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Breast cancer in Ethiopia

Submission date 22/06/2023	**Recruitment status** No longer recruiting	[ ] Prospectively registered [ ] Protocol
Registration date 31/08/2023	**Overall study status** Completed	[ ] Statistical analysis plan [ ] Results
Last Edited 22/01/2024	**Condition category** Cancer	[ ] Individual participant data [ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Breast cancer is a threat to human life in all parts of the world. It is the most common form of cancer in women globally. The incidence of breast cancer is rapidly increasting in low- and middle income countries where patients are young at diagnosis. A surprisingly large proportion of the patients are men. The knowledge of pathogenic variants predisposing of breast cancer is inadequately investigated. Adherence to recommended treatment and therapies is probably limited due to many reasons. In this project, several issues relating to early onset breast cancer in Ethiopia as well as the possibility of using artificial intelligence as an aid in breast cancer diagnostics will be investigated. A Swedish group of patients are used for comparison regarding the part of the project focusing on tumour biology and occurrence of pathogenic variants. The project is divided into five substudies outlined below.

Who can participate?
Women aged 18 - 39 years and men 18 year and older with breast cancer and their first-degree relatives, as well as healthcare workers.

What does the study involve?
Study 1. 100 patients with breast cancer in Ethiopia will be included in the study. These are women 18-39 years and men 18 years and above. The occurrence of pathogenic variants associated with an increased risk of the development of breast cancer will be investigated. Tumour biology with immunohistochemistry will be carried out and for about 50 of the patients, molecular subtyping will also be carried out. For the investigations, blood will be drawn and core needle biopsy of the tumour will be done. A comparison group of 100 Swedish patients with the same inclusion criteria will also be included and the corresponding information about these patients will be extracted from electronic patient files.

What are the possible benefits and risks of participating?
The benefits of the study participants in Ethiopia include more advanced diagnostic investigations than usual. This has potential to lead to subsequent treatment (surgery, chemotherapy, hormonal therapy and radiation) better adapted to the individual circumstances (tumour biology) of each patient. The genetic screening will not directly benefit the patients but has potential to benefit their first degree relatives at risk of development of breast cancer. In these study participants, early diagnosis or prophylactic intervention has potential to lead to better outcomes in the long term.

The risks are associated with potential stigma relating to breast cancer and of carrying genetic variants predisposing to breast cancer. The interventions (blood sampling and core needle biopsy of the tumours) carry minimal risk of adverse events.
There are no specific benefits for the Swedish study participants. There are also no specific physical or psychological risks for the Swedish study participants as the study only includes information from patient files. The investigations for these patients have previously been carried out as routine care.

Where is the study run from?
Study participants will be enrolled at the Tikur Anbessa University Hospital in Addis Ababa, Ethiopia and at SÖS general Hospital in Stockholm, Sweden.

When is the study starting and how long is it expected to run for?
June 2020 to December 2025

Who is funding the study?
The Swedish Research Council

Who is the main contact?
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Contact information

Type(s)
Principal investigator

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Study information

Scientific Title
Breast Cancer in Ethiopia - Biology, Genetics and Innovation

Study objectives

1. What is the knowledge, perceptions and attitudes to genetic screening for pathogenic variants in breast cancer among patients, first degree relatives and health care workers in Ethiopia?
2. What is the prevalence of pathogenic variants associated with increased risk for the development of breast cancer among women 18-39 years old and men 18 years and above, with breast cancer, at the Tikur Anbessa University Hospital in Ethiopia? What are the differences and similarities compared to patients at SÖS general Hospital in Sweden?
3. What is the distribution of tumour biology and molecular sybtypes of breast cancer among women 18-39 years old and men 18 years and above, with breast cancer, at the Tikur Anbessa University Hospital in Ethiopia?
4. What is the adherence to recommended treatment and therapies for breast cancer in women 18-39 years old and men 18 years and above, at the Tikur Anbessa University Hospital in Ethiopia?
5. What are the outcomes of breast cancer among women 18-39 years old and men 18 years and above, with breast cancer, at the Tikur Anbessa University Hospital in Ethiopia?
6. Can artificial intelligence be used for breast cancer diagnostics for patients with breast cancer at the Tikur Anbessa University Hospital in Ethiopia?

Ethics approval required
Ethics approval required

Ethics approval(s)
1. Approved 24/06/2020, Addis Ababa University, College of Health Sciences Institutional Review Board (College of Health Sciences, Addis Ababa University, Zambia Street, Addis Ababa, CHS building #710, Ethiopia; +251 11896 1396; chs.irb@aau.edu.et), ref: 047/20/Patho

2. Approved 03/06/2020, Swedish Ethical Review Authority (Etikprövningsmyndigheten, Box 2110, Uppsala, 750 02, Sweden; +46 10-475 08 00; registrator@etikprovning.se), ref: 2019-06228

Primary study design
Observational

Study design
Observational prospective cohort study

Study type(s)
Diagnostic, Quality of life, Screening, Treatment

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

Interventions
Study 1. 200 patients with breast cancer will be included in the study – 100 in Ethiopia (from Tikur Anbessa University Hospital) and 100 in Sweden (from SÖS general hospital). The patients are women 18-39 years and men 18 years and above. The occurrence of pathogenic variants associated with an increased risk of the development of breast cancer will be investigated in the Ethiopian cohort and compared to the Swedish cohort where these investigations have already been done as part of routine care. For the Ethiopian patients, tumour biology with immunohistochemistry will be carried out and for about 50 of the patients, molecular subtyping will also be carried out. The corresponding information about the Swedish patients will be retrieved through review of electronic patient files. For the investigations, blood will be drawn and core needle biopsy of the tumour will be done.

Study 2. Outcomes of breast cancer and adherence to recommended treatment and therapies among study participants in study 1. Patients will be interviewed at enrollment in the study and after one year. Information will include the medical history of the study participants and information regarding breast cancer among first degree relatives. Information about the recommended treatment and therapies for the study participants as well as information about disease progression will be achieved through patient interviews, medical files and the medical professionals involved in the management of the patient. Treatment recommended will be compared to treatment received and the reasons for non-adherence, if applicable, will be explored. In case of the death of a study participant, a next of kin will be interviewed. Quality of life will also be investigated at inclusion in the study and after one year.

Study 3. In this study, the first degree relatives of the study participants in study 1 and who have confirmed pathogenic variants associated with the development of breast cancer will be offered genetic guidance and investigation. The occurrence of the identified pathogenic variants will be investigated. Positive cases will be enrolled in a follow up program that is being under development as part of the study. For this study, blood will be drawn for extraction of DNA to be used for genetic screening.

Study 4. In this qualitative study, the knowledge, attitudes and interest for genetic screening in breast cancer among patients with breast cancer (study participants in study 1), first degree relatives of study participants in study 1 and health care workers. Around 15 in each group will be included but the final sample size will be determined based on information power. For this study, the participants will be interviewed. Each interview will last around one hour and it will be recorded for transcription.

Study 5. In this study the accuracy and usefulness of artificial intelligence as a support tool for histopathological diagnosis of breast cancer will be assessed. The tumour material will consist of retrospectively collected tumour blocks, tumour material from the study participants in study 1 as well as a general population of breast cancer patients. In total, it is estimated that 500 tumour blocks will be investigated for this study.

Intervention Type
Genetic

Primary outcome(s)
Occurrence of pathogenic variants predisposing for breast cancer in patients with breast cancer (women 18 - 39 years and men above 18 years) measured using DNA extracted from blood at inclusion or earliest convenient time point (early in study).

Key secondary outcome(s)
1. Occurrence of pathogenic variants predisposing for breast cancer in first degree relatives of patients with breast cancer and who are confirmed carriers of such pathogenic variants (ie positive cases for the primary outcome measure) measured using DNA extracted from blood at inclusion or earliest convenient time point (early in study). It's difficult to say exactly when it will be done. First the 100 index patients need to be included in the study and their analyses done. We expect to have these results in late 2023.
2. Knowledge, attitudes and perceptions of genetic testing for pathogenic variants predisposing for breast cancer in patients with breast cancer, their first degree relatives and health care workers measured using qualitative interview at inclusion in the study and no further data collection after that is planned.
3. Tumour biology and molecular subtype of breast cancer in women 18 - 39 years and men 18

years and above measured by analysis on breast cancer tissue at inclusion or earliest convenient time point (early in study). It's difficult to say exactly when it is done as it includes a combination of core needle biopsy done early on and resected tumour during surgery. Timing of surgery is hard to predict. We expect to have collected all tissues by 2023.
4. Outcomes of breast cancer in women 18 - 39 years and men 18 years and above measured by questionnaire based interviews with patients, contact over phone potentially with next of kin for patients who have died, patient files at the hospital at one year after inclusion in the study.
5. Adherence to recommended treatment and therapies among women 18 - 39 years and men 18 years and above with breast cancer measured using questionnaire based interviews with patients, contact over phone potentially with next of kin for patients who have died, patient files at the hospital at one year after inclusion in the study.

Completion date
31/12/2025

Eligibility

Key inclusion criteria
1. Patients with breast cancer, women 18-39 years and men 18 years and above.
2. First degree relatives (female) of the above patients.
3. Health care workers.

Participant type(s)
Patient, Health professional, Other

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
All

Key exclusion criteria
1. Women 40 years and above
2. Non-malignant breast tumour
3. Inability or unwillingness to give informed consent

Date of first enrolment
01/03/2022

Date of final enrolment
31/12/2025

Locations

Countries of recruitment
Ethiopia

Sweden

Study participating centre
Tikur Anbessa University Hospital
Addis Ababa
Ethiopia
-

Study participating centre
SÖS General Hospital
Stockholm
Sweden
-

Sponsor information

Organisation
Karolinska Institutet

ROR
https://ror.org/056d84691

Funder(s)

Funder type
Government

Funder Name
Vetenskapsrådet

Alternative Name(s)
Swedish Research Council, VR

Funding Body Type
Government organisation

Funding Body Subtype

National government

Location
Sweden

Results and Publications

Individual participant data (IPD) sharing plan
The datasets will be stored in an online repository at Karolinska Institutet. Datasets may be made accessible to researchers pending ethical approvals. The exact details of the data sharing plan will be made available at a later date. Metadata will be stored in a publicly available repository.

IPD sharing plan summary
Stored in non-publicly available repository, Data sharing statement to be made available at a later date