

The PapCone® as a valid cervical sampling device: a comparative ultrastructural and semiquantitative study

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The efficiency of cervical cancer screening depends on the proper interpretation of results and on the quality of the sample. For a smear to be considered adequate, cell samples from the endocervix, transformation zone and ectocervix must be present. Our aim was to analyse cervicovaginal smears' with scanning electron microscopy (SEM), comparing the traditional Ayre's wooden spatula (Sp) and endocervical cytobrush (Cb) with a new cone-shaped polyurethane (foam) device, the PapCone® (Otto Bock, Duderstadt, Germany).

Pap tests were performed with the related informed consent in 22 adult fertile (aged 20-46) women using Sp and/or Cb; sampling with the PapCone® followed 3 months after. The apical extremity of each device was fractured and fixed in toto in 2.5% glutaraldehyde containing vials. Samples were stored at 4°C, postfixed in 1% osmium tetroxide, dehydrated, critical-point dried, mounted on aluminum stubs, coated with platinum, and observed with a Hitachi S-4000 FE-SEM. Statistical analysis was performed evaluating ecto-/endocervical cells, erythrocytes, and/or mucus contained in ten 250x-microscopic fields.

There were no significant differences in the number of ectocervical cells and in the quantity of mucus sampled when comparing the 3 devices. The PapCone® sampled significantly more endocervical cells with respect to Sp and Cb, and more erythrocytes with respect to the Sp. These latter data may be due to the characteristic porous and trabecular surface of the PapCone®, which samples a larger volume of material that tends to be also present in less overlapping layers. In conclusion, PapCone® is a better device with respect to Sp and Cb for sampling endocervical cells. Improved cervical sampling will certainly lead to better quality smears and hopefully decrease both false negative and inadequate smear rates.

Keywords: Pap test, uterine cervix, scanning electron microscopy, cervical cytology, transformation zone, endocervical cells