

Association of PM10 and PM2.5 exposure with respiratory health of the children living near palm oil mill, Dengkil

ABSTRACT

Waste and by-products from palm oil trees are versatile and can be used as biomass fuel, but the processes of producing electricity by using low pressure boilers are causing air pollution. The objective of this study is to determine the association between PM10 and PM2.5 exposure with respiratory symptoms and lung function among children living near to palm oil mill. A cross-Sectional comparative study was carried out among school children at Dengkil and Kerling. Questionnaires adopted from ATS-DLD-78-C were distributed to the respondents' parents. PM10 and PM2.5 was measured. Lung function of the respondents was evaluated by using Chest Graph Spirometer; results were compared with standards of lung function, by ATS (1991). There was a significant difference for Mean±SD PM10 and PM2.5 in studied and comparative area, ($p < 0.05$). There were significant association between PM10 with wheezing and cough (PR=5.220, CI%=1.030-26.453) and (PR=3.289 CI%=1.074-10.072). The study indicates that the lung function of; FEV1 % ($t = -4.54$, $p = 0.001$) and FEV1/FVC % ($t = -7.00$, $p = 0.001$) were lower among studied group compared to the comparative group. Results also showed that there is a significant inverse correlation between PM2.5 and FVC% ($r = -0.352$, $p = 0.0226$). The need for palm oil mill management to evaluate the effectiveness of their implemented control measure seems to be very important, as black soot emitted from boilers stack is believed to contain high level of. The high efficiency biomass boiler and the used of fabric filters should be considered if the implemented control measure is not functioning effectively.

Keyword: PM10; PM2.5; Children; Respiratory symptoms and lung function