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Comparison of conventional cytology and liquid-based cytology tests for cervical cancer screening in Kazakhstan

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Human papillomavirus (HPV) is responsible for almost all the cases of cervical cancer, which, in turn, ranks as the fourth most common female malignancy worldwide, accounting for 11% of woman deaths due to cancer. While the trends of mortality due to cervical cancer has been improved along the introduction of screening and HPV vaccination programs in many developed countries, Central Asian countries are still experiencing increases in mortality rates for the latest 10-year period. Despite the availability of the cytology-based cervical cancer screening program in Kazakhstan that was established in 2008, the country is estimated to have the second highest age-standardized mortality rate (9.8 per 10,000 women per year) across Central Asia. This situation is most probably associated with lack of quality assurance structures, which also results in limited data on the reliability of available screening tests. In Kazakhstan, both conventional cytology (CC) and liquid-based cytology (LBC), a comparatively new and expensive technology, are used as primary screening tests. Originally, LBC has been developed to offer improvements over CC such as increased sensitivity presumably due to more accurate preparation of the material as well as the ability to perform HPV testing on the same sample when indicated. Despite the number of institution-based reports and clinical trials suggesting these advantages of LBC, there are also studies showing insignificant difference in sensitivity of these two tests. Some studies also showed decreased specificity of LBC, which makes this test overall to be less cost-effective. The goal of this research is to compare the performance of CC and LBC in Kazakhstan by studying their reliability as one of the steps to optimize the cytology screening.

Methods: Cervical materials were obtained from 107 consenting female patients aged 30-60 in Kazakhstan who went through the cervical cancer screening. The material was obtained by cyto-brush, which was initially used to prepare pap smear samples for the CC test. The brush was then placed in a special fluid and used for the LBC test. A total of 214 samples were obtained and the CC and LBC reporting was done using Bethesda system. Samples were analyzed independently in two laboratories in Astana; one at the Republican Diagnostic Center and the other conducted at a private laboratory. The statistical analysis was performed by using STATA software.

Results: The mean age of the patients was 43.5±9.3 years old. The number of unsatisfactory results was 4.7% when performed with CC and 8.4% with LBC. The overall detection rate of abnormal cytology was significantly higher in CC than in LBC (33.3% vs. 18.3%, $p<0.02$). The low-graded squamous lesions (ASCUS and LSIL) were more detectable by CC method (24.5% vs. 19.4%, $p<0.02$).

Conclusion: The results suggest that LBC did not outperform CC in the detection of precancerous lesions in terms of clinical accuracy, which correlates with a number of previous studies. Moreover, LBC resulted in lower sensitivity, which questions its adequacy as a primary screening test.

Biography

Aidana Amangeldiyeva is a 3rd year medical student at NU School of Medicine, which is a US-style school of medicine in Astana, Kazakhstan. She did her bachelor degree in biological sciences at NU School of Science and Technology and had experience of working at National Laboratory of Astana in the area of personalized medicine. Currently, she is doing clerkship at National Research Centre of Mother and Child, where she is training in different specialties including Gynecology and Obstetrics.

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