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Can we analyse stool content to improve the prediction of the risk of developing bowel cancer?

Submission date
19/05/2022

Recruitment status
No longer recruiting

Registration date
23/09/2022

Overall study status
Completed

Last Edited
23/09/2022

Condition category
Cancer

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

Plain English summary of protocol

Background and study aims
Colorectal cancer (CRC) is the third most common cancer in men and the second in women. However, CRC is a highly preventable disease and effective screening methods are available. To date, scientific research is studying new methods to use information relating to the amount of faecal haemoglobin (f-Hb) in stool tests (Faecal Immunochemical Test [FIT]).
The capacity of these tests to identify polyps or tumours is low on a single round of screening, but it increases over repeated rounds. Available evidence suggests that the sum of the f-Hb in the last two screening rounds could better identify the lesions.
This study has two aims: the first one is to compare the effectiveness of risk-tailored screening protocols based on the individual risk, assessed through the cumulative f-HB level of the last two screening rounds, with standard screening strategies.
The second aim is to determine the contribution of other potential biomarkers (such as microbiome profiles and miRNA signatures), to identify the presence of polyps or tumours, alone or in combination with the f-HB level accounting for the exposure to modifiable lifestyle risk factors.

Who can participate?
All people from 59 to 69 years of age invited to the FIT-based screening program in Turin and Biella will be included in the study unless they expressly deny consent. The subjects who report a recent colonoscopy or a positive FIT test result are not eligible for the study.

What does the study involve?
The group of subjects with cumulative f-Hb level in the last two tests above the positive threshold will be considered as a high-risk group and will undergo to a personalized screening protocol. The low-risk group of subjects with undetectable f-Hb level in the last two tests will undergo a less intensive screening protocol.
Moreover, a small group of participants will provide one blood sample and one additional stool sample in order to identify novel CRC biomarkers. The same people will answer a questionnaire

about health conditions and lifestyles, such as nutrition, physical activity, and smoking. The relationship between lifestyle information and CRC biomarkers could allow a future more accurate stratification of the risk groups.

What are the possible benefits and risks of participating?
A personalized screening protocol will allow high-risk groups to prevent or detect the disease early if present. The low-risk group will have a lower chance of suffering the negative effects of screening, such as false-positive results and useless colonoscopies, which may cause discomfort and potential risks. The screening would mainly be directed to those people who get the highest potential benefit while screening intensity and thus potential harms would be reduced in individuals who benefit less.

Where is the study run from?
The study is being run by the Hospital Città della Salute e della Scienza of Turin, in collaboration with the Italian Institute for Genomic Medicine-IIGM and the Edo and Elvo Tempia Foundation (Italy)

When is the study starting and how long is it expected to run for?
October 2020 to June 2026

Who is funding the study?
This study is funded by the AIRC Foundation (Italy)

Who is the main contact?
Dr Carlo Senore
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Contact information

Type(s)
Principal investigator

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Study information

Scientific Title
Combining faecal biomarkers to improve prediction of individual risk of pre-invasive and invasive colorectal lesions

Acronym
BioSCoPe

Study objectives
In the colorectal cancer (CRC) screening program, a tailored approach could allow to focus on those most likely to benefit. Using the faecal-haemoglobin (f-Hb) level at each faecal immunochemical test (FIT) could categorize the risk groups to undergo different screening protocols. Moreover the stratification of subjects in the different risk groups could be sharped combining of f-Hb level with the information about diet and lifestyle and/or with novel CRC biomarkers.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 01/10/2020, Inter-company ethics committee A.O.U. Città della Salute e della Scienza di Torino – A.O. Ordine Mauriziano di Torino – A.S.L. Città di Torino (Corso Bramante, 88/90 - 10126 Turin, Italy; +39 (0)11 6331633; comitatoetico@cittadellasalute.to.it), ref. n° 0091912 (A/2. 4.8-N. 00391/2020)

Primary study design
Observational

Study design
Multi-centre observational randomized controlled trial of tailored screening

Study type(s)
Screening

Health condition(s) or problem(s) studied
Colorectal advanced neoplasia, advanced adenoma and colorectal cancer

Interventions
The randomization will be performed within the IT system governing the screening program. Subjects eligible for inclusion in the study will be randomized at the time of sending the FIT result to the study arms using a randomization algorithm embedded in the screening program software.

Based on the level of risk determined with the cumulative f-Hb measurement in the last two FIT, subjects will be assigned different screening intervals:

Group a) subjects with cumulative f-Hb concentration ≥ 20 µg/gr faeces are randomized to (ratio 1:1:1):
1) immediate total colonoscopy (TC) referral
2) 1-year FIT
3) 2-year FIT
Group b) subjects with undetectable f-Hb are randomized to (ratio 2:1):

1) 3-year FIT
2) 2-year FIT

Subjects with cumulative f-Hb level in the last two FIT between 4-19.9 µg Hb/g faeces will not be targeted for the trial and they will be managed according to the standard screening protocol (2 years).
A subgroup of subjects with undetectable f-Hb by the FIT will be asked to undergo a colonoscopy to exclude the presence of neoplastic lesions of the colon.

All screenees with a positive FIT result and those referred for immediate TC in group a), will be administered a lifestyle questionnaire (LSQ) and they will also be asked to provide a blood sample and a second faecal sample which will be stored, together with the aliquots of the left-over from their FIT sample. A matched (by gender and age) sample of subjects enrolled in group b) will be asked to answer the LSQ and to provide the same biological samples as subjects in group a).

An external control group will also be sampled among subjects eligible for regular 2-year interval screening.

Intervention Type
Other

Primary outcome(s)
Measured using patient records:
Group a)
Advanced neoplasia (AN) detection rate and CRC distribution by colonic site and stage at diagnosis of screen-detected CRCs, measured at the index TC in group 1; cumulative AN yield over two FIT examinations performed at 1-year interval in group 2 and at the second round in group 3.
Group b)
Positivity rate (PR), positive predictive value (PPV) and AN detection rate, measured at the subsequent screening round in each arm, and CRC distribution by colonic site and stage at diagnosis of screen-detected CRC.

Key secondary outcome(s)
Measured using patient records:
1. Interval cancer (IC) rate. Interval cancers are identified through analysis of hospital discharge records and population cancer registry data. The rate will be estimated over a 2-year period following a negative FIT. The researchers will use the proportional incidence method to compare the observed to the expected (in the absence of screening) rate.
2. PPV for advanced adenoma (AA) and for CRC of immediate colonoscopy referral and of the positive FIT results, measured as the proportion of subjects detected with the lesion of interest over the total number of subjects undergoing TC.

Completion date
30/06/2026

Eligibility

Key inclusion criteria

Subjects at intermediate risk for CRC eligible for invitation to the regional screening program: all residents, aged 59 to 69 years, attending the screening invitation in the Turin and Biella screening programs.

Participant type(s)
All

Healthy volunteers allowed
No

Age group
Senior

Lower age limit
59 Years

Upper age limit
69 Years

Sex
All

Key exclusion criteria
1. Recent examination (colonoscopy or FIT)
2. Personal or family history of CRC
3. Disabling or terminal illness
4. Unable to provide informed consent
5. Over the age of 64 years at the time of recruitment, who would no longer be eligible for subsequent invitations to screening, which is discontinued for subjects over 69 years of age

Date of first enrolment
01/06/2022

Date of final enrolment
30/06/2026

Locations

Countries of recruitment
Italy

Study participating centre
Epidemiology and screening Unit CPO - University Hospital Città della Salute e della Scienza of Turin
Via Cavour, 31
Torino
Italy
10123

Study participating centre
Fondazione Edo ed Elvo Tempia
Via Malta, 3
Biella
Italy
13900

Study participating centre
Italian Institute for Genomic Medicine - IIGM
SP142 km 3,95 Candiolo
Turin
Italy
10138

Sponsor information

Organisation
Azienda Ospedaliera Citta' della Salute e della Scienza di Torino

ROR
https://ror.org/001f7a930

Funder(s)

Funder type
Charity

Funder Name
Associazione Italiana per la Ricerca sul Cancro

Alternative Name(s)
Italian Association for Cancer Research, The Italian Association for Cancer Research, AIRC

Funding Body Type
Private sector organisation

Funding Body Subtype
Associations and societies (private and public)

Location
Italy

Results and Publications

Individual participant data (IPD) sharing plan
The data-sharing plans for the current study are unknown and will be made available at a later date

IPD sharing plan summary
Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol file	version 2.0	10/07/2020	30/05/2022	No	No