252 (PB-068) Poster

Breast cancer patients' communication needs and wishes for an explainable Artificial Intelligence prediction model for lymphedema

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Background: Lymphedema can be a side effect of surgery and loco-regional radiotherapy (RT) in breast cancer (BCa) patients, and has the potential to have a major impact on the quality of life. Predicting the personalized risk of lymphedema can guide a more tailored treatment and provide (lifestyle) advice (in case of high risk) to reduce the risk and severity of lymphedema. In the ongoing multi-centre Horizon Europe collaborative study, PRE-ACT (Prediction of Radiotherapy side Effects using explainable AI for patient Communication and Treatment modification), explainable Artificial Intelligence (AI) is used to predict lymphedema and other side effects (toxicity) from RT in BCa patients. For the development of a clinical trial using the AI prediction model, it is imperative that it fits the needs of BCa patients.

Material and Methods: Onsite and online focus groups were held in the Netherlands (n = 6) and in the United Kingdom (n = 4). Former BCa patients were recruited via the radiation oncology clinic Maastro and the Breast Cancer Foundation in the Netherlands, and in the United Kingdom via advertisements on social media and the Breast Cancer Now Voices group. Questions regarding the *kind of information* patients need about their personalized risk of developing lymphedema, *how* the information should be given to them and *when* the information is needed, were asked. The focus groups were recorded (with audio and transcription) and coded memos were used. Qualitative data were transcribed verbatim and analysed following a conventional content analysis.

Results: BCa patients wanted to be knowledgeable on the representativeness of the AI model for their personal situation and the possible side effects and impact of lymphedema. Support was warranted, not only from physicians, but also from high quality information, differentiated to what a BCa patient needs and is able to handle. Although BCa patients preferred digital and visual information on the risk of obtaining lymphedema, they preferred a physical consultation to discuss treatment options and supportive measures. Specifically in the Netherlands, BCa patients preferred two consultation moments in order to process information and make an informed decision. The order was not specifically stated, e.g. (1) first consult, then read/discuss at home and then decision consult or (2) first information with instruction, then read/discuss at home and then decision consult.

Conclusions: BCa patients have a clear view on what, when and how they would like to receive information of an explainable AI prediction model, highlighting representativeness and impact on their personal situation and processing of high quality information. These needs are incorporated into a digital communication package, which is tested in a clinical trial, to facilitate risk communication and value elicitation during shared decision-making.

No conflict of interest.

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253 (PB-069) Poster

High fiber diet to counteract early signs of heart damages: an ultrastructural morphological study to pioneer new strategies for management of cardiotoxicity in breast cancer

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Background: Among comorbidities that can affect care and clinical outcomes of breast cancer (BC) patients, cardiovascular diseases (CVDs) are the most frequent and relevant. BC and CVDs are multifactorial, with highly overlapping risk factors and a direct mutual effect. Of note, in patients with early-stage BC, most of post-treatment recurrence and cancer-specific deaths are related to CV events. Recent clinical and experimental evidence in human microbiota studies shed light on the contribution of gut microbiota alteration to the development and progression of CVDs, but also suggests diet intervention as a potential strategy to mitigate anti-cancer therapy side effects.

In this context, we recently investigated in an *in vivo* experimental model of HER2-positive BC the effects of gut microbiota homeostasis alteration, induced by antibiotic dissolved in drinking water, on the cardiac muscle tissue, and the eventual protection of high-fiber diet toward heart damage.

Material and Methods: Groups: untreated (CT), treated with vancomycin followed after by administration of normal (VAN) or high fiber diet (HFiber) Friend leukemia virus B (FVB) mice, subcutaneously injected with HER2+ BC cells. Heart tissue structure and ultrastructure have been analyzed by light and transmission-electron microscopy (TEM), respectively; mitochondria dynamics have been assessed by Real-time PCR and proteomic approaches (FT-Orbitrap).

Results: Light microscopy analysis did not reveal any morphological alteration induced by VAN. Image analysis of digitalized TEM images of cardiomyocytes showed that the regular arrangement of myofibrils was preserved, but mitochondria in the VAN group were significantly larger and more elongated compared to CT. The number of preserved mitochondria was lower, whereas the number of partially and totally damaged mitochondria was higher, in the VAN group compared with the CT. No significant alteration has been detected in the HFiber group. Molecular characterization of mitochondria dynamics indicated that oral antibiotics administration induced upregulation of expression of genes driving mitochondria fusion, such as OPA1, DNM1, MFS1, and a trend of reduction of biogenesis related-genes such as NRF1 and PPRargc1, is consistent with the observed size increase in the group of dysbiotic mice. Moreover, elevation of SOD2 expression, the major enzyme involved in detoxification pathways, confirms ongoing oxidative damage.

Conclusions: Vancomycin treatment induces early ultrastructural alterations of intermyofibrillar mitochondria in cardiomyocytes; (ii) TEM analysis is useful to detect ultrastructural alterations in absence of evident histological tissue damage; (iii) Hfiber diet can counteract the detrimental effect triggered by dysbiosis induced by antibiotics administration. Analysis of immune profile and BC features are ongoing.

No conflict of interest.

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254 (PB-070) Poster

Targeting proprotein convertase subtilisin/kexin type 9 (PCSK9), through an innovative virus-like particles (VLP)-based vaccine, enhance the antitumoral activity of a HER-2-VLP vaccine in a preclinical model of HER-2 positive breast cancer

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Background: A virus-like particles (VLP)-based vaccine against HER-2 (HER-2-VLP) showed promising therapeutic activity in human HER-2 transgenic mouse models, by significantly inhibiting tumor growth, without totally eradicating it (OncoImmunology, 7: e1408749).