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Title: Liquefied petroleum gas associated airflow obstruction in manual cigarette lighter refilling workers

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Body: Background: Manual gas cigarette lighter refilling with butane/propane liquefied petroleum gas (LPG) is a common low-income occupation in India. This includes devices intended to be disposable. Although this job task releases LPG in the worker's breathing zone, the respiratory effects of this occupation have not been studied. Methods: We studied 105 exposed LPG refillers (mean age 40.7±7.2 years) and 72 referents (42.3±10.2 years). We quantified exposure based on reported average daily use of LPG (mean exposure among refillers (56.4±24.5 ml) and performed routine spirometry. We compared age, height, ever smoking, forced expiratory volume in one sec (FEV_1), forced vital capacity, (FVC), and FEV_1/FVC ratio for exposed vs. referents using the Mann-Whitney U test. Multiple linear regression models estimated the LPG exposure response (daily use, mls) within the group of refilling workers, adjusting for age, height, and smoking status. Results: There were no statistically significant differences in age, height or smoking between exposed and referents. Exposed vs. referent status was associated with a 160 ml FEV_1 decrement (2.40±0.3 vs. 2.24±0.3 L; $p<0.05$) and a 3% difference in FEV_1/FVC (both $p<0.05$), but a 90 ml, non-significant difference in FVC. Among the exposed, there significant decrements in FEV_1 (100±25 ml), FVC (50±25 ml) and FEV_1/FVC (2.5%) scaled per 1 SD in daily LPG use ($p<0.05$ for each). Conclusion: Use of LPG as a fuel during manual gas lighter refilling is associated with airflow obstruction. This could represent an acute or chronic LPG-mediated effect. Clinical Relevance: Excess exposure to LPG should be assessed as a potentially preventable risk factor for airway disease.