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Title: Effects of differences in exposure conditions on pulmonary functions

Mr. Tsuyoshi 5143 Nishinakagawa nisituyo0217@yahoo.co.jp [1], Prof. Hideaki 5144 Senjyu senjyu@nagasaki-u.ac.jp MD [1], Mr. Masaharu 5145 Asai asaichan@bc.mbn.or.jp [1] and Ms. Takako 9202 Tanaka tanakataka@nagasaki-u.ac.jp [1]. [1] Medical Science, Graduate School of Biomedical Sciences, Nagasaki University, Nagasaki, Japan .

Body: Introduction Air pollution due to industrial waste and tobacco smoke has a serious detrimental influence on pulmonary functions. However, few reports have been published regarding the effects of differences in exposure conditions on the pulmonary functions. Aims and objectives The objective of this study was to examine how the differences in exposure conditions affect the pulmonary functions. Methods The subjects consisted of 869 people presented with functional decline as a result of working or living in an area with air pollution, and 434 people participated in an epidemiological investigation in an area without air pollution. Reviews of pulmonary function tests were conducted by employing the medical examination data. Pulmonary functions were compared in smokers versus non-smokers in the area with pollution (smokers with pollution vs. non-smokers with pollution) and were also compared to smokers in the non-polluted area (smokers without) and non-smokers in the non-polluted area (non-smokers without). Results In terms of the %VC, the values were 90.9%, 95.9%, 98.2%, and 97.4% in the smokers with pollution, non-smokers with pollution, smokers without and non-smokers without, respectively. For the FEV_1%, the value for smokers with pollution was 65.2%, non-smokers with pollution was 70.1%, smokers without was 70.8%, and non-smokers without was 79.2%. The smokers with pollution had a lower FEV_1% than the other groups ($p<0.001$). Conclusions Air pollution and tobacco smoke exposure are associated with reduced VC and FEV_1. In particular, exposure to both factors had a stronger effect on the FEV_1 than did exposure to one factor. Therefore, active smoking cessation instruction is necessary for subject in the polluted area.