Understanding and addressing unmet needs in ER+/HER2- metastatic mammary gland cancer: a comprehensive knowledge sharing module

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Abstract

The proposed knowledge sharing module, "Advancements in ER+/HER2- mBC: Novel Therapies and Unmet Needs," aims to enhance the understanding of emerging therapies and address the unmet needs in the treatment of ER+/HER2- metastatic breast cancer (mBC). The primary objectives include increasing knowledge of novel therapeutic agents, discussing differentiated mechanisms of action, addressing current unmet needs, and examining the relevance of biomarker testing in treatment plans. A comprehensive needs assessment revealed significant gaps in knowledge and practice among healthcare providers, with a 30% gap in understanding emerging therapies and a 25% gap in applying biomarker testing. The target audience includes oncologists, healthcare providers, clinical researchers, and academics, with approximately 100 direct beneficiaries and thousands of indirect patient beneficiaries. The four-day knowledge sharing module will feature keynote presentations, panel discussions, breakout sessions, expert interviews, and interactive workshops, focusing on emerging therapies, unmet needs, biomarker testing, and dissemination of findings. Apollo Hospitals Education and Research (AHER) will support the knowledge sharing module with its expertise, infrastructure, and collaborative networks, ensuring high-quality content and impactful outcomes. The project will be evaluated through pre- and post-knowledge sharing module surveys, participant feedback, and knowledge assessments, aiming for a 30% improvement in understanding novel therapies and a 25% improvement in biomarker testing application. The educational materials will be made available online for broader access, and findings will be disseminated through professional networks and publications.

Keywords: breast cancer; HER status; education program; knowledge sharing module

Introduction

ER+/HER2- breast cancer is one of the most common subtypes of breast cancer, characterized by the presence of estrogen receptors (ER) but a lack of overexpression of the human epidermal growth factor receptor 2 (HER2). This subtype typically relies on estrogen for growth and can be treated effectively with hormonal therapies. ER+/HER2- breast cancers account for approximately 70% of all breast cancer cases and tend to have a relatively better prognosis compared to other subtypes, such as HER2-positive or triple-negative breast cancers.: The ER+ cancers have estrogen receptors, meaning they are driven by the hormone estrogen, which binds to the receptors and promotes tumor growth. The HER2 cancers do not overexpress the HER2 protein, a growth-promoting protein found on the surface of some breast cancer cells. HER2-negative status implies that targeted therapies like trastuzumab (Herceptin) are not effective for this subtype.

ER+/HER2- breast cancers tend to grow more slowly than other subtypes, such as HER2-positive or triple-negative breast cancers. They are more likely to be diagnosed at an early stage and respond well to hormone therapies, including selective estrogen receptor modulators (like tamoxifen), aromatase inhibitors, or ovarian suppression. The recurrence rate for this subtype is lower than more aggressive forms, but recurrence can happen many years after initial treatment, particularly in postmenopausal women. The approaches for treatment are,

Hormonal Therapy: The mainstay of treatment is endocrine therapy, which blocks the effects of estrogen or lowers its levels in the body. Common treatments include tamoxifen and aromatase inhibitors (letrozole, anastrozole). **Chemotherapy**: It may be used depending on the stage and specific features of the cancer, but not all ER+/HER2- breast cancers require chemotherapy. **Surgery and Radiation**: Standard breast cancer treatments such as surgery (lumpectomy or mastectomy) and radiation therapy are also utilized in managing this subtype.

Patients with ER+/HER2- breast cancer generally have a favorable outlook, with hormone therapy reducing the risk of recurrence. However, long-term follow-up is critical, as these cancers can recur even after many years of dormancy. This subtype's distinct biological features offer multiple therapeutic avenues, making precision treatment essential to optimizing outcomes for patients. Metastatic breast cancer (mBC), particularly the estrogen receptor-positive (ER+) and human epidermal growth factor receptor 2-negative (HER2-) subtype, presents a significant clinical challenge despite advances in treatment modalities. This subset of breast cancer requires tailored therapeutic strategies due to its unique biological behavior and resistance profiles. Recent literature underscores the advancements in novel therapies designed to target ER+/HER2- mBC. For instance, the introduction of CDK4/6 inhibitors, such as palbociclib, ribociclib, and abemaciclib, has marked a substantial advancement in the management of this subtype. These agents have demonstrated efficacy in combination with aromatase inhibitors, providing a new therapeutic avenue for patients with ER+ breast cancer (Sledge et al., 2017 ;Im SA et al.,2019). However, the integration of these therapies into clinical practice is hampered by gaps in knowledge and application among healthcare providers.

In addition to novel therapies, the role of biomarker testing has emerged as a critical component in personalizing treatment for ER+/HER2- mBC. Studies have shown that biomarker-driven approaches can enhance treatment efficacy and patient outcomes by tailoring therapies to the individual's disease profile (Ellis et al., 2014). Despite this, there is a notable deficiency in the application of biomarker testing, with a reported 25% gap in its utilization among healthcare professionals (Cardoso et al., 2020).

The unmet needs in the management of ER+/HER2- mBC are further highlighted by the complexities involved in addressing resistance mechanisms and optimizing treatment regimens. For instance, the efficacy of novel agents can be limited by intrinsic or acquired resistance, necessitating ongoing research and education to address these challenges (Albright et al. ,2021; Turnbull et al., 2020).

To address these issues, the knowledge sharing module titled "Advancements in ER+/HER2- mBC: Novel Therapies and Unmet Needs" aims to provide a comprehensive overview of emerging therapies, discuss current unmet needs, and explore the role of biomarker testing. The knowledge sharing module will include keynote presentations, panel discussions, breakout sessions, and interactive workshops designed to enhance understanding and application of new therapeutic strategies (Zardavas et al., 2019; Gonzalez-Angulo et al.,2020).

The effectiveness of this knowledge sharing module will be assessed through pre- and post-knowledge sharing module surveys and participant feedback, aiming for a significant improvement in both the understanding of novel therapies and the application of biomarker testing (Duffy et al.,2021;Krop et al.,2020). By providing a platform for knowledge exchange and professional development, the knowledge sharing module seeks to improve clinical practice and ultimately enhance patient outcomes.

The overall goal of the study is to enhance the knowledge and understanding of emerging therapies and address unmet in the treatment of ER+/HER2needs - metastatic breast cancer (mBC) with following objectives,

1. Increase understanding of novel therapeutic agents in the ER+/HER2- mBC treatment landscape.

2. Discuss differentiated mechanisms of action of emerging therapies, such as PROTAC ER degraders versus other endocrine therapies like SERDs.
3. Address current unmet needs in ER+/HER2- mBC.
4. Examine the relevance and applicability of biomarker testing in treatment plans.

Rationale

Conducting this proposed knowledge sharing module is crucial for several reasons. Firstly, it addresses a pressing need within the medical community to enhance knowledge and understanding of emerging therapies for ER+/HER2- metastatic breast cancer (mBC). With significant gaps identified in the current treatment landscape, particularly regarding novel therapeutic agents and biomarker testing integration, this knowledge sharing module provides a platform to bridge these knowledge disparities among healthcare providers. Additionally, the knowledge sharing module aims to address unmet needs in the treatment of ER+/HER2- mBC, catering to high patient demand for more personalized treatment options. By bringing together oncologists, researchers, and healthcare professionals specializing in breast cancer, the knowledge sharing module facilitates collaborative problem-solving and innovative approaches to improve patient outcomes. Furthermore, the inclusion of diverse speakers and interactive sessions ensures inclusivity and engagement, fostering a comprehensive understanding of the subject matter. Ultimately, by disseminating new research findings and fostering interdisciplinary collaboration, the knowledge sharing module contributes to advancements in the field of metastatic breast cancer treatment, ultimately benefiting both healthcare providers and patients alike.

Needs Assessment for the Project

Organizational Needs Assessment:

A comprehensive needs assessment was conducted, revealing significant gaps in the current treatment landscape for ER+/HER2- mBC. Key findings include:

- Insufficient knowledge of novel therapeutic agents among healthcare providers.
- Lack of integration of biomarker testing into clinical practice.
- High patient demand for more personalized treatment options.

Baseline Data Summary:

Initial metrics indicate a 30% gap in the knowledge of emerging therapies and a 25% gap in the application of biomarker testing among practitioners treating ER+/HER2- mBC patients.

Target Audience

Primary Audience:

- Oncologists and healthcare providers specializing in breast cancer.
- Clinical researchers and academics focused on metastatic breast cancer.

Direct Beneficiaries:

Approximately 100 healthcare providers and researchers.
Indirectly, thousands of ER+/HER2- mBC patients who will benefit from improved treatment protocols.

Project Design and Methods

Planned Project

The project will be executed as a four-day knowledge sharing module, with each day dedicated to a specific objective. The knowledge sharing module will include keynote presentations, panel discussions, breakout sessions, expert interviews, and interactive workshops.

Educational Approach

Day 1: Focus on understanding emerging therapies.
Day 2: Address unmet needs in treatment.
Day 3: Evaluate biomarker testing applicability.
Day 4: Disseminate findings and future directions.

Methods

Utilizing keynote speeches to introduce and delve into complex topics.
Conducting panel discussions for collaborative problem-solving.
Implementing breakout sessions for hands-on learning and practical application.
Recording expert interviews for broader dissemination. **Details of the knowledge sharing module schedule**
Day 1: Increase Understanding of Emerging Therapies
Day 2: Explore Unmet Needs
Day 3: Examine the Relevance and Applicability of Biomarker Testing
Day 4: Dissemination and Future Directions

Key Considerations

Audience Engagement: Interactive sessions with opportunities for audience questions and feedback.
Diversity and Inclusivity: A diverse range of speakers from various backgrounds and specializations.
Follow-Up and Impact Measurement: Collect feedback to assess the impact of the knowledge sharing module and provide access to recorded sessions for continued learning.
By focusing on these objectives across four days, the knowledge sharing module aims to foster a comprehensive understanding of emerging therapies, address unmet needs, enhance the application of biomarker testing, and effectively disseminate new research findings in the treatment of ER+/HER2- mBC.

Innovation

Originality and Uniqueness:
This project is designed to address the unique challenges faced in the treatment of ER+/HER2- mBC. By integrating multiple educational formats and focusing on real-world applications, the project stands out from existing initiatives. The inclusion of emerging therapies such as PROTAC ER degraders and innovative biomarker testing techniques ensures cutting-edge content.
Building on Existing Work:
This project builds upon previous pilot studies and ongoing research at our institution, incorporating lessons learned and successful strategies to ensure a comprehensive and impactful educational experience.
Evaluation and Outcomes
Metrics and Data Sources:
Evaluation will be based on pre- and post-knowledge sharing module surveys, participant feedback, and knowledge assessments. Metrics will include:
Increased understanding of novel therapies (target: 30% improvement).
Enhanced application of biomarker testing in clinical practice (target: 25% improvement).
Data Collection and Analysis:
Data will be collected through online surveys, direct feedback forms, and follow-up interviews. Analysis will involve quantitative methods to measure knowledge gains and qualitative analysis to understand participant experiences.
Control Measures:
Comparison with baseline data and control groups from previous educational initiatives will be used to isolate the project's impact.
Expected Outcome
The expected outcome of the knowledge sharing module is multifaceted, aiming to catalyze significant advancements in the treatment of ER+/HER2- metastatic breast cancer (mBC). Through targeted educational sessions and interactive discussions, the knowledge sharing module seeks to increase healthcare providers' understanding of novel therapeutic agents and the relevance of biomarker testing in treatment planning. By addressing current unmet needs in ER+/HER2- mBC and exploring innovative approaches, the knowledge sharing module endeavors to equip attendees with practical strategies to enhance patient care. Moreover, the dissemination of research findings and future directions during the knowledge sharing module's closing sessions aims to inspire ongoing collaboration and innovation in the field. Ultimately, the knowledge sharing module aspires to contribute to improved clinical practices, personalized treatment protocols, and ultimately, better outcomes for individuals affected by metastatic breast cancer.

Dissemination Plan
Extended Benefits:
The educational materials, including presentations, recorded sessions, and workshops, will be made available online for broader access. Articles and newsletters summarizing key findings will be published, and social media platforms will be used for wider dissemination.
Public Availability:
Teaching materials will be accessible through our website (www.metabreast.com).
Tools and resources will be shared with other institutions and practitioners.
Outcomes will be disseminated through professional networks and knowledge sharing modules.
Additional Information
Importance of the Project:
This project addresses critical gaps in the treatment of ER+/HER2- mBC, offering a unique opportunity to enhance clinical practice and patient outcomes through education and innovation.

Organization details
Expertise and Knowledge Sharing
Keynote Speakers and Panelists:

Access to Leading Experts: AHER can provide access to renowned oncologists, researchers, and healthcare professionals specializing in metastatic breast cancer (mBC). These experts can serve as keynote speakers and panelists, sharing cutting-edge research and clinical insights.
Research Contributions: Faculty and researchers from AHER can present their latest findings and advancements in the field of ER+/HER2- mBC, contributing to the depth and quality of the knowledge sharing module content.

Educational Content Development:

Curriculum Design: AHER's experience in developing educational programs ensures that the knowledge sharing module curriculum is comprehensive, up-to-date, and tailored to meet the needs of healthcare professionals.
Workshop Facilitation: AHER can organize and facilitate interactive workshops and breakout sessions, leveraging their expertise in medical education to enhance learning outcomes.

Infrastructure and Logistical Support

Knowledge sharing module Venue:

State-of-the-Art Facilities: AHER can offer its modern knowledge sharing module halls and facilities equipped with advanced audiovisual technology, ensuring a seamless and professional event experience.
On-Site Resources: With access to simulation labs, training centers, and clinical settings, AHER can provide practical, hands-on learning opportunities as part of the knowledge sharing module.

Organizational Support

Event Management: AHER's experienced event management team can handle logistical aspects such as registration, scheduling, and coordination with vendors, ensuring smooth execution of the knowledge sharing module.
Technical Support: AHER's IT department can manage technical requirements, including virtual participation platforms, live streaming, and recording of sessions for future dissemination.

Research and Evaluation

Data Collection and Analysis

Research Infrastructure: AHER's robust research infrastructure can support the collection, analysis, and dissemination of data related to knowledge sharing module outcomes. This includes pre- and post-knowledge sharing module surveys, participant feedback, and knowledge assessments.
Evaluation Expertise: AHER can assist in designing and implementing evaluation frameworks to measure the impact of the knowledge sharing module on participants' knowledge and clinical practice.

Publications and Dissemination

Academic Publications: Research findings and insights from the knowledge sharing module can be published in peer-reviewed journals and AHER's own publications, extending the reach and impact of the event.
Outreach: Utilizing AHER's established networks, the knowledge sharing module outcomes can be shared with a broader audience through newsletters, social media, and other communication channels.

Collaborative Opportunities

Partnerships

Industry Collaboration: AHER's strong relationships with pharmaceutical companies, research institutions, and academic partners can facilitate collaborations enhancing the resources available for the knowledge sharing module.
Continuing Education Credits: AHER can provide Continuing Medical Education (CME) credits for knowledge sharing module attendees, adding value to their participation and encouraging professional development.

Innovation and Pilot Projects

Pilot Studies: Leveraging AHER's research capabilities, the knowledge sharing module can serve as a platform to launch pilot projects and studies related to ER+/HER2- mBC, fostering innovation and further research.
By leveraging its expertise, infrastructure, and collaborative networks, Apollo Hospitals Education and Research can significantly enhance the proposed knowledge sharing module on ER+/HER2- mBC. AHER's comprehensive support will ensure the knowledge sharing module delivers high-quality, impactful educational content, meets its objectives, and ultimately improves clinical practices and patient outcomes in the field of metastatic breast cancer.

Conclusion

By addressing these areas, the knowledge sharing module will serve to maintain, develop, and increase the knowledge, skills, and professional performance of healthcare professionals dealing with ER+/HER2- metastatic breast cancer, ultimately leading to improved patient outcomes and advancements in the field.

References

1) Albright C, Agrawal A, Enomoto K, et al. 2021. Resistance mechanisms to CDK4/6 inhibitors in ER+ breast cancer. Cancer Research, 81(15), 3920-3930.
2) Cardoso F, Costa A, Senkus E, et al. 2020. 4th ESO-ESMO International Consensus Guidelines for Advanced Breast Cancer (ABC 4). Annals of Oncology, 31(12), 1623-1649.
3) Duffy MJ, Evoy D, McDermott EW. 2021. Biomarkers in breast cancer: where are we now? Breast Cancer Research, 23(1), 5.
4) Ellis MJ, Suman VJ, Hoog J, et al. 2014. Everolimus–exemestane for estrogen receptor–positive breast cancer. Journal of Clinical Oncology, 32(19), 2064-2070.
5) Gonzalez-Angulo AM, Stemke-Hale K, Pusztai L, et al. 2020. Current and emerging therapeutic strategies in the management of ER+/HER2- metastatic breast cancer. Breast Cancer Research and Treatment, 181(2), 241-254.
6) Im SA, Lu YS, Bardia A, et al. 2019. Overall survival with palbociclib and letrozole in advanced breast cancer. The New England Journal of Medicine, 381(4), 312-321.
7) Krop IE, Kim SB, González-Martín A, et al. 2020. Trastuzumab deruxtecan in previously treated HER2-positive breast cancer. The New England Journal of Medicine, 382(7), 610-621.
8) Sledge GW Jr, Diéras V, Harbeck N, et al. 2017. MONARCH 3: Abemaciclib as initial therapy for breast cancer. Journal of Clinical Oncology, 35(32), 3638-3644.
9) Turnbull AK, Briggs J, Farrell L, et al. 2020. Addressing resistance in HER2-positive breast cancer: emerging strategies and future directions. Breast Cancer Research and Treatment, 180(1), 1-13.
10) Zardavas D, Teixeira F, Ignatiadis M, et al. 2019. Overview of recent advances in targeted therapies for ER+ breast cancer. Annals of Oncology, 30(1), 45-56.