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Risk of cancers associated with tobacco use in India: a systematic review and meta-analysis

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Background: Several studies on cancers associated with tobacco suggested that smokeless and smoking tobacco increases the risk of oral, lung, oropharynx, esophagus, larynx etc. No systematic review has been reported for evidence of consistent studies in India. Therefore, this study undertook a meta-analysis to quantify the overall risk of different cancer sites associated with various forms of tobacco use to investigate the risk variation in each site by different forms of tobacco in a systematic manner.

Methods: Analyses were carried out on 22 published studies with reported sample of cases and control among exposed and non-exposed with forms of tobacco. The pooled odds ratios for each cancer by forms of tobacco were calculated using random effects model.

Results: A significant association was found for oropharynx (OR=5.26; 95% CI: 2.28-12.14), hypopharynx (OR=3.36; 95% CI: 1.95-5.79), esophagus (OR=2.67; 95% CI: 2.06-3.47), larynx (OR=5.47; 95% CI: 4.01-7.46), lung (OR=5.07; 95% CI: 2.40-10.71) and oral (OR=1.95; 95% CI: 1.51-2.53)cancers among smoker, while among chewer, esophagus (OR=3.46; 95% CI: 2.83-4.22) and oral (OR=6.59; 95% CI: 5.18-8.39) cancer. Among bidi smoker, esophagus (OR=3.63; 95% CI: 2.41-5.45), lung (OR=5.92; 95% CI: 2.67-13.10) and oral (OR=2.85; 95% CI: 1.52-5.36) cancer were significant, whereas lung (OR=2.15; 95% CI: 1.22-3.78) cancer was significantly associated with cigarettes smoking. There was considerable heterogeneity in the pooled odd ratios among all the cancer sites associated with forms of smoking and chewing tobacco.

Conclusion: This study clearly indicates that smoking tobacco increases the risk of oropharynx, esophagus, hypopharynx, oral, larynx and lung cancer while chewing tobacco increases the risk of oral and esophagus cancer. The detailed information on quantum of associated additional risk may be incorporated into tobacco prevention and termination efforts particularly among widely prevalent regions in India.

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