

## Dynamic spectral imaging colposcopy

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Cervical cancer is the most common cause of death from gynecological cancer in developing countries, with a mortality rate ten times higher than that in developed countries. It represents the third most common cancer in women after breast and colorectal cancer, with 528,000 estimated cases in 2012, 84% of these in less developed countries<sup>1,2</sup>.

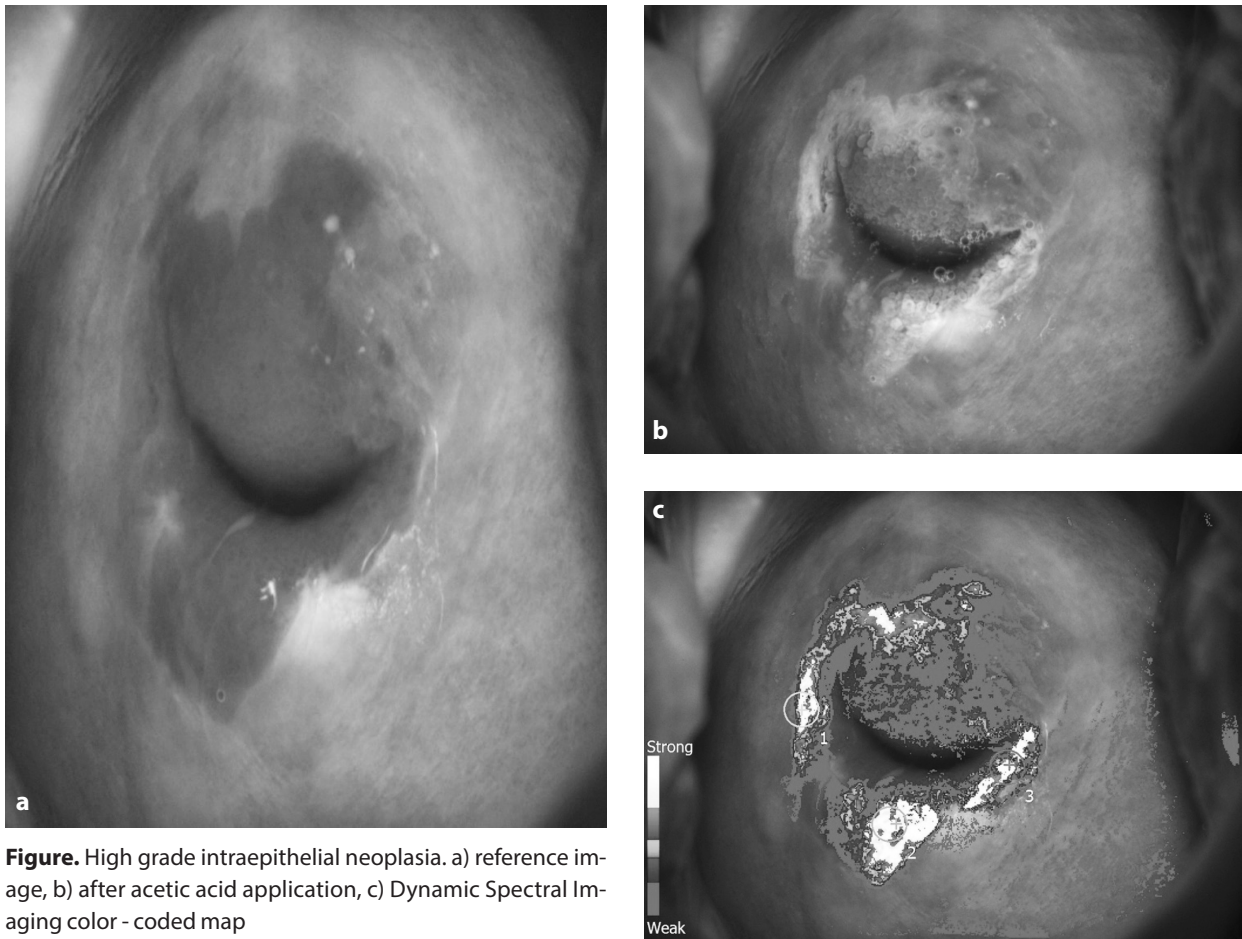
In terms of cervical cancer prevention the role of Pap smear remains unquestionable<sup>3</sup>. The Pap smear reflects a quick, easy, and relatively inexpensive method, which is used for screening all socioeconomic - level populations. Cervical cancer incidence rates have decreased dramatically since the implementation of the Pap smear screening. Nevertheless, the American Cancer Society estimates for 2013 predicted more than 12,000 new cases of cervical cancer in the United States<sup>4</sup>.

Colposcopy represents an alternative method concerning cervical cancer prevention. It refers to all abnormal cytological reports and abnormal cervical epithelial lesions. The final diagnosis is being established through histological confirmation of specimen collected from suspicious areas identified during colposcopy. During colposcopy, through the application of acetic acid, abnormal cervical epithelial lesions turn into white. This condition refers not only to intraepithelial neoplasias but also

to several physiologic and benign conditions. The ultimate scope remains the detection of these lesions and the establishment of a suitable treatment plan<sup>5</sup>

Due to low sensitivity (55 - 65%) and specificity (70 - 90%) of colposcopy, an improved procedure must be conducted<sup>6</sup>. The Dynamic Spectral Imaging System (DySIS, by DySIS Medical Ltd, Livingston, UK) focuses on improving the performance of standard colposcopy by offering an objective way to quantify and map the acetowhitening areas. The DySIS cervical mapping offers a better optical evaluation and decreases biopsy sampling errors<sup>7</sup>. When used in combination with all other colposcopic indicators, it can improve the ability of the colposcopist, concerning not only the detection of intraepithelial lesions but also benign conditions such as metaplasia, inflammation and cervical infection<sup>8</sup>. In previous clinical studies, the use of DySIS managed to increase the low sensitivity and specificity of conventional colposcopy by introducing the cervical mapping<sup>9</sup>.

The DySIS colposcope has digital imaging equipment capable of sufficient visualization of the cervix, using a variety of color filters. It is able to detect and map acetowhite changes that may be linked to cervical epithelial lesions and at the same time consider all the parameters such as intensity



**Figure.** High grade intraepithelial neoplasia. a) reference image, b) after acetic acid application, c) Dynamic Spectral Imaging color - coded map

and acetowhite persistence<sup>10</sup>. Color cervical mapping indicates with different colors the areas of suspicion based on their acetowhitening (Figure 1). Due to digital analysis, the colposcopist is able to correctly characterize abnormal areas, detect the difference between intraepithelial lesions and benign conditions, and select the biopsy locations accurately<sup>11</sup>.

In conclusion, DySIS appears to be a promising new technique for the evaluation of benign, low and high grade intraepithelial lesions. The increased sensitivity and specificity, in comparison with conventional colposcopy, provides assiduous cervical evaluation and mapping. ■

### Conflict of interest

All authors declare no conflict of interest.

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