

Environmental Factors and Lung Cancer among Nonsmokers:

A Case Study of Bangkok

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Extended Abstract

The association between risk factors and lung cancer has been investigated by many researches and several reviews have been published in the recent years. A consistent excess of lung cancer observed among urban residents has been cited as evidence that air pollution contributes to lung cancer (Pope III et al., 2002). The environmental factors included physical and social environmental factors such as residential exposure to outdoor air pollution and sources of emission as well as occupational exposure and environmental tobacco smoke

(Barbone et al, 1996; Droste et al., 1999; Benedetti et al., 2001). However, the relationship between risk of lung cancer and environmental factors could be established if the differences in smoking behavior were adequately controlled (Howe and Keller, 1993).

As air quality in Bangkok Metropolis has been severely degradation particularly particulate matter (Bangkok Metropolitan Administration and United Nations Environment Program, 2001) and lung cancer has become the major cause of death among the other types of cancers in Thai population (Deerasamee et al., 1999). The purpose of this study was to examine the possible environmental factors for lung cancer among nonsmokers who were Bangkok residents and diagnosed between 1996 – 2000 at The National Cancer Institute. The data was drawn from the survey of ‘ Air Pollution and Lung Cancer: A Case Study of Bangkok Residents’ which was conducted by Institute for Population and Social Research, Mahidol University in 2001. A total of 40 nonsmoking and primary lung cancer cases were retrieved and compared with 121 nonsmoking general population. Subjects were classified as nonsmokers as they had never smoked during their lifetime. Retrospective data on various aspects of environmental tobacco smoke,

residential exposure and occupational exposure were assessed by unconditional logistic regression models. The residence in Bangkok was considered as a surrogate indicator of exposure to air pollution by geographical information system (GIS) applying for computerized estimation of the level of PM10 ($\mu\text{g}/\text{m}^3$) by given the annual average of the level of PM10 from the closest air monitoring station as the exposure at the residence. Then the residential exposure was classified into heavily and not heavily polluted area.

The results showed that 33.3 and 66.5 per cent of nonsmoker were males and females with an average age of 61 and 59 years and duration of residence of 47 years. The risk was increased significantly for those who were females (OR=6.6, 95%CI= 2.3– 7.5) compared to males, The risk was increased for those who lived in heavily polluted area (OR=1.3, 95%CI=1.12 – 4.2) compared to those who lived in not heavily polluted area. The elevated risk was also for those who reported living close to main road within 200 m-radius (OR=8.1, 95%CI=3.8– 14.4), and also living close to factory less than 1 km (OR=3.8, 95%CI=1.6-4.3) compared to those who lived further than 2 km. The Significant increased risk was also observed for factory workers (OR =

2.1, 95%CI = 1.8 – 7.5) and indoor workers (OR = 2.3, 95%CI = 1.8 – 6.2) who exposed to fume or VOCs compared to house person. The risk was also associated with environmental tobacco smoke exposure during working lifetime (OR = 1.1, 95%CI = 1.02 – 4.04).

This work suggested that in the absence of smoking, the environmental factors especially occupational and residential exposure are contributed substantially to the occurrence of lung cancer in nonsmoking Bangkok residents. Although the elevated risk of lung cancer was quite low when the residential exposure and the environmental tobacco smoke in workplace were considered, the data suggested that air pollution is a contributing risk factor of lung cancer. Further study of the association between environmental factors and lung cancer among nonsmokers with larger sample should be conducted.

Key words: Environmental Factor, Lung cancer, Nonsmoker

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