

Air Pollution Exposure Among Adult Chronic Airway Disease Patients in the Gambia: A Pilot Case-control Study

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Background: Chronic Airway Diseases (CADs) are of public health importance in both the developed countries and Low-and-middle-income countries (LMICs). Air pollution has a role in the causation of CADs and the worsening of already established CADs. This study examines the extent to which adult CAD patients and age and sex-matched controls in The Gambia are exposed to fine particulate matter and carbon monoxide. **Methodology:** In a clinic-based pilot case-control study, 50 adult patients with diagnosis of asthma or COPD presenting at respiratory clinics in the Western Health region in The Gambia were consecutively recruited along with 50 age and sex-matched controls who presented for non-cardiorespiratory conditions. Baseline spirometry, clinical examination and chest x-ray were done alongside the questionnaire administration. Home and personal PM_{2.5}, CO and Exhaled CO were subsequently measured. **Results:** The median (SD) age of cases was 51.5±26 years and controls 52.0±24.8 years. Most cases were urban dwellers, presented with wheeze, cough, shortness of breath and weight loss. Two-thirds (25/40) of the asthmatics had a poor asthma control test score, whilst 90% (9/10) of the COPD patients had CAT scores showing at least a medium impact on their lives. Three-quarters (21/50) of cases had ≥1 exacerbation in the previous year. Passive smoking occurred in one-quarter of the cases. There is slightly more personal and home exposure to PM_{2.5} among controls (61.2µg/m³) than cases (51.8µg/m³). Controls had slightly more home CO exposure 71.2 µg/m³ compared to cases (65.2 µg/m³). Cases have more personal CO exposure as the controls. Also, occupational dust exposure and exposure to burning refuse occurred among the cases. **Conclusion:** As compared with controls, Chronic airway disease patients in The Gambia, present with significantly advanced disease, are likely to have had at least one exacerbation in the last year, and are exposed to personal CO, second-hand smoke, occupational dust and burning refuse. There is need for concerted efforts among all stakeholders to reduce such exposure, thus preventing worsening of already established

CAD.

Characteristics	Cases n (%)	Controls n (%)	Total N (%)	p-value
PM_{2.5} (Personal)				
>50 µg/m ³	24(48)	24(48)	48(48)	0.595
26-50 µg/m ³	22(44)	19(38)	41(41)	
≤25 µg/m ³	04(08)	07(14)	11(11)	
PM_{2.5} (Home)				
>50 µg/m ³	15(30)	16(32)	31(31)	0.647
26-50 µg/m ³	28(56)	24(48)	52(52)	
≤25 µg/m ³	07(14)	10(20)	17(17)	
PM_{2.5} (Personal)				
Minimum	1.14	1.65	-	-
Maximum	125.8	167.0	-	-
Mean/Average	51.8	61.2	-	-
Median	49.2	47.7	-	-
Interquartile range (IQR)	35.4	44.8	-	-
PM_{2.5} (Home)				
Minimum	3.48	6.74	-	-
Maximum	159.8	173.6	-	-
Mean	45.6	48.2	-	-
Median	39.4	37.0	-	-
Interquartile range (IQR)	22.1	26.4	-	-
CO (Personal) ppm				
Minimum	0	0	-	-
Maximum	280	480.5	-	-
Mean	47.0	16.2	-	-
Median	28.8	41.5	-	-
Interquartile range (IQR)	42	122.5	-	-
CO (Home) ppm				
Minimum	0	0	-	-
Maximum	328.5	310.5	-	-
Mean	65.2	71.2	-	-
Median	36.8	39.3	-	-
Interquartile range	61.6	89.0	-	-
Exhaled CO				
Minimum	1.0	2.0	-	-
Maximum	8.0	13.0	-	-
Mean	3.0	3.6	-	-

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