Preliminary assessment of CellSolutions System for preparing thin-layer Pap smears

Arrigo Bondi, Paola Pierotti*, Paola Crucitti*, Stefania Lega*, Roberta Rapezzi*, and Giuseppina Ferro**

**Department of Pathology, Maggiore Hospital, Bologna Italy*

Background

A new method for preparing thin-layer Pap smears has recently been perfected and named CellSolutions System (**CS - Menarini Diagnostics**).

Fig. 1: Conventional Pap smear and CellSolutions single layer preparations. Darker areas in conventional cell clusters are problematic under microscope observation, because they are not transparent to light. These clusters are not present in the monolayer preparation, greatly improving the readability of the microscope.

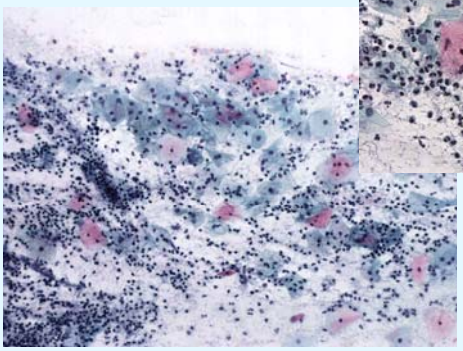

Fig. 2: Conventional Pap smear: bacillary and granulocyte population are a rich component of the background.

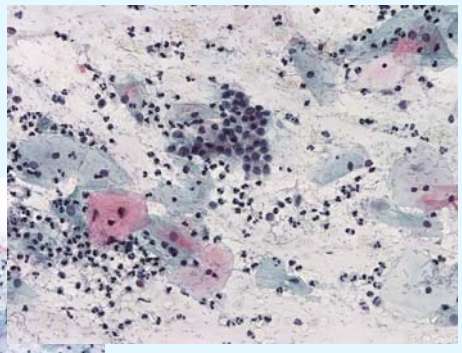

Fig. 3: higher magnification conventional Pap smear: a group of well-structured endocervical cells. These groups are easily found in thin layer preparations. It can be noted a rich population of Doderlain bacilli around the cells.

Methods

The cells withdrawn from the cervix are dispersed in an alcohol-based fixative agent (liquid phase), an aliquot is subjected to conventional centrifugation and the sediment is re-suspended in a dense liquid ("Glucyte") that serves for evenly spreading the cells and gluing them onto the histology slide, in a defined area measuring 20 x 15 mm. A mechanical instrument has also been developed for automating and speeding up preparation.
In order to test the efficiency of CS, 100 screening cervical-vaginal samples withdrawn with the Ayre spatula and Cytobrush are examined: after spreading these on a histology slide for preparing the conventional Pap smear, both instruments are washed in fixative liquid that is then used to prepare the thin-layer slide (split-sampling technique). In this way two preparations are obtained for microscopic investigations, one conventional and the other thin-layer.

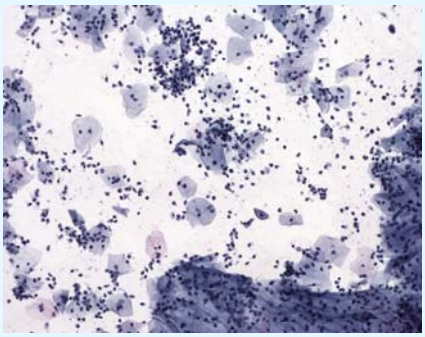

Fig.4: Thin layer CS preparation from the same sample of the conventional one (see Fig. 2-3). Eosinophilic cells (in pink) are much less evident respect to conventional smear.

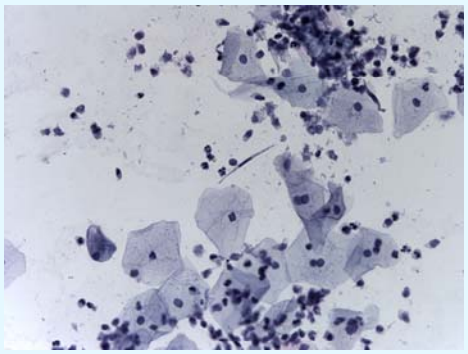

Fig.5: same preparation of Fig.4, higher magnification. Space between cells is less populated than conventional (compare with Fig. 3).
It can be noted Doderlain bacilli, granulocytes and thin stretched cells, needle-like or filamentous, such as in the middle of picture.

Results

The cell morphology in CS preparations is well preserved, fixation is good and the interpretation is quite easy. The space between the cells (bottom) is moderately populated by the same objects as in conventional preparation (Doderlain, spore, debris …) and even small fusiform cells can be appreciated. Erythrocytes are absent.

Screening Pap smears: reporting comparison — Tab.1

Conventional	CellSolutions Negative	CellSolutions LSIL	CellSolutions HSIL	CellSolutions Inadequate	Total
Negative	93				93
LSIL		2			2
HSIL			1		1
Inadequate	1			3	4
Total	94	2	1	3	100

Same cases studied with conventional and CellSolution method (split-sampling technique)

Conclusion

CS represents a conceptually new and easy way to produce thin layer cytological preparation from liquid samples.
Screening samples have too low variability to asses diagnostic reproducibility; nevertheless CS didn't miss the positive cases observed with conventional method.