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Investigating the use of a new fluorescent compound to identify pre cancerous and cancerous lesions in the bowel

Submission date
29/07/2016

Recruitment status
No longer recruiting

Registration date
07/04/2017

Overall study status
Completed

Last Edited
16/01/2018

Condition category
Cancer

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims

In the UK, over 40,000 patients are diagnosed with colorectal cancer each year1. Colonoscopy is an important diagnostic and therapeutic procedure in the management of colorectal cancer. The gold standard has been white-light endoscopy for screening the general population and for surveillance of patients at high risk of developing cancer. Early detection of colorectal lesions in screening has been shown to reduce colorectal cancer mortality. However, the detection of flat and depressed neoplasms presents a particular challenge. Recent developments to aid the detection and characterisation of dysplastic lesions include chromoendoscopy, narrow band imaging (NBI), auto-fluorescence (AFI) and confocal endomicroscopy. The development of an adjunct tool to specifically identify premalignant colorectal dysplasia and cancer, and to help distinguish between polyps. A key issue during transanal endoscopic microsurgery (TEMS) and endoscopic mucosal resection (EMR) is to determine where the resection margin should be. Based on conventional white light visualisation, it is often difficult to discern where that margin should be, particularly for flat or carpet-like lesions. A fluorescent tool that can highlight dysplastic tissue would therefore allow complete resection of abnormal tissue. Recent developments in molecular imaging include the generation of fluorescent probes. Lectins are specific carbohydrate recognition proteins and have previously been used to identify malignant tissue through changes in glycosylation observed in carcinogenesis. A detailed understanding of the changes in glycoprotein expression and glycosylation patterns that occur during carcinogenesis may help to identify potentially useful markers of dysplasia. Fluorescently labelled lectins therefore have the potential to distinguish dysplasia and cancer from normal mucosa, based on their differential binding. We have identified and used a fluorescently labelled lectin, Wisteria floribunda (WFA) as an adjunct endoscopic tool, which binds to normal mucosa, but not to high grade dysplasia or cancer. This lectin can also distinguish benign hyperplastic polyps (HPs) from pathologically significant polyps, including sessile serrated polyps (SSPs), traditional serrated adenomas (TSAs) and mucinous cancers. Our lectin can also identify areas of dysplasia in freshly resected ulcerative colitis and TEMS specimens. The lectin can be visualised using fluorescence-enabled endoscopes, e.g. ETMI (endoscopic Trimodal Imaging) colonoscopies.

Who can participate?
Adults aged 18 and older who are undergoing endoscopy procedures.

What does the study involve?
Participants who are undergoing endoscopy have their colonoscopy with white light as per standard practice. The fluorescent lectin is applied to any lesions identified with white light and an assessments are made on the fluorescence level. Where no lesions have been identified with white light, the fluorescent lectin is applied to a segment of colon to assess whether the lectin identifies any additional abnormalities. Following this their procedure is completed as per standard practice and the participant returns to recovery. Routine observations will be taken by the nursing staff and any side effects will be reported. Participants undergoing surgery are anaesthetised and positioned as per standard care. The lectin is applied to the lesion prior to excision and an assessment be made on its fluorescence. After excision, images aretaken of the resection margin. The procedure is completed. Following the procedure the surgeon is asked whether they would change the resection margin based on the appearance of the lectin, and this is compared to the histolopathologists reports of the margin. The participant returns to recovery and receive their routine care. All patients have their clinical notes reviewed 30 days post-procedure for any complications.

What are the possible benefits and risks of participating?
The potential benefits of this procedure would be the earlier and clearer identification of tumours and cancers, and to help guide resection margins during polypectomy and surgery. The potential risks would be the possible side effects of application of lectins topically to patient's colon and rectum, which may include diarrhoea and nausea, and a lengthier examination as a result of using this new technology. The patient population would be patients undergoing endoscopic procedures, including colonoscopy and flexible sigmoidoscopy. We will also include patients undergoing transanal endoscopic microsurgery (TEMS), including robotic assisted procedures. The results of this study will inform future research and practice.

Where is the study run from?
Oxford University Hospital (UK)

When is the study starting and how long is it expected to run for?
July 2016 to January 2019

Who is funding the study?
Medical Research Council (UK)

Who is the main contact?
Mr Thomas Barnes (Public)

Contact information

Type(s)
Public

Contact name
Mr Thomas Barnes

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Additional identifiers

Protocol serial number
LECTIN Trial

Study information

Scientific Title
Investigating the use of a fluorescent lectin to identify dysplasia and cancer during endoscopy and surgery

Acronym
LECTIN Trial

Study objectives
Fluorescein conjugated wisteria floribunda identifies dysplasia and cancer during colonoscopy and transanal endoscopic microsurgery (TEMS).

Ethics approval required
Old ethics approval format

Ethics approval(s)
Board NRES Committee South Central - Oxford B, 01/07/2016, ref: 14/SC/1250

Study design
Non-randomised single-arm feasibility study

Primary study design
Observational

Study type(s)
Diagnostic

Health condition(s) or problem(s) studied
Colorectal cancer

Interventions
For patients having endoscopy, they will initially have their colonoscopy with white light as is standard practice. The fluorescent lectin is applied to any lesions identified with white light and an assessments are made on the fluorescence level. Where no lesions have been identified with white light, the fluorescent lectin is applied to a segment of colon to assess whether the lectin

identifies any additional abnormalities. Following this their procedure is completed as per standard practice and the patient returns to recovery. Routine observations will be taken by the nursing staff and any side effects will be reported. Patients are discharged as per instructed by their clinician.

For patients undergoing surgery they are anaesthetised and positioned as per standard care. The lectin is applied to the lesion prior to excision and an assessment be made on its fluorescence. After excision, images are taken of the resection margin. The procedure is completed. Following the procedure the surgeon are asked whether they would change the resection margin based on the appearance of the lectin, this is compared to the histolopathologists reports of the margin. The patient returns to recovery and receive their routine care.

All patients have their clinical notes reviewed 30 days post-procedure for any complications.

Intervention Type
Procedure/Surgery

Primary outcome(s)
1. Signal to background ratio after application of lectin is measured using the fluorescence ratio of WFA binding to normal versus dysplastic/early cancer tissue during endoscopic or surgical procedure
2. Detection rate of dysplastic and cancerous lesions compared to white light alone is measured as the number of lesions identified during endoscopic or surgical procedure and calculating the sensitivity and specificity

Key secondary outcome(s))
No secondary outcome measures

Completion date
01/01/2019

Eligibility

Key inclusion criteria
1. Participant is willing and able to give informed consent for participation in the study
2. Male or female, aged 18 years or over
3. Patients undergoing endoscopic procedures including colonoscopy and flexible sigmoidoscopy as well as transanal endoscopic microsurgery (TEMS), including robotic assisted TEMS
4. In the investigator’s opinion, is able and willing to comply with all study requirements

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Key exclusion criteria
1. Patient who is unable or unwilling to give informed consent
2. Female participant who is pregnant, lactating or planning pregnancy during the course of the trial. If there is an uncertainly regarding whether a woman could be pregnant, then they will be excluded from the study.
3. Patients with known egg allergies, ovalbumin allergy and soya allergies

Date of first enrolment
01/07/2016

Date of final enrolment
01/01/2019

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Oxford University Hospital
Headley Way
Headington
Oxford
United Kingdom
OX3 9DU

Sponsor information

Organisation
University of Oxford

ROR
https://ror.org/052gg0110

Funder(s)

Funder type
Research council

Funder Name
Medical Research Council

Alternative Name(s)
Medical Research Council (United Kingdom), UK Medical Research Council, Medical Research Committee and Advisory Council, MRC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
HRA research summary			28/06/2023	No	No