Tick box questionnaire could significantly improve esophageal cancer survival rates

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A simple health questionnaire could be a highly effective tool to pre-screen people for early signs of oesophageal cancer, enabling much earlier diagnosis and treatment, finds a UCL-led study.

The research, published in *Lancet Digital Health*, used artificial intelligence to analyse a large oesophageal cancer dataset, known as BEST2 (1,299 patients), to establish which health factors were common in those individuals who had Barrett's oesophagus.

Barrett's oesophagus is a condition where the cells of the oesophagus (gullet) grow abnormally and is usually caused by acid reflux. Barrett's oesophagus is not a cancer, but is the only known pre-cursor for oesophageal cancer, increasing the risk of cancer by 30 to 60 fold.

Significantly, AI found eight factors: age; gender; smoking; waist circumference; frequency of stomach pain; duration of heartburn; acid taste; and taking of acid suppression medicines, which were markers in those individuals who either had Barrett's oesophagus or went on to develop it.

As a control, the risk factors identified by AI in BEST2, were then tested on a different oesophageal cancer dataset, known as BOOST (398 patients), and the conclusions were the same.

Lead author, Professor Laurence Lovat (UCL Surgery & Interventional Science and UCLH) said: "Our evidence highlights a set of risk factors,

which could act as an early warning sign for the likelihood of developing Barrett's oesophagus, and potentially oesophageal cancer.

"We propose developing a simple tick box questionnaire, identifying risks such as a large waist circumference, severe stomach pain and duration of heartburn, which could be filled out by a GP or by a patient using a mobile phone app.

"The results would identify a high risk group of people at an early stage, who could then go on to have clinical screening to diagnose and treat oesophageal cancer at a much earlier stage and significantly improve survival rates."

Each year, around 9,100 people in the UK are diagnosed with oesophageal cancer and the long term survival rate for patients is only 12%, but 59% of cases are preventable.

However there is currently no national screening programme, unlike breast, bowel and cervical cancer, and potential screening methods including endoscopy and cytosponge (sponge on a string) are deemed too invasive or not adequately proven for a national screening programme.

"Early diagnosis is crucial to change disease outcome but symptoms in early oesophageal cancer are often either absent or indistinguishable from uncomplicated gastroesophageal reflux," added Professor Lovat.

"Barrett's oesophagus is the only known precursor and a pre-screening questionnaire could help GPs identify those people, who should have an endoscopy or cytosponge. This approach could also save many people from having invasive tests which eventually turn out to be normal."

There are limitations to this study. Significantly, as both datasets were collected from at-risk individuals, the dataset was enriched for the

patients with Barrett's oesophagus. A dataset more representative of the general population, with fewer disease instances, could potentially yield different results. This research, known as MARK-BE study, was funded by the Charles Wolfson Charitable Trust and Guts UK and supported by the NIHR UCLH Biomedical Research Centre.

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