

## Rhinosinusal polyposis and metals: morphological aspects

Yolande Asara<sup>1</sup> - Roberto Madeddu<sup>1</sup> - Andrea Melis<sup>2</sup> - Laura Deluca<sup>2</sup> - Paolo Castiglia<sup>1</sup> - Juan Antonio Marchal<sup>3</sup> - Maria Alessandra Sotgiu<sup>1</sup> - [Andrea Montella](#)<sup>1</sup> - Pasquale Bandiera<sup>1</sup>

<sup>1</sup>Department of Biomedical Sciences, University of Sassari, Sassari, Italia – <sup>2</sup>ENT Clinic – Department of Surgery, Microsurgery and Medical Sciences, University of Sassari, Sassari, Italia – <sup>3</sup>Department of Human Anatomy and Embryology, Faculty of Medicine, University of Granada, Granada, Spagna

Metals have strong toxic effects in humans and can act as immunoregulatory factors. The purpose of our study was to determine whether the concentrations of metals are associated with the clinical course of nasal polyposis (NP). We measured the concentrations of 10 metals (Zn, Mn, Se, Fe, Cr, Ni, Pb, Al, Cd, and Cu) in 58 patients with NP, and 29 controls with a healthy nasal mucosa. We used electron microscopy to compare the ultrastructural features of the nasal mucosa between NP patients and healthy controls. Concentrations of metals in nasal polyps and healthy mucosa were determined by mass spectrometry. Transmission electron microscopic (TEM) and scanning electron microscopic (SEM) images of the nasal mucosa were obtained. The mean tissue concentrations of all 10 metals were significantly lower in NP patients than in healthy controls ( $P < 0.001$ ). Tissue concentrations of each metal were lower in stages III and IV NP than in stages I and II NP, although the differences were not statistically significant. TEM and SEM revealed changes in the mucosal ultrastructure in NP with progression from isolated polyposis (stages I and II) to massive polyposis (stages III and IV) with progressive fibrosis, devascularisation, and inflammation. Tissue concentrations of metals were lower in NP patients than in healthy controls, and this was particularly evident in massive polyposis. Polyp structure could contribute to the lower concentrations of metals by exposing the tissue to increased oxidative stress.

### Keywords

---

Metals; nasal polyposis; TEM; SEM.