

Table 2.1. Case-control studies of chewing betel quid and cancer of the oral cavity published after IARC (1985)

Reference, study location and period	Organ site (ICD code)	Characteristics of cases	Characteristics of controls	Exposure assessment	Exposure categories	Relative risk (95% CI)*	Adjustment for potential confounders	Comments
Nandakumar <i>et al.</i> (1990) Bangalore, India, 1982-84	Oral cavity (exc base of tongue) (140, 141.1-9,145)	348 (115 men, 233 women) from Bangalore population based Cancer Registry, average age 54.8 years, 51/399 (13%) in the data base excluded for incomplete record; over 93% histologically confirmed	348 Population based selected among non cancer cases attending one hospital. Matched by age, gender & location	Interviewer-administered standardized questionnaire	Non chewer Chewer (M) Chewer (F) Chewer (M & F)	1.0 1.5 (0.6-3.8) 2.2 (0.7-6.5) 1.7 (0.9-3.5)	Risk of one factor was adjusted for the risks of other factors	
Wasnik <i>et al</i> (1998) Nagpur, India	Oropharynx	123 (men & women)	246 (men & women) 123 non-cancer patients and 123 patients with cancer from other sites		Non chewer Chewer	1 2.6 (0.9-7.1)	None	
Dikshit & Kanhere (2000) Bhopal, India 1986-1992	Oral Cavity 140, 141.1-.5, 143, 144, 145.0-.2, 145	148 (men)	260 community	Interviewer-administered standardized questionnaire	Non chewer Chewer	1 1.7(0.9-3.3)	Age, smoking	
Merchant <i>et al</i> (2000) Karachi, Pakistan 1996-1998	Oral Cavity	79 (both men & women) from 3 Hospitals	149 (both men & women, hospital based)	Interviewer-administered standardized questionnaire	Non chewer Chewer	1 9.9 (1.76-55.62)	Smoking, naswar, alcohol	
Balaram <i>et al</i> (2002) Southern, India 1996-1999	Oral Cavity	591 (309 men, 282 women) from 3 Hospitals	582 (292 men, 290 women) from Hospital out patients, relatives or friends accompanying patients attending same 3 hospitals (free from cancer)	Interviewer-administered standardized questionnaire	Non Chewer (M) Chewer (M) Non Chewer (F) Chewer (F)	1 4.2 (1.5-11.3) 1 16.4 (4.8-56.5)	Smoking, alcohol drinking Alcohol drinking	

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Znaor <i>et al</i> (2003) Chennai and Trivandrum, India 1993-1999	Oral Cavity Lip(140), Tongue (141) Mouth (143-5)	1563 men histologically confirmed	2638 men cancer patients (non-tobacco related cancers) & hospital visitors	Interviewer-administered standardized questionnaire	Non Chewer	1	Smoking and alcohol drinking	
					<i>Chewer</i>	2.2 (1.6-3.0)		
					All sites (oral) Tongue Mouth	1.7 (1.1- 2.6) 2.6 (1.8-3.7)		
Ko <i>et al</i> (1995) Kaohsiung Taiwan 1992-1993	Oral Cavity 140-141, 143-145	107 (104 men, 3 women) from 3 Hospitals	200 (194 men, 6 women) from Hospital out patients matched by age and gender	Interviewer-administered standardized questionnaire	Non Chewer Chewer (mixed) w/unripe betel fruit (inflorescence)	1 6.9 (3.1-15.2) 11.6 (3.7-36.9)	Smoking, alcohol drinking, education & occupation	A synergistic effect of betel quid, smoking and alcohol use was suggested. Types of betel quid: -areca nut + betel leaf -areca nut + betel fruit -mixed
Lu <i>et al</i> (1996) Changhua, Taiwan 1990-92	Oral Cavity	40 (34 men, 6 women) Histologically confirmed	160 (136 men, 24 women) Population based matched by age and gender	Interviewer-administered standardized questionnaire	Non Chewer Chewer	1 58.4 (7.6,447.6)	Smoking, alcohol drinking, age, gender, residence	
Chen <i>et al</i> (2002) Taichung 1994-97	Oral Cavity	29 histologically confirmed	29 outpatients and those negative for cancer on biopsy	(Medical records)	Non Chewer Chewer	1 17.1 (23-129.0)	Smoking, gender, age, HPV status	

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Thomas <i>et al</i> (2007) Papua New Guinea 1985-87	Oral cavity	143 (102 men, 41 women) from 6 Hospitals (6 provinces)	477 (342 men, 135 women) Hospital based excluding malignancies or relatives of admitted patients	Interviewer-administered standardized questionnaire	Non Chewer Chewer Quids/day Low Medium High	1 2.03 (1.01-4.09) 1.73 (0.78-3.84) 2.10 (0.98-4.47) 2.47 (1.13-5.40)	Age, sex, province, income, education & smoking	Betel quid without added tobacco
Subapriya <i>et al</i> (2007) Tamil Nadu, India 1991-2003	Oral cavity	388 (202 men, 186 women) squamous cell carcinoma One Hospital	388 age and sex matched relatives and friends of patients with other non-malignant diseases Interview response (77%)	Interviewer-administered standardized questionnaire	Non Chewer Chewer	1 2.23		Significant interaction with smoking and alcohol use.
Muwonge <i>et al</i> (2008) Trivandrum, India	Oral cavity	282 (163 men, 119 women) cases detected at a screening programme, histologically confirmed	1410 (815 men, 595 women) non cancer subjects from the same population	Interviewer-administered standardized questionnaire	Never chewed Chewer M Chewer F	1 3.3 (0.9-12.0) 5.4 (2.1-14.1)	Education, religion, smoking & alcohol drinking	Nested case-control analysis Significant interaction with smoking and alcohol use.

*CI, Confidence interval