CHAPTER VII

DISCUSSION AND CONCLUSION

Problem overview and etiologic importance

In Thailand , smoking behavior , especially n rural area , started early in the second decade of life. Men learned to smoke cigarette immediately after schooling year or during their military service at the age of 21 years. Hand - rolled tobacco was usually smoked in the beginning because of its lower cost and easier access as compared to commercial cigarettes. Manufactured cigarettes might replace hand - rolled tobacco in some occasions especially when people had social interaction or migrated into the urban district. Hand -rolled tobacco was classified as a high tar cigarette (28 - 40 mg tar).[10] It was postulated that long term exposure to this type of tobacco carried higher risk for laryngeal cancer as compared to other low tar (< 22 mg tar) commercial cigarettes.

The behavior of alcohol consumption in rural area was also interesting. Whisky was almost the only alcohol they drank most in that region. Local brewed whisky with diferrent alcohol concentration ranged from 28 to 40 degree (gram percent) was usually found in our study. Biologically , alcohol could exert a direct local effect , through its solvent properties or by its toxicity to epithelial respiratory enzyme systems. This could fascilitate the action of tobacco carcinogens on the target cell. Alcohol was also known to induce

microsomal liver enzyme capable of transforming proximate carcinogens into ultimate carcinogens.[38]

The crude odds ratio related to smoking in this study was 9.9 with 95% CI of 3.6 to 33.7. Only small differences were observed between the crude and adjusted smoking OR for laryngeal cancer. Adjusted OR after controlling alcohol consumption and some dietary factors was 8.9 with 95% CI of 2.8 - 28.6 Because of the high prevalence of smoking in case groups (91.6%), our estimated risk was slightly higher than that found in previous studies.[24,28,38] Hand - rolled tobacco accounted for some 50 percent of our current smokers. The risk effect for laryngeal cancer development in this type of tobacco was up to 16 folds as compared to non - smokers. The difference in risk effects between hand - rolled tobacco and commercial cigarettes was also noticed and it played a remarkable clinical significance. The estimated risks for hand - rolled tobacco and manufactured cigarettes after adjusting for alcohol consumption were 15.6 and 10.7 respectively.

An association with laryngeal cancer was also noted among ex - smokers. Ex-smokers included persons who had quit smoking one or more years prior to our study. However for those who had smoking abstinence for more than 15 years , they were considered to have an equal risk for laryngeal cancer as non - smokers [38,39]. Our data found the crude and adjusted odds ratio for ex-smokers to be 6.7 and 6.3, respectively. These also confirmed those of previous studies.[24,28,38] For former smokers , its estimated risk effect was 50% lower than current smokers.

Our study could demonstrate the increasing risk of laryngeal cancer with increasing amount of cigarettes smoked and duration of smoking. The odds ratio for persons who smoked more than one pack of cigarettes in our data, however, did not increase in the same direction with others because the number of cases and controls in this category were too small. Interestingly, all of our laryngeal cancer cases had more than 20 years smoking history. It seemed to suggest that smoking more than 20 years of tobacco, no matter the amount of tobacco smoked , had an increased risk for laryngeal cancer and this risk was nearly stable. To emphasize the importance of dose response association between smoking and laryngeal cancers accurately , a modified unit of tobacco year was applied to estimate this risk. Tobacco year unit was a result of multiplying the number of cigarettes consumed per day with number of smoking years. Since many smokers in our data smoked cigarettes differently by the number of cigarettes per day in different period of time , we calculated each period of smoking into tobacco year unit and then summed up together. It clearly showed a positive dose - response effects after adjusting for alcohol consumption and other factors in our data. Our results were in good agreement with other case - control epidemiologic investigations.[24,28,38]

Interaction between alcohol and smoking in elevating risk of laryngeal cancer had been addressed in many other reports but results were inconclusive.[20-22, 38,40,41] Alcohol consumption alone had the crude and adjusted OR of 4.9 (95% CI of 2.3 - 10.2) and 2.9 (95% CI of 1.3 - 6.7), respectively in our study. The marked difference between crude and adjusted odds ratio in alcohol factor confirms its dependent risk effect to smoking. In rural area, after all day work load , foods and alcohol were usually consumed together. Local whisky was usually the

only alcohol mentioned as their favorite drinks. It was difficult to quantitate the amount of alcohol per day accurately. Most alcohol consumers in our study were mild drinkers since more than 50% of them consumed less than 80 gram alcohol per day and the number of current drinkers were only 30% in cases and 12% in controls. So, the result was not able to compare with other studies [20-22,24] which liqour, wine and beer were predominantly mentioned and the amount of alcohol usage was much higher than our study subjects.

However, the OR for regular drinkers (both current and former drinkers) demonstrated a positive dose response related to laryngeal cancer. The adjusted OR for laryngeal cancer in association with smoking and alcohol consumption was also impressive. Although most of our drinkers were mild drinkers, it showed an increasing trend for OR from non-smokers to current smokers in both never and ever alcohol consumers. Because of mild alcohol consumption, it was not possible to categorize alcohol into gram per day strata due to statistical problem and the number of cases and controls in each cell was too small to detect any significance This same problem was also seen in those one pack per day smokers and drinkers groups which had only 4 cases and 4 controls in this category.

Occupational risk for laryngeal cancer was documented in many studies. [24,25,28,42] A number of risk substances from the industry such as Nickel, asbestos and wood dust were not found in our study. Actually, over 50 percent of our cases and controls had agriculture and non - skilled employment job title. Therefore, our data showed no association between occupations and laryngeal cancer. For truck drivers, the number in both cases and controls were too

small to detect any certain risk for laryngeal cancer. To emphasize their association in this cancer clearly , further research question should be set and a larger sample size is needed.

Consumption of fruits , vegetables and carotene - containing foods were reported to reduce the risk of laryngeal cancer in some study.[28] , but it was difficult to evaluate potential risk effects of these factors in our hospital control subjects. Our study showed a statistically non- significance of the risk effect of all dietary factors.

Limitation

Since our study was a hospital - based case control study. It was inevitable to due with nonrepresentativeness of study population arising from different referal patterns to a tertiary care institute and the use of a diseased comparison group might share common exposures with cases. This could bias the odds ratio toward unity. There might also be some recall bias in our study since most patients in our study were in the sixth and seventh decades having a long exposure of substance at risk history. As mentioned above , our cases and controls were recruited from the central and northeast of Thailand. It was not able to generalize this finding to the whole country especially to the north where people had high propotion of smoking habit and the result might not be able to compare with community - based study.

Conclusion

Our current study showed that smoking had a strong association with laryngeal cancer. Its risk estimate was 8.9 folds as compared to non-smokers. Hand - rolled tobacco had a higher risk effect than commercial cigarettes. (adjusted OR = 15.6 VS 10.7) It was also clearly shown that the risk of laryngeal cancer increased with the amount and duration of smoking but declined in those who quit smoking.

Interaction between cigarettes smoking and alcohol consumption in relation to laryngeal cancer was also documented in our study. The synergistic effect of both factors was consistent with previous reports. Therefore , all strategies for alcohol and tobacco cessation both legally and morally should be immediately reinforced in our community.