Title *

**The acute pulmonary and prothrombotic effects of cerium oxide nanoparticles following intratracheal instillation in mice**

Abstract *

Cerium oxide nanoparticles ($CeO_2$ NPs), used as a diesel fuel catalyst, are emitted into the ambient air resulting in human exposure by inhalation. Recent studies reported the development of lung toxicity after exposure to $CeO_2$ NPs. However, little is known about the thrombotic effects of $CeO_2$ NPs. Here, we investigated, in mice, the acute (24 h) effect of intratracheal instillation of either $CeO_2$ NPs (0.1 or 0.5 mg/kg) or saline (control) on pulmonary and systemic inflammation and oxidative stress and thrombosis. $CeO_2$ NPs induced an increase of neutrophils into the bronchoalveolar lavage (BAL) fluid with elevation of tumor necrosis factor α (TNFα) and a decrease in the activity of catalase. Lung sections of mice exposed to $CeO_2$ NPs showed a dose-dependent infiltration of macrophages and neutrophils. The plasma levels of C-reactive protein and TNFα were increased whereas the activities of catalase and total antioxidant were decreased. Interestingly, $CeO_2$ NPs dose-dependently enhanced thrombosis in pial arterioles and venules. Moreover, the plasma concentrations of fibrinogen and plasminogen activator inhibitor-1 were elevated by $CeO_2$ NPs. The direct addition of $CeO_2$ NPs to mouse whole blood *in vitro* neither caused platelet aggregation nor affected prothrombin time or partial thromboplastin time, suggesting that the thrombotic events observed *in vivo* may have resulted from systemic inflammation and/or oxidative stress induced by $CeO_2$ NPs. We conclude that acute pulmonary exposure to $CeO_2$ NPs induces pulmonary and systemic inflammation and oxidative stress, and promotes thrombosis *in vivo*.

Permission to publish *

☑ Check this box to give us permission to publish your abstract on a flash drive/USB Stick for distribution to all delegates if it is accepted for presentation

Affiliations and Authors *

Author Information
Abderrahim Nemmar (Presenting)

Affiliations
United Arab Emirates University, College of Medicine and Health Sciences, Department of Physiology, Al-Ain, UAE

Author Information
Suhail Al-Salam

Affiliations
United Arab Emirates University, College of Medicine and Health Sciences, Department of Pathology, Al-Ain, UAE

Author Information
Sumaya Beegam

Affiliations
United Arab Emirates University, College of Medicine and Health Sciences, Department of

Physiology, Al-Ain, UAE

Author Information
Priya Yuvaraju

Affiliations
United Arab Emirates University, College of Medicine and Health Sciences, Department of Physiology, Al-Ain, UAE

Author Information
Badreldin H Ali

Affiliations
Sultan Qaboos University, College of Medicine & Health Sciences, Department of Pharmacology and Clinical Pharmacy, Muscat, Oman