

Vascular Changes in Workers Exposed to Carbon Disulfide

L Braeckman,*^{MD, PhD}, K Kotseva,**^{MD, PhD}, D Duprez,***^{MD, PhD}, D De Bacquer,****^{MSc, PhD}, M De Buyzere,⁺^{MSc},
N Van De Veire,⁺⁺^{MD}, M Vanhoorne,⁺⁺⁺^{MD, PhD}

Abstract

Aim: To assess the effects of occupational exposure to carbon disulfide (CS₂) concentrations below the threshold limit value (31 mg/m³) on the structural and the functional properties of the arteries, heart rate, blood pressure and lipids. **Methods:** Study subjects were 85 male workers in the viscose industry and 35 men without such exposure. The CS₂ concentration was determined by personal active sampling. From the common carotid artery diameter, the change in diameter (echography) during the heart cycle and the pulse pressure, local arterial distensibility and compliance were calculated. Global large and small artery elasticity were calculated from registrations of radial artery waveforms. Simultaneously, heart rate and blood pressure were recorded and blood samples were collected for lipid measurements. **Results:** CS₂ concentrations ranged from 2.34 to 32.4 mg/m³. No significant effect of CS₂ on blood pressure, total cholesterol, HDL and LDL cholesterol or triglycerides was found. Among the vascular parameters under study, common carotid artery distensibility was significantly lower, and heart rate significantly higher in exposed workers compared to controls. The differences remained significant after adjustment for age, body mass index, smoking habits, alcohol consumption, heart rate and systolic blood pressure. Common carotid artery intima media thickness and global arterial indices did not differ significantly between the two groups. **Conclusions:** Exposure to CS₂ under the current level may already cause alterations in common carotid artery elastic properties in apparently healthy individuals. Even before biochemical and clinical findings occur, important functional changes in the vessel wall were observed, at least in some vascular territories.

Ann Acad Med Singapore 2001; 30:475-80

Key words: Arterial compliance, Arterial distensibility, Carbon disulfide, Carotid artery, Heart rate, Intima media thickness

* Doctor-assistant

** Postdoctoral Fellow

*** Statistician

+++ Professor, Head of the Section of Occupational Health
Department of Public Health
Ghent University, Belgium

*** Professor, Head of the Vascular Laboratory

+ Research Fellow

++ Research Assistant

Department of Cardiology and Angiology
Ghent University Hospital, Belgium

Address for Reprints: Dr Lutgart Braeckman, Department of Public Health, Block A, 2nd Floor, De Pintelaan 185, B-9000 Gent, Belgium.

E-mail: Lutgart.Braeckman@rug.ac.be