HHS Public Access

Author manuscript

Int J Gynecol Cancer. Author manuscript; available in PMC 2023 December 05.

Published in final edited form as:

Int J Gynecol Cancer. ; 32(12): 1632–1633. doi:10.1136/ijgc-2022-003959.

HPV mRNA testing in cervical cancer screening: implications for low and middle-income countries

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Keywords

screening; prevention; implementation science; cervical cancer; global oncology

Although cervical cancer is preventable, poor access to screening is associated with a large global burden, particularly in low- and middle-income countries, where ~87% of deaths and ~84% of cervical cancer cases occur annually [1]. Recent analyses have explored increasingly popular mRNA APTIMA or HPV DNA screening tests that may offer greater effectiveness [2]. APTIMA has an advantage since it has greater specificity and similar sensitivity compared to DNA tests and could become an accepted primary cervical cancer screening tool [2]. However, data and studies on APTIMA largely derive from high-income countries with populations of mainly European-descent and greater resources compared with populations from low- and middle-income countries who bear the majority of the global cervical cancer burden. Here, we discuss the implications of current mRNA APTIMA findings for low- and middle-income countries in Asia.

Many low- and middle-income countries in Asia do not have established screening programs and rely on visual inspection tests with acetic acid. The test's cost-effectiveness and faster results allow same-day interventions, which minimizes patient follow-up issues in low-resource settings [3]. However, visual inspection tests with acetic acid may be variable at times since it must rely on healthcare worker interpretations and may not be suitable in older women due to poorer visualization associated with ageing [3].

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APTIMA however, requires new HPV-based laboratory infrastructure and trained personnel, carefully calibrated temperature for reagents and samples during storage/transit, and proper handling of assays [4]. Additionally, since APTIMA self-sampling is not recommended [2], patients must travel to a clinic. Though APTIMA reports high specificity and has the potential to mitigate unnecessary procedures, the logistical difficulties facing many low- and middle-income countries in Asia may hamper APTIMA's effectiveness.

Currently, the vast majority of studies analyzing APTIMA [2] are often from high-income countries. For instance, a recent meta-analysis on APTIMA selected 80% of its studies and ~93% of its total sample size from developed countries [2]. Incorporation of more data from low- and middle-income countries would reframe the results of these studies to better reflect the effectiveness of APTIMA in resource-limited settings where the tool is used imperfectly. This is reflected in the variability of visual inspection tests with acetic acid reported sensitivity (37%-96%) and specificity (49%-98%), which has been studied to a greater degree in diverse settings.

How can we ensure that clinical effectiveness research better reflects the diverse and often imperfect settings in which new screening tools are implemented? First, developers of tests like APTIMA should include diverse global populations as they develop assays. Second, funding bodies should promote cervical cancer screening implementation research in areas where the burden is greatest. Accessibility in low- and middle-income countries must be considered to truly measure the applicability of new tests. Lastly, researchers should consider moving to effectiveness-implementation hybrid study designs to better capture real-world technology impact [5]. By also gathering real-life data on implementation, potential interventions can be put into practice more quickly and increase the policy relevance of clinical research [5]. While we agree that APTIMA could complement current screenings in low- and middle-income countries in the future, tests like APTIMA must be validated in diverse settings to avoid exacerbating global cervical cancer disparities.

Acknowledgments

This work is funded in part through the Cancer Center Support Grant from the National Cancer Institute (P30 CA008748). The authors declare no conflict of interests. No pharmaceutical company or other agency has paid any author to write this article. We thank Dr. Guru Suhas for providing his clinical perspective and for remarks that greatly improved the manuscript.

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