

Table 2.42. Case-control studies of consumption of alcoholic beverages and breast cancer by receptor status

Reference, study location, period	Characteristics of cases	Characteristics of controls	Exposure assessment	Exposure categories	Relative risk (95% CI)	Relative risk (95% CI)	Adjustment factors	Comments
Deandrea <i>et al.</i> (2008) Italy, 1991–94	2569 (989 with receptor status) identified through hospitals; aged 23–74 years; 100% histologically confirmed; response rate ~95%	1350 hospital (non-malignant, non-gynaecological and non-alcohol related disease); aged 20–74 years; not individually matched; response rate ~95%	Interviewer-administered questionnaire	<i>Alcohol intake (g/d)</i>	<i>ER+</i> (762)	<i>ER-</i> (227)	Age, centre, education, parity, menopausal status, age at menarche, family history, body mass index, energy intake	Significant heterogeneity between <i>ER+</i> and <i>ER-</i> tumours ($P = 0.006$); stronger association per 10 g/d in <i>ER+</i> tumours in pre/perimenopausal women (OR: 1.21, 95% CI: 1.10–14.32), and among women with a high folate intake (OR: 1.21, 95% CI: 1.11–1.30 for $\geq 264.4 \mu\text{g/d}$).
				Never	1.0	1.0		
				< 13.8	1.51 (1.18–1.93)	1.57 (1.09–2.26)		
				≥ 13.8	2.16 (1.68–2.76)	1.36 (0.93–2.01)		
				per 10 g/d	1.13 (1.07–1.20)	not given		
					<i>ER+/PR+</i> (661)	<i>ER-/PR-</i> (171)		
				Never	1.0	1.0		
				< 13.8	1.60 (1.24–2.08)	1.54 (1.02–2.32)		
				≥ 13.8	2.34 (1.81–3.04)	1.25 (0.81–1.94)		
				per 10 g/d	1.14 (1.07–1.20)	not given		
					<i>ER+/PR-</i> (101)	<i>ER-/PR+</i> (56)		
				Never	1.0	1.0		
< 13.8	1.02 (0.60–1.74)	1.63 (0.81–3.28)						
≥ 13.8	1.30 (0.76–2.24)	1.72 (0.83–3.59)						
per 10 g/d	1.07 (0.95–1.21)	1.11 (0.95–1.28)						
Millikan <i>et al.</i> (2008), USA, Carolina Breast Cancer Study, 1993–2001; case-only analysis presented	Original population of 2 311 invasive and in situ tumours; aged 18–70 years; 62% had receptor information – of the 1 424 tumours in the present study population, 628 were considered ‘cases’ and categorised as luminal B, triple-negative, HER2+ overexpressing, and unclassified tumours	796 Luminal A tumours	Interviewer-administered questionnaire	<i>Alcohol use</i>	<i>Luminal B (ER/PR+/HER2+ (137))</i>	<i>HER2+ overexpressing (ER-/PR-/HER2+ (116))</i>	Age, race	Case-only analysis; case-control analysis did not present results for alcohol intake
				Never	1.0	1.0		
				Ever	1.4 (0.9–2.2)	1.0 (0.6–1.5)		
					<i>Unclassified (150)</i>	<i>Triple-negative (ER-/PR-/HER2- (225))</i>		
				Never	1.0	1.0		
				Ever	0.6 (0.4–0.9)	0.9 (0.6–1.2)		

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Dolle <i>et al.</i> (2009), USA, 2 case-control studies in Seattle, 1983–1992	897 invasive cases; recruited 1983–1992; aged 21–45 years; response rate 83% and 86% in the two studies	1569 population-based (random digit-dialling), matched by age; response rate 71% and 76% in the two studies	Interviewer-administered questionnaire	<i>Alcohol use (drinks/week)</i> None or < 1 1–2 ≥ 3 p for trend	<i>Non triple-negative (710)</i> 1.0 1.0 (0.7–1.4) 1.1 (0.8–1.4) 0.54	<i>Triple-negative (187)</i> 1.0 0.8 (0.5–1.4) 1.1 (0.7–1.6) 0.84	Age, family history, breastfeeding, duration of oral contraceptive use	Premenopausal women only; triple-negative tumours defined as ER-/PR-/HER2-tumours; no significant differences
Kwan <i>et al.</i> (2009), USA (2 studies: Life After Cancer Study [LACE], 2000–2002; Pathways Study, 2006–2008); Case-only analysis	676 early-stage invasive tumours largely derived from one Cancer Registry; 100% histologically confirmed; aged 18–70 years; cases categorised as luminal B (294), triple-negative (288) and HER2+ only (94) tumours	1868 luminal A cases diagnosed from the same Cancer Registry	Self-administered questionnaire (LACE); in-person interview (Pathways)	<i>Alcohol use</i> Never Ever Never Ever	<i>Luminal B ER/PR+/HER2+ (294)</i> 1.0 0.74 (0.56–0.98) 1.0 0.98 (0.73–1.30)	<i>HER2+ overexpressing ER-/PR-/HER2+ (94)</i> 1.0 0.94 (0.59–1.50) <i>Triple-negative ER-/PR-/HER2- (288)</i> 1.0 0.98 (0.73–1.30)	Age at diagnosis, race, study	Case-only analysis where luminal A (ER/PR+/HER2-) cases are the reference group (<i>n</i> = 1 868); ER/PR+ defined as either ER+ and/or PR+; no data on dose–response

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Trivers <i>et al.</i> (2009), USA, 1990–92	476 cases with histological confirmation; aged 20–54 years; response rate 86%	913 population-based (random digit-dialling), matched by age; response rate 71%	Interviewer-administered questionnaire, or telephone interview	<i>Alcohol intake (drinks/week)</i>	<i>Luminal A ER/PR+/HER2- (272)</i>	<i>HER2+ overexpressing ER-/PR-/HER2+ (33)</i>	Age, race	ER/PR+ defined as either ER+ and/or PR+					
						Never			1.0	1.0			
						< 7			1.68 (1.30–2.17)	2.09 (1.10–4.00)			
						≥ 7			1.86 (1.34–2.60)	2.98 (1.40–6.35)			
						Never			<i>Luminal B ER/PR+/HER2+ (36)</i>	<i>Triple-negative ER-/PR-/HER2- (135)</i>	1.0	1.0	
											< 7	1.08 (0.61–1.93)	1.16 (0.84–1.59)
											≥ 7	1.29 (0.61–2.75)	1.22 (0.79–1.89)

ER, estrogen receptor; HER2, human epidermal growth factor protein; PR, progesterone receptor