Table 2.7. Case–control studies of Epstein-Barr virus infection markers and nasopharyngeal carcinoma (NPC)

Reference, study location and period	Characteristics of cases	Characteristics of controls	Detection method	Exposure categories	No. of exposed cases	Odds Ratio (95% CI)	Adjusted potential confounders	Comments
Mutirangura *et al.* (1998) Thailand 1996–1997	42 cases of NPC enrolled from a university hospital	82 healthy blood donor controls	EBV DNA (*EBNA*-2) in serum tested by PCR	EBV DNA – +	 29 13	 1.0 ∞	No	No control was positive for EBV DNA. Controls were younger than cases. Apoptosis was significantly associated with EBV DNA level.
Lo *et al.* (1999) Hong Kong	57 cases of histologically confirmed NPC enrolled from a general hospital	43 relative controls unaffected with NPC	EBV DNA (*Bam* HI-W and *EBNA*-1) in plasma tested by real-time quantitative PCR	EBV DNA – +	 2 55	 1.0 [375.8 (50.6-3864.3)]	No	Plasma EBV DNA levels increased with NPC stage.
Lin *et al.* (2001) Taiwan	34 newly diagnosed and 4 initially treated (by radiotherapy) cases of histologically confirmed NPC	20 patients with other head and neck cancers and 8 family members of NPC cases	EBV DNA *(LMP-1)* in nasopharyngeal swab by PCR	EBV DNA – +	 2 36	 1.0 ∞	No	No control had detectable EBV DNA in nasopharyngeal swab. EBV DNA in nasopharyngeal swab was positive in 6 of 59 treated NPC patients. Only one of them showed local recurrence.

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Reference, study location and period	Characteristics of cases	Characteristics of controls	Detection method	Exposure categories	No. of exposed cases	Odds Ratio (95% CI)	Adjusted potential confounders	Comments
Chen *et al.* (2001) Taiwan, 1991–1994	364 incident cases of pathologically confirmed NPC enrolled from 2 medical centres	320 age- and sex-matched community controls	Anti-EBNA-1 IgA by ELISA, Anti-EBV VCA IgA by indirect immunofluorescence, and anti-EBV DNase by neutralization test.	EBNA-1 – + VCA IgA – + DNase – +	 67 247 82 276 56 305	 1.0 [93.3 (46.0–205.8)] 1.0 [62.6 (34.6–118.9] 1.0 [40.9 (25.4–66.2]	No	
Leung *et al.* (2004) Hong Kong 1998–2000	139 incident cases of histologically confirmed NPC	178 healthy individuals from a community centre	EBV DNA (*Bam* HI-W) in plasma by real-time quantitative PCR Anti-EBV VCA IgA by semiquantitative immunofluorescence method	Anti-EBV VCA – + EBV DNA – +	 27 112 7 132	 1.0 88.1 [36.9–227.6] 1.0 820.3 [212.1–3638.8]	No	Sex distribution was different in cases and controls (74% male in cases vs. 26% male in controls).
Lin *et al.* (2004) Taiwan 1999–2002	99 newly diagnosed cases of histologically confirmed NPC	40 healthy volunteers	EBV DNA (*Bam* HI-W) in plasma by real-time quantitative PCR	EBV DNA – +	 5 94	 1.0 ∞	No	Characteristics of healthy volunteer controls were unavailable. No control had detectable EBV DNA in plasma. Overall survival and relapse-free survival were significantly lower among patients with high viral load.

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Reference, study location and period	Characteristics of cases	Characteristics of controls	Detection method	Exposure categories	No. of exposed cases	Odds Ratio (95% CI)	Adjusted potential confounders	Comments
Fan *et al.* (2004) Hong Kong	93 untreated cases of histologically confirmed NPC	17 unaffected relatives of NPC patients and 23 healthy individuals	EBV DNA (*Bam* HI-W) in serum by real-time PCR assay Anti-EBV EA IgA and IgG by indirect immunofluorescence	EBV DNA			No	Characteristics of controls were unavailable. No control was positive for anti-EBV EA IgA.
				–	29	1.0		
				+	64	[86.1 (12.8-3537.5)]		
				Anti-EBV EA IgA				
				–	25	1.0		
				+	68	∞		
				Anti-EBV EA IgG				
				–	4	1.0		
				+	55	[20.6 (5.7-90.2)]		
Tiwawech *et al.* (2008) Thailand	75 cases of histologically confirmed NPC	44 age-matched controls (20 healthy controls and 24 non-NPC patients with cancer or other disease)	EBV *EBNA2* and *LMP1* subtype by PCR	*EBNA2* subtype			No	Sex distribution was different in cases and controls (69% male in cases vs 41% male in controls).
				Type1	72	1.0		
				Type2	3	[1.8 (0.1-96.2)]		
				LMP1 subtype				
				Wild-type	31	1.0		
				Deletion-type	44	[2.5 (1.1-5.8)]		

-, negative; +, positive