

» Step 4 of 4: Abstract Preview and Submission

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Abstract Submitter: Mrs Felber Dietrich Denise - denise.felber@unibas.ch

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Title: Long-term exposure to NO₂ and heart rate variability: results from the SAPALDIA study

Evaluation Topic: 06.14 - Environment / Pollution

Acronym Abbreviation: SAPALDIA

Acronym: Swiss Cohort Study on Air Pollution and Lung Diseases in Adults

On Behalf of: SAPALDIA Team

Category: Bedside

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Abstract Authors

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Abstract Content**100%****Background**

Heart rate variability (HRV) is a measure of cardiac autonomic tone and has been associated with cardiovascular morbidity and mortality. Short-term studies have shown that subjects exposed to higher traffic associated air pollutant levels have lower HRV.

Objective

To investigate the effect of long-term exposure to NO₂ on HRV in the SAPALDIA cohort study.

Methods

24-hour ECGs were recorded in randomly selected SAPALDIA participants aged ≥50. Other examinations included an interview investigating health status and measurements of blood pressure, body height and weight. Exposure to NO₂ at the address of residence was predicted by hybrid models (i.e. a combination of dispersion predictions, land-use and meteorological parameters). The association between annual exposure to NO₂ and HRV was estimated in multivariable linear regression models. Complete data for analyses was available for 1408 subjects.

Results

For women, but not for men, each 10 µg/m³ increment in 1-year averaged NO₂ level was associated with a decrement of 3% (95% CI, -4--1) for SDNN, -6% (95% CI, -11--1) for night-time LF, and -5% (95% CI, -9-0) for night-time LF/HF. In subjects with cardiovascular problems* SDNN decreased by 4% (95% CI, -8--1) per 10 µg/m³ increase in NO₂.

Conclusions

These results support the hypothesis that long-term exposure to NO₂ is associated with cardiac autonomic dysfunction in elderly women and in subjects with cardiovascular problems.

Regression coeff. of exposure to NO₂

Outcome variable	Women (n=725)		Men (n=683)		Cardiovascular problems (n=236)		No cardiovascular problems (n=1172)	
	Coefficient	p	Coefficient	p	Coefficient	p	Coefficient	p
ln(SDNN)	0.0008	0.946	-0.0256	0.012	-0.0437	0.021	-0.0049	0.578
ln(Total Power)	0.0137	0.617	-0.0545	0.074	-0.837	0.047	-0.0046	0.843
ln(HF)	0.0131	0.759	-0.005	0.910	-0.0523	0.460	0.0299	0.403
ln(LF)	0.0046	0.882	-0.0347	0.261	-0.0579	0.257	0.0010	0.970
ln(LF/HF)	-0.0079	0.768	-0.0253	0.317	-0.0056	0.907	-0.0267	0.240

Adjusted for age, body mass index, hypertension, exercise, betablocker, uric acid, self reported diabetes, smoking status, educational level and random area effects. - NO₂ averaged over previous year. - ln: Natural logarithm; SDNN: Standard deviation of all normal-to-normal RR intervals; HF: High frequency power; LF: Low frequency power; *Cardiovascular problems: subjects who had a medical examination or treatment because of cardiovascular problems in the previous 12 months