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Exploring Access to Cervical Cancer Screening Through At-home Self-collection and HPV Testing: Lessons Learned in the Two Rural Resource-Limited Settings of Southwest Virginia, USA and Bluefields, Nicaragua

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Background: Significant preventable morbidity and mortality are associated with cervical cancer, of which 70-90% of cases are caused by human papillomavirus (HPV). Early screening and detection of cervical lesions through Pap tests can significantly increase better health outcomes. However, barriers to screening in rural resource-limited settings are pervasive at the individual, family, community, and systems levels. This presentation aims to describe exploring the cultural acceptability and feasibility of increasing cervical cancer screening through at-home self-collection of HPV DNA samples, in two rural resource-limited settings: Southwest Virginia, USA and Bluefields, Nicaragua.

Methods: We analyzed data from two different research projects with similar aims in two different settings. In Southwest Virginia, three focus groups were conducted along with an environmental scan consisting of 50 telephone-based interviews. In Bluefields, Nicaragua, researchers conducted five focus groups and 12 key informant interviews as part of an environmental scan focused on describing available resources and current screening procedures. The Socio-Ecological model was used to guide data collection specific to barriers to current screening practices in each setting. All interviews were audio-recorded and transcribed verbatim. Transcripts were analyzed using thematic analysis, and interviews were analyzed in the language they were conducted in (English or Spanish).

Findings: In Southwest Virginia, results focused on community-member participation in developing feasible study procedures, as well as on provider-identified barriers to current cervical screening resources in the region. In Bluefields, researchers described the broader landscape of cervical cancer prevention and screening, with emphasis on barriers to current screening practices. Barriers in both settings were identified at the individual, family, community, and systems levels.

Interpretation: Rather than compare or contrast cultural acceptability or feasibility of at-home self-collection for HPV DNA testing in two very different cultures and locations, this analysis instead seeks to describe lessons learned via community-based participatory inquiry into two rural resource-limited settings. Cultural context has an inextricable link to the acceptability and feasibility of innovative screening modalities, and so must be assessed and integrated via community-based partnerships. Such lessons have the potential to impact future research and ultimately can impact culturally appropriate cervical cancer screening models.

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Association of Maternal Prenatal Stress, Methylation Changes in IGF-1 and IGF-2, and Birth Weight in Mother-Newborn Dyads

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Background: Maternal stress has been previously linked to low birth weight in newborns through various mechanistic theories. One theory, which draws from the developmental origins of health and disease paradigm, posits that epigenetic changes at certain candidate genes may occur as a result of prenatal maternal stress, leading to lower birth weight in infants. In this study, we sought to explore the potential association between prenatal stress, birth weight and methylation at two candidate genes related to newborn birth weight: IGF-1 and IGF-2. These two genes have been implicated in intrauterine and postnatal growth and development, although the underlying mechanistic pathways are likely different since IGF-2 is under imprinting control.

Methods: Twenty-four mother-newborn dyads living in the high conflict zone of the eastern Democratic Republic of Congo were enrolled. Detailed ethnographic interviews were conducted with mothers at the time of birth to gather culturally relevant chronic and war-related stressors. DNA methylation data were generated from maternal venous, placental and cord blood samples. Multivariate regressions were used to test for an association between stress measures, birth weight and methylation in each of the three tissue types.

Findings: We found a significant negative association between rape-related stress and cord blood IGF-1 methylation ($p = 0.0015$). We also found a significant positive association between IGF-2 methylation in maternal blood and birth weight ($p = 0.003$).

Interpretation: Extreme maternal stress may modulate the methylation patterns of IGF-1 in newborns, though the relationship between IGF-1 methylation and birth weight is less clear. It is possible that increased IGF-1 methylation may have more complex effects than simply lowering birth weight through decreased IGF-1 expression. In addition, the associations we found between maternal IGF-2 methylation and newborn birth weight have not previously been reported. As IGF-2 is an imprinted gene in which the maternal allele is usually silenced in offspring, these findings may represent a novel investigative focus for understanding the relationship between IGF-2 and birth weight.

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