Sun Xiaorong et al., J Cancer Sci Ther 2014, 6:10
http://dx.doi.org/10.4172/1948-5956.S1.033

OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on
Cancer Science & Therapy
October 20-22, 2014 DoubleTree by Hilton Hotel Chicago-North Shore Conference Center, USA

Population-based study of automated DNA image cytometry as a screening method for cervical cancer in rural areas of China

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Introduction: Worldwide, cervical cancer is the third most common cancer among women and over 85% of cervical cancer occurs in developing countries. It is estimated that China accounts for 14% of the world's annual incidence of cervical cancer and 12% of the world's annual mortalities related to cervical cancer. There is no national screening program for cervical cancer in China. Screening remains opportunistic and is centered in large cities. 60% of the Chinese population resides in rural areas, where 90% of incidents of cervical cancer cases might occur. These areas lack sufficient cytopathologists and cytotechnicians to interpretate Pap cytology specimens. The purpose of this study is to compare automated DNA Image cytometry (DNA ICM) and liquid-based cytology (LBC) as primary screening methods for cervical cancer and precancerous lesions.

Materials and methods: Our population-based screening program was made possible by the Wuhan government. 15 rural areas in Wuhan were selected for the study. Cervical samples from the women were collected by a brush and placed into a cytofixative solution. Two slides were prepared from each sample using a cytospin. The Papanicolaou method was used to stain one slide for manual cytology examination based on TBS criteria, while the other slide was stained with Feulgen for automated DNA ICM analysis. Cervical histological biopsies were performed on women whose Pap tests showed LSILs and above and/or when automated DNA ICM analyses reported at least 3 cells with abnormal aneuploidy (≥5C).

Results: A total of 181,455 women from rural areas in Wuhan were screened using both LBC and automated DNA ICM. The mean age of the women was 39 years, and the age range was 35 to 45 years. We compared the results of automated DNA ICM to those of LBC. The rate of positive detection by automated DNA ICM was 5.4% in women with negative Pap tests and 98.7% in women with HSIL Pap tests. 1,498 women had cervical histological follow-ups. Of these women, CIN1+ lesions were diagnosed in 525 cases (35.1%), including 7 cases of invasive cervical cancer (0.47%). The correlation between histological findings and LBC and automated DNA ICM results is being analyzed.

Conclusion: The preliminary results suggest that automated DNA ICM might be used in countries where it would be difficult to introduce population based cervical cancer screening due to the lack of cytopathologists and cytotechnologists.

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