Clinical utility of circulating tumor HPV16 DNA detection in plasma from oropharyngeal squamous cell carcinoma patients

**BACKGROUND**

- Human papillomavirus-driven (HPV) oropharyngeal cancers (OPC) often have a favourable prognosis. Yet, ~25% of cases can develop recurrence or distant metastasis.
- Current clinical monitoring methods often fail to detect asymptomatic lesions, delaying salvage treatment and reducing chances of a cure.
- We are exploring the clinical value of measuring circulating tumour HPV DNA (HPV ctDNA) in HPV-driven OPC patients to guide outcome stratification and improve disease monitoring.

**METHODS**

- We used droplet digital PCR (ddPCR) to measure HPV16 ctDNA levels in baseline plasma samples from:
  - HPV16 seronegative controls
  - HPV16 seronegative OPC patients
  - HPV16 seropositive OPC patients
- Findings were tested for associations between HPV16 ctDNA status/levels and patient clinical information.
- Samples were collected in South America and Europe and are part of the HEADSpAcE study coordinated by the International Agency for Research on Cancer (IARC).

**RESULTS**

- Among patients with small volume disease (cT1/T2 N0), 11/12 tested positive for HPV16 ctDNA, and levels increased with clinical N (p=0.01) and stage (p=0.0029).
- Baseline HPV16 ctDNA detection was associated with a reduced risk of death (HR=0.3; p=0.03) and disease relapse (HR=0.2; p=0.028).

**CONCLUSIONS**

- Plasma HPV16 ctDNA detection by ddPCR showed high accuracy in OPC cases from Europe and South America.
- HPV16 ctDNA levels/status in baseline plasma were linked to disease volume and a reduced risk of relapse and death, indicating its potential for patient outcome stratification.
- Future research will focus on testing HPV16 ctDNA in post-treatment plasma samples to improve monitoring of minimal residual disease during surveillance.