Novel approach for a non-invasive diagnosis of chronic rhinosinusitis with nasal polyps

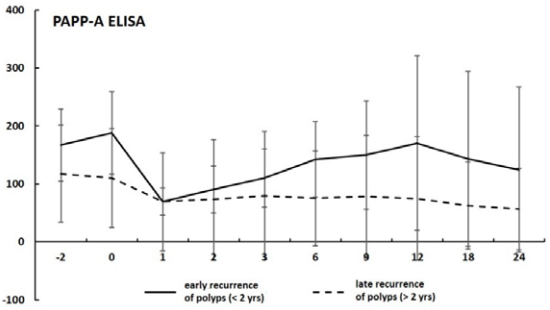
Reference No: B78106

CHALLENGE

As one of the most common chronic diseases worldwide and with a prevalence of approx. 10-15% of the population in developed countries, **chronic rhinosinusitis (CRS)** is the cause of significant costs to health systems and economies. Typical symptoms include a blocked nose, a persistent pressure in the paranasal sinuses and a continuous discharge of thin nasal mucus fluid. As a subtype, **chronic rhinosinusitis with nasal polyps (CRSwNP)** presents with a persistent expansion of the epithelium lining the inner nose. These fleshy swellings are believed to arise due to **chronic inflammatory processes** in the nasal mucosa. Patients often present with comorbidities such as asthma and suffer from recurring infections and a loss of smell. The molecular mechanism of this aberrant proliferation remains unclear making CRSwNP difficult to treat. Although symptoms can be alleviated trough surgical removal and intranasal administration of steroids, the recurrence rate is high. Diagnostic procedures include **uncomfortable endoscopic tissue examinations** of the nasal mucous membrane as well as **laborious and cost-intense CT scans**. For this reason, there is a great need for a less subjective and more reliable diagnosis of CRSwNP to start treatment as fast as possible.

INNOVATION

Here, we present the protease **Pappalysin-A (PAPP-A)** as a novel biomarker for the non-invasive diagnosis of CRSwNP. PAPP-A is **significantly upregulated** in polyp tissues and can be easily purified from exosomes in nasal mucus samples or whole mucus as well as blood samples. Importantly, mucus retrieval is a **non-invasive procedure** and detection of PAPP-A is possible with **commercially available kits (ELISA).** In combination with other measured biomarkers, PAPP-A provides a **unique and reproducible biosignature** outperforming previous diagnostic methodologies. Moreover, its expression can also mirror **disease progression** and **predict early recurrences.** Additionally, PAPP-A can **indicate response rate** to steroids during treatment course.



Samples from **66 CRSwNP patients** measured over a period of 2 years **after sinus surgery** (t=0). PAPP-A mirrors the course of the disease and distinguishes between **rapidly recurring** and **stable** disease groups. x-axis = months, y-axis = PAPP-A concentration (pg/mL).

COMMERCIAL OPPORTUNITIES

- **Polyp-specific** diagnostic marker for CRSwNP
- Patient-friendly and **non-invasive** detection using commercial kits, e.g. ELISA
- Correlation with polyp growth enables more **reliable disease monitoring**

DEVELOPMENT STATUS

Proof-of-concept in large patient cohort.

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