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Correlation analysis of HIF-1α and CA15-3 in response to neoadjuvant chemotherapy in locally advanced breast cancer

Submission date
27/07/2021

Recruitment status
No longer recruiting

Registration date
07/09/2021

Overall study status
Completed

Last Edited
07/09/2021

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
Breast cancer is the most common cancer among Indonesian women. Locally advanced breast cancer (LABC) means that the cancer has spread into nearby tissue and lymph nodes around the breast. The main treatment choice of LABC is neoadjuvant chemotherapy. Neoadjuvant chemotherapy is chemotherapy that a person with cancer receives before their main course of treatment. The aims of this study are to prove the correlation between the marker protein HIF-1α and the Response Evaluation Criteria in Solid Tumors (RECIST), to compare the relationship between the marker protein Ca15-3 and RECIST, and to assess the relationship among all of them in patients with LABC.

Who can participate?
Women with LABC treated with two cycles of neoadjuvant chemotherapy regimen (cisplatin and gemcitabine)

What does the study involve?
Before and after undergoing two cycles of neoadjuvant chemotherapy participants have their levels of HIF-1α and CA15-3 measured and their tumor lesions are measured using RECIST.

What are the possible benefits and risks of participating?
The advantages of participating in the study include knowing whether the chemotherapy worked or not. Although the possible risks of participating are low, some patients may experience side effects such as dizziness, palpitations and pain on the punctured area from blood being drawn.

Where is the study run from?
RSUP Prof. dr. R. D. Kandou Manado (Indonesia)

When is the study starting and how long is it expected to run for?
July 2020 to November 2021

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Mendy Hatibie
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Contact information

Type(s)
Scientific

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Additional identifiers

Study information

Scientific Title
Correlation analysis of HIF-1α and CA15-3 in response to neoadjuvant chemotherapy in locally advanced breast cancer: a cohort study in Indonesia

Study objectives
Expression of the HIF-1α protein is an important predictive biomarker for pathological complete response (pCR) in locally advanced breast cancer (LABC) initially treated with neoadjuvant chemotherapy (NAC). Loss of the HIF-1α protein may indicate a favorable response to NAC and provides a good prognosis for patients with breast cancer (BC). Currently, Ca15-3, the protein product of the MUC1 gene, is the most widely used serum marker in BC often used to assess therapeutic response and prognosis. Determination of Ca15-3 levels in postoperative patients with BC is useful for the early detection of recurrence or metastasis. Furthermore, the response evaluation criteria in solid tumors (RECIST) is an objective response parameter that can demonstrate the efficacy of NAC. This study aimed to establish the relationship between HIF-1α and RECIST, compare Ca15-3 levels to RECIST values, as well as assess the relationship among these three variable factors in LABC.

Ethics approval required

Old ethics approval format

Ethics approval(s)
Approved 17/07/2020, Dr. R.D. Kandou Hospital Manado (Jalan Raya Tanawangko No.56, Manado, Sulawesi Utara, 95163, Indonesia; +62 (0)431 8383058; ekoprasetyo@unsrat.ac.id), ref: 048/EC/KEPK KANDOU/VI/2020

Primary study design
Observational

Study design
Observational prospective cohort study

Study type(s)
Screening

Health condition(s) or problem(s) studied
Locally advanced breast cancer

Interventions
Lesion measurement
All measurements are recorded in matrix notation using a clinical caliper. All baseline measurements were taken at the start of therapy or within 4 weeks of treatment. Target lesions were evaluated according to the RECIST criteria: Complete Response (CR): Disappearance of all target lesions; Partial Response (PR): At least a 30% decrease in the sum of the longest diameter (LD) of the target lesion, with the baseline sum LD as the reference; Progressive Disease (PD): At least a 20% increase in the sum of the LD of the target lesion, with the smallest sum LD recorded since the treatment started or the appearance of one or more new lesions as the reference; Stable Disease (SD): Neither sufficient shrinkage to qualify for PR nor sufficient increase to qualify for PD, taking as a reference the smallest sum LD since the treatment started.

HIF-1α and Ca15-3 quantification
Blood samples (4-5 ml) were collected from a peripheral vein. The blood serum was separated in a plain vacuum tube, aliquoted, and stored at -20°C until used in subsequent assays for HIF-1α and Ca15-3 in the Biomolecular and Immunology Laboratory of the Faculty of Medicine at Sam Ratulangi University in Manado, Indonesia. Ca15-3 levels were determined using an ELISA Kit Elecsys CA 15-3 II (Roche Diagnostics, cat. no. 07027001190, Indianapolis, USA) and HIF-1α activity was measured spectrophotometrically using the Human HIF-1α ELISA Kit (Merck Millipore, cat. no. RAB1057, Burlington, MA, USA). HIF-1α and Ca15-3 levels were measured before NAC and after receiving NAC according to the manufacturer’s instructions.

Intervention Type
Drug

Phase
Not Applicable

Drug/device/biological/vaccine name(s)
Cisplatin, gemcitabine

Primary outcome(s)

HIF-1α and CA15-3 serum levels measured using ELISA at baseline and after receiving two cycles of NAC (Neoadjuvant chemotherapy) in a period of 5 weeks

Key secondary outcome(s)
Lesion measurement recorded in matrix notation using a clinical caliper and evaluated according to the Response Evaluation Criteria in Solid Tumors (RECIST) criteria at baseline and after receiving two cycles of NAC (Neoadjuvant chemotherapy) in a period of 5 weeks

Completion date
05/11/2021

Eligibility

Key inclusion criteria
1. LABC with a histopathologically confirmed diagnosis of invasive ductal carcinoma
2. NAC regimen of cisplatin (80 mg/BSA) and gemcitabine (1,000 mg/BSA) in two cycles
3. Karnofsky Performance Status Scale >70%

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Sex
Female

Key exclusion criteria
1. Receiving chemotherapy with radiotherapy
2. Bilateral BC
3. Abnormal hematological parameters
4. Changes in chemotherapy regimen
5. Patients with an inherited metabolic disorder or comorbidities resulting in delayed chemotherapy
6. Acute or chronic obstructive pulmonary disease with SpO_2 under 96%

Date of first enrolment
01/07/2021

Date of final enrolment
08/10/2021

Locations

Countries of recruitment
Indonesia

Study participating centre
R.D. Kandou Hospital
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Sponsor information

Organisation
RSUP Prof. dr. R. D. Kandou Manado

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request from Mendy Hatibie (mendy.hatibie@unsrat.ac.id).

IPD sharing plan summary
Available on request