.6 ± 12.2 33.8 (24.8–50.6)	31.2 ± 8.8 29.6 (14.2–54.2)	31.4 ± 8.7 29.8 (14.2–61.9)	~	~
Age at blood analysis (years)	43.1 ± 14.6 44.0 (18–70)	36.6 ± 10.4 36.5 (20.1–69.5)	42.1 ± 12.0 39.3 (26.8–57.4)	38.7 ± 10.9 38.7 (18.2–63.4)	39.2 ± 10.7 38.3 (18.2–69.5)	NS	NS
Interval between curative treatment and blood analysis (years)	NA	6.2 ± 6.7 3.2 (0.1–2)	4.5 ± 3.5 3.1 (0.7–13.2)	8.8 ± 7.8 6.3 (0.6–30.2)	7.8 ± 7.4 5.0 (0.1–30.2)	~	~
Clinical characteristics: median (min–max)							
Body weight (kg)	85 (54–138)	82 (60–138)	83 (64–132)	85 (60–126)	84 (60–138)	0.005	0.01
Height (m)	1.80 (1.57–2.06)	1.85 (1.65–1.99)	1.83 (1.69–1.98)	1.83 (1.65–2.01)	1.83 (1.65–2.01)	0.006	<0.001
Body mass index (kg m ⁻²)	25.8 (19.5–42.6)	24.2 (16.8–38.5)	25.0 (20.5–35.8)	25.6 (18.4–36.4)	25.5 (16.8–38.5)	NS	0.01
Waist circumference (cm)	94 (74–130)	92 (85–134)	96 (81–137)	96 (67–124)	96 (67–137)	<0.001	0.003
Systolic blood pressure (mm Hg) ^c	130 (110–200)	122 (95–185)	130 (90–155)	126 (90–200)	125 (90–200)	NS	0.006
Diastolic blood pressure (mm Hg) ^c	80 (62–110)	80 (54–110)	80 (65–90)	80 (53–114)	80 (53–114)	NS	NS
Creatinine clearance (Cockcroft formula; ml min ⁻¹)		122 (84–205)	120 (70–165)	123 (56–217)	122 (56–217)	~	~

Abbreviations: CT = chemotherapy; GCT = germ cell tumour; NA = not applicable; NS = not significant.

^aP-value for comparison between values of combination-CT survivors and healthy subjects (independent-samples Student's t-test or independent-samples Mann–Whitney where appropriate).

^bP-value for comparison between values of all survivors and healthy subjects (independent-samples Student's t-test or independent-samples Mann–Whitney where appropriate).

^cSystolic and diastolic blood pressure measurements for survivors treated with anti-hypertensive medication are excluded.

Table 4. Prevalence of metabolic syndrome according to NCEP-ATPIII (upper part) and IDF criteria (lower part) in survivors and in healthy subjects

Parameters (%)	Treatment groups				Survivors (N = 251 ^a)	Combination CT, OR (95% CI) ^b	Survivors OR (95% CI) ^c
	Healthy subjects (N = 360)	Surgery (N = 57 ^a)	Carboplatin (N = 20 ^a)	Combination CT (N = 174 ^a)			
According to NCEP-ATP III							
Hypertension	81 (22.5)	8 (14.0)	4 (20.0)	53 (31.0)	66 (26.3)	1.6 (1.0–2.3)	1.2 (0.8–1.8)
Obesity	70 (19.4)	10 (17.5)	6 (30.0)	51 (29.3)	67 (26.7)	1.7 (1.1–2.6)	1.5 (1.0–2.2)
Insulin resistance	16 (4.4)	2 (3.5)	1 (5.0)	11 (6.3)	14 (5.6)	1.5 (0.7–3.2)	1.3 (0.6–2.7)
Dyslipidemia ^d	36 (10.0)	7 (12.3)	4 (20.0)	35 (20.1)	46 (18.3)	2.3 (1.4–3.8)	2.0 (1.3–3.2)
Hypertriglyceridemia ^d	84 (23.3)	13 (22.8)	6 (30.0)	61 (35.1)	80 (31.9)	1.8 (1.2–2.6)	1.5 (1.1–2.2)
Metabolic syndrome	29 (8.1)	5 (8.8)	2 (10.0)	29 (16.7)	36 (14.3)	2.3 (1.3–4.0)	1.9 (1.1–3.2)
According to IDF							
Hypertension	170 (47.2)	21 (36.8)	8 (40.0)	83 (47.7)	112 (44.6)	1.0 (0.7–1.5)	0.9 (0.7–1.2)
Obesity	165 (45.8)	24 (42.1)	13 (65.0)	107 (61.5)	144 (57.4)	1.9 (1.3–2.7)	1.6 (1.1–2.2)
Insulin resistance	57 (15.8)	6 (10.5)	3 (15.0)	34 (19.5)	43 (17.1)	1.3 (0.8–2.1)	1.1 (0.7–1.7)
Dyslipidemia ^d	36 (10.0)	7 (12.3)	4 (20.0)	35 (20.1)	46 (18.3)	2.3 (1.4–3.8)	2.0 (1.3–3.2)
Hypertriglyceridemia ^d	84 (23.3)	13 (22.8)	6 (30.0)	61 (35.1)	80 (31.9)	1.8 (1.2–2.6)	1.5 (1.1–2.2)
Metabolic syndrome	59 (16.4)	9 (15.8)	5 (25.0)	52 (29.9)	66 (26.3)	2.2 (1.4–3.3)	1.8 (1.2–2.7)

Abbreviations: CT = chemotherapy; CI = confidence interval; GCT = germ cell tumour; IDF = International Diabetes Federation; OR = odds ratio; NCEP-ATPIII = National Cholesterol Education Program Adult Treatment Panel III 2001.

^aFour survivors diagnosed with diabetes mellitus before orchidectomy (N = 1), single-dose carboplatin (N = 1), or combination CT (N = 2) are excluded in this table.

^bOR for risk stratification between healthy subjects and combination CT survivors.

^cOR for risk stratification between healthy subjects and all GCT survivors.

^dPrevalence of dyslipidemia and hypertriglyceridemia are similar according to NCEP-ATPIII and IDF criteria.

Table 5. Metabolic syndrome prevalence and odds ratio's in four cross-sectional studies

Parameters	Nuver et al (2005)	Haugnes et al (2007)		Wethal et al (2007)	this study	
Number of survivors	130	1135		589	251	
Mean age (years) (range)	38.5 (20–65)	42.5 (23–60)		42 (23–60)	39.6 (18–70)	
Mean follow-up time (years) (range)	7.5 (3–13)	11.2 (5–22)		11 (7.7–14.5)	7.8 (0.1–30.0)	
Healthy subjects (N)	47	1150		8835	360	
Metabolic syndrome definition	NCEP-ATP III	Modified NCEP-ATP III ≥ 2 criteria ^a	Modified NCEP-ATP III ≥ 3 criteria ^a	Modified criteria ≥ 3 criteria ^a	NCEP-ATP III	IDF
Metabolic syndrome prevalence (%)						
All GCT survivors	38 (29.2)	447 (39.4)	92 (8.1)	82 (13.9)	36 (14.3)	66 (26.3)
Combination CT	22 (25.6)	191 (41.2)	40 (8.6)	38 (17.4)	29 (16.7)	52 (29.9)
Single-dose carboplatin	~	~	~	~	2 (10.0)	5 (25.0)
Radiotherapy	~	184 (42.0)	37 (8.3)	35 (15.2)	~	~
Surgery only	16 (34.0)	72 (33.0)	15 (6.7)	9 (6.4)	5 (8.8)	9 (15.8)
Healthy subjects	4 (8.5)	584 (51.5)	170 (14.8)	Not mentioned	29 (8.1)	59 (16.4)
OR (95% CI) adjustments^b						
GCT survivors vs healthy subjects	4.4 (1.5–13.2)	0.6 (0.5–0.7)	0.5 (0.4–0.7)	~	1.9 (1.1–3.2)	1.8 (1.2–2.7)
Combination CT vs healthy subjects	3.7 (1.2–11.5)	0.7 (0.5–0.8)	0.5 (0.4–0.8)	3.7 (1.5–9.1)	2.3 (1.3–4.0)	2.2 (1.4–3.3)
Combination chemotherapy vs surgery only	0.6 (0.3–1.3)	1.5 (1.1–2.1)	1.3 (0.7–2.4)	3.1 (1.4–6.6)	2.1 (0.8–5.7)	2.3 (1.0–5.0)

Abbreviations: CI = confidence interval; CT = chemotherapy; GCT = germ cell tumour; IDF = International Diabetes Federation; OR = Odds ratio; NCEP-ATPIII = National Cholesterol Education Program Adult Treatment Panel III 2001.

^aNon-fasting blood samples.

^bCalculated from the raw data presented in the individual reports.