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Stem cell characteristics in Polyposis nasi
M. Könnecke¹, R. Böscke¹, R. Pries¹, B. Wollenberg¹

¹University Hospital of Schleswig-Holstein, Campus Luebeck, Department of Otorhinolaryngology, Lübeck, Germany

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Background: Chronic Rhinosinusitis with Nasal Polyps (Polyposis nasi) is a chronic inflammatory disease of the upper airway with polyps extending from the middle meatus or ethmoid into the nasal cavity. Symptoms include nasal congestion, chronic rhinorrhea, hyposmia and facial headache. Histologically, the polyps are characterized by a highly edematous stroma and infiltration of inflammatory cells. Several hypotheses have been put forward regarding the underlying mechanisms including chronic infection, aspirin intolerance, epithelial disruptions, allergies and alteration in aerodynamics with trapping of pollutants. The underlying molecular mechanisms of the benign cell progression and the chronic recurrent nature of nasal polyps are still unknown. In parallel to the development and progression of malignant tumors, we postulate that the chronic growth of nasal polyps could be promoted by the activation and recruitment of a pool of tissue stem cells.

Methods: Total RNA from nasal polyps was isolated and a cDNA library was synthesized. Polymerase chain reaction (PCR) was performed in order to detect stem cell markers like CD133, Nestin, ABCG2 and Sox2. Cryostat sections of nasal polyps were prepared and stained against various stem cell marker proteins, such as Oct4, using immunohistochemistry (IHC).

Results: Using PCR we were able to detect the expression of the specific stem cell markers CD133, Nestin, ABCG2, Sox2. Furthermore, immunostaining revealed the existence Oct4-positive cells in nasal polyp tissue.

Conclusions: Our data strongly suggest the existence of cells with stem cell characteristics. We postulate that these cells are involved in the development and progression of Polyposis nasi. Further investigation of the role of stem cells in nasal polyps could allow for innovative rudiments for future treatment strategies.