

ASSOCIATIONS BETWEEN FEMALE LUNG CANCER MORTALITY AND NO, NOX, AND NO2 IN KAOHSIUNG, TAIWAN

Shu-Yuan Chen, *Tzu Chi University, Taiwan (ROC)*

Chieh-Wen Chen, *Tzu Chi University, Taiwan (ROC)*

Yao-Chin Wang, *Tzu Chi University, Taiwan (ROC)*

Jen-Feng Yeh, *Tzu Chi University, Taiwan (ROC)*

Tzu-Chi Chiu, *Tzu Chi University, Taiwan (ROC)*

Background and Aims: Cancer and heart disease were the first and second leading causes of death and lung cancer was the most common cancer death in Taiwan. We investigated the associations between mortality from lung cancer and heart disease and long-term levels of PM10, SO2, CO, O3, NO, NOx, and NO2 in an industrial southern Taiwan city, Kaohsiung.

Methods: Our study areas were 11 townships which housed a continuous fixed-site air pollution monitoring station affiliated with Environmental Protection Administration each in Kaohsiung. Age standardized mortality rates in each township from 2007 to 2009 were obtained from Department of Health. Air pollution levels of each station were estimated from 2007 to 2009 (concurrent exposure), 2002 to 2004 (exposure of 5 years ago), 1997 – 1999 (10 years), and 1993 to 1995 (14 years), 4 exposure periods in a total. Three-year mean data were used in analyses. Pearson's correlation coefficients between mortality and pollutions were estimated.

Results: Declined trends of all pollutions but O3 were found from 1993 to 2009. High polluted townships were consistently higher than others during the 14 years. O3 was inversely related to others during 4 exposure periods. Female lung cancer mortality rates were significantly positively associated with concurrent CO ($r = 0.69$), and NO, NOx, and NO2 from 4 exposure periods with r ranged from 0.61 – 0.81, while negatively associated with O3 from 3 exposure periods. However, there were no significant linear correlations between male lung cancer mortality rates and pollutions. Nor were the linear correlations between both male and female heart disease mortality rates and pollutions.

Conclusions: Positive associations between female lung cancer mortality and NO, NOx, and NO2 shone line on the etiology of female lung cancer with low prevalence of cigarette smoking in Taiwan. Further studies to clarify these relationships were needed.