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Knowledge Translation for Implementation of Point-of-Care Technology (POCT) in Breast Cancer Survivors in Africa

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Abstract

Background: Obesity and mediators of inflammation have been identified as the most important risk and predictive factors in postmenopausal breast cancer survivors (BCS) using aromatase inhibitors (AIs). Data is lacking on the effects of AIs on clinical, biomedical and genetic markers among postmenopausal BC women in the African settings.

Purpose: To assess the feasibility of probe genotyping adjunctive to standard care for timely prediction and diagnosis of AI-associated adverse events in breast cancer survivors in Africa.

Methods: Cross sectional study was conducted to assess the knowledge of POCT among six African countries using online survey and telephonically contacted. Incremental cost effectiveness ratio (ICER) was calculated, using diagnostic accuracy study. This was based on mathematical modeling.

Results: One hundred twenty-six participants were considered for analysis (mean age = 61 years; SD = 7.11 years; 95%CI: 60-62 years). Comparison of genotyping from HyBeacon probe technology to Sanger sequencing showed that sensitivity was reported at 99% (95% CI: 94.55% to 99.97%), specificity at 89.44% (95% CI: 87.25 to 91.38%), PPV at 51% (95%: 43.77 to 58.26%), and NPV at 99.88% (95% CI: 99.31 to 100.00%). Based on the mathematical model, the assumptions revealed that ICER was R7 044.55.

Conclusion: HyBeaco probe genotyping for AI-associated adverse events is cost effective in Africa. The barriers for implementation of POCT application among six African countries for diagnosis of breast cancer included governance issues, insufficient awareness and insufficient trainings, lack of lab equipment's, insufficient funding's and ethical guidance issues for conducting genetic testing's in African context.

Keywords: Aromatase inhibitors; Point of care testing, Postmenopausal breast cancer; cardiovascular risk factors

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Introduction

This review provides a summary of POCT trends, including technologies that have been approved or cleared by the Food and Drug Administration or are currently in development [1, 2]. The included technologies have either affected current clinical diagnostics applications (such as targeted nucleic acid testing and continuous monitoring) or are likely to affect the delivery of diagnostics in the near future. The applications of in vitro diagnostics are the only ones that are covered, but because of their similarity to in vitro diagnostics, some sections also cover technologies that don't involve in vitro diagnostics (such as ultrasound plug-ins for mobile phones). For advancements being developed (wearable's, harmless testing, mass spectrometry and atomic attractive reverberation, paper-based diagnostics, nanopores-based gadgets, and computerized microfluidics), we additionally talk about their likely clinical applications and give viewpoints on methodologies past innovative and insightful

evidence of idea, with the ultimate objective of clinical execution and effect. New clinical or consumer products and research and development directions show that the POCT field has grown rapidly over the past decade [3]. These and future POCTs may have a significant impact on care delivery, outcomes, and costs when used in conjunction with the appropriate strategies for clinical needs assessment, validation, and implementation.

Discussion

Clinicians have access to quick and actionable diagnostic results thanks to point-of-care technology, or POCT2. The shift from reactive, sporadic, and volume-based care to preventive, coordinated, and value-based care is being driven by new reimbursement and regulatory requirements in the current healthcare landscape. The ability to diagnose and monitor diseases at the POC is becoming increasingly important for the prevention of acute admissions and readmissions, chronic disease, and population health [4, 5]. From the patient's perspective, the need for user-friendly, analytically valid, and clinically valid POCT in telemedicine is driven by healthcare consumerism and an increased desire to participate in one's own health management. POCT, which enables remote diagnosis and monitoring, takes center stage in light of these requirements. As evidence of the market's requirements and acceptance of these technologies, a number of vital signs monitoring devices have been commercialized and widely used in the consumer market. The Apple Watch (heart rate and heart rhythm) and the Vitalpatch (eight vitals) are two examples [6]. Beyond vital signs, the menu of analytes is being expanded, as will be discussed in the following sections. At the same time, the use of artificial intelligence (AI) and data analytics for data mining in order to make a quick and accurate diagnosis and the integration of POCT data into electronic health records are gaining importance. These possibilities have the potential to become a reality thanks to a number of the technology trends discussed here. Mix of POCT with these stages likewise makes information accessible on a cloud-based server for telemedicine. Making these data accessible outside of a specific hospital or device will pave the way for future advancements, despite the absence of a standardized path for their integration into routine medical records [7, 8]. Apple as of late declared that the iOS11.2 beta adaptation of the Wellbeing application will coordinate clinical records from various medical clinics, including subtleties of sensitivities, conditions, inoculations, lab results, prescriptions, systems, and vitals that can be shared by clients. In the imagined future, clients may likewise decide to coordinate and share their POCT results [9, 10].

Conclusion

During an infectious disease outbreak, obtaining the genetic sequence of a target organism at the POC provides useful epidemiological data. Information from a sequence can be used to identify the organism's susceptibility and speciation. In the last ten years, a number of devices for sequencing nucleic acids have been put on the market. These include handheld nanopore-based systems like the Molecular Meter (Two Pore Guys) or smartphones that can be plugged into a USB port (such as the Oxford Nanopore Technology MinION and SmidgION® analyzers, respectively); a system that uses pH-sensitive field effect transistors, such as LiDiaTM (DNA Electronics) and a semiconductor chip-based electronic sequencing system that does not use labels (Gene Electronic Nano-Integrated Ultra-Sensitive (GENIUS) platform, or GenapSysTM) The Food and Drug Administration (FDA) has not yet cleared or approved any of these technologies for diagnostic use.

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Conflict of Interest

Author declares no conflict of interest

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