RESEARCH SUMMARY – ViSON Study

Breath Volatile Organic Compounds as Biomarkers in Squamous Oesophageal Neoplasia

BACKGROUND:

Oesophageal Squamous Cell Carcinoma (OSCC) is a cancer of the food pipe that affects around 1500 patients every year. It is often detected at an advanced stage, resulting in poor survival (5-year survival less than 20%). Early detection can improve survival (5-year survival >70%). Therefore, early detection is vital to improving survival.

There are no national screening guidelines, and an endoscopy (A camera test to look at the food pipe) is the only available test to detect OSCC.

Early detection of OSCC is challenging for many reasons. Firstly, early disease symptoms are non-specific, which patients often overlook. Secondly, 'Alarm' symptoms such as weight loss, difficulty swallowing or vomiting blood are signs of advanced stage. Lastly, endoscopy is an invasive test with associated risks and significant discomfort.

Our proposed solution is a breath test for patients who have non-specific symptoms. Breath testing has ideal characteristics for a triage test because it is a non-invasive, simple to perform, quick and cost-effective test which can be offered by the GP and is acceptable to patients. The test is based on identifying volatile organic compounds (VOCs, small molecules) produced by the cancer.

The breath test will be offered by GPs to patients with symptoms. Those who test positive will be referred for an urgent camera test, and those who test negative will be reassured.

AIMS of RESEARCH: To develop a breath test to detect OSCC.

DESIGN and METHODS:

This study will be conducted in multiple NHS hospital sites across the UK. We will perform breath testing in patients who (i) have been referred by their GP for a camera test to look at their food pipe, and (ii) have been diagnosed with OSCC and waiting to start treatment.

Eligible patients will be contacted by members of the research team and asked to fast for at least 4-hours prior to testing. During the test, patients will blow air into a breath collection bag which is attached to a pump that transfers the breath molecules (VOCs) onto storage tubes.

The analysis of the breath samples will be performed at the specialist mass spectrometry lab in Hammersmith Hospital, London. We will identify the OSCC specific molecules in the patients' breath.

DISSEMINATION:

The results will be disseminated through:

1. Scientific papers and journal reports
2. National and international conference presentations (by researchers and members of project advisory group)
3. Public-facing areas such as GP practices and focus groups
4. Social media (Facebook and Twitter accounts) and our group website - https://www.thehannagroup.org/
5. Charities such as Oesophageal Patients Association (OPA) and Oxfordshire oesophageal and stomach Organisation (OOSO).