

COMPARISON OF NYLON SWABS VERSUS COTTON SWABS FOR THE DIAGNOSIS OF HERPES SIMPLEX VIRUS

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I INTRODUCTION:

The herpes simplex virus (types 1 and 2) can be diagnosed rapidly using fluorescent antibody assays to detect viral antigens from cell samples. Cells for the assay can be collected with a swab from blisters, lesions or mucosal membranes.

The sensitivity of the assay, however, is related to the number of cells available for microscopic inspection. The type of swab used for cell collection is the most important factor determining the amount of cells ultimately recovered from the sample.

This study compared the performance of two types of swabs: a standard rayon cotton swab and a novel flocked swab (Copan Italia) with the aim of increasing the sensitivity of diagnosing herpes simplex virus from cell samples. The hypothesis of the study was that the more efficient design of the flocked swab (figure 1) would yield more cells than the conventional device.

2 MATERIALS AND METHODS:

A total of 88 concurrent throat samples were collected with both swabs from patients of the children's clinic of the Hospital district of Helsinki and Uusimaa. All study patients were children with malignant hematological disorders. The cells were released from the swabs by vortexing thoroughly in sample suspension and attached on a preparative glass by cytospinning. Herpes simplex virus antigens were detected using an indirect immunofluorescence antigen assay by a polyclonal rabbit antiserum (Dako Cytomation) detecting both of the two virus types. The number of cells on each glass was subjectively estimated with a number scale ranging from 0 to 5 (0=no cells, 5 = very large number of cells).

3 RESULTS

Using the flocked swab resulted generally in higher cell yields than the cotton swab (table 1 & figure 2). Of the cotton swab-derived slides only 23.9% were good or excellent whereas almost half (49.7%) of the slides prepared from nylon swabs were good or excellent. Two samples taken with cotton swabs contained no cells whereas no slides prepared with the nylon swabs were entirely cell-free.

The swabs were also assessed with a questionnaire of the personnel taking the samples about the usability of the swabs compared to each other. Generally, the more rigid shaft of the cotton swab became preferred over the more flexible plastic shaft of the flocking swab because of a better grip.

4 CONCLUSIONS

In summary, the new flocked swab design yielded significantly more cells for the immunofluorescence antigen assay of Herpes simplex virus. The increased amount of cells is directly related to an increased sensitivity of the assay. The results also have implications for all assays utilising swabs for sampling blisters, lesions, mucosal membranes or other similar surfaces.

Figure 1. A regular cotton swab versus a Copan flocked swab

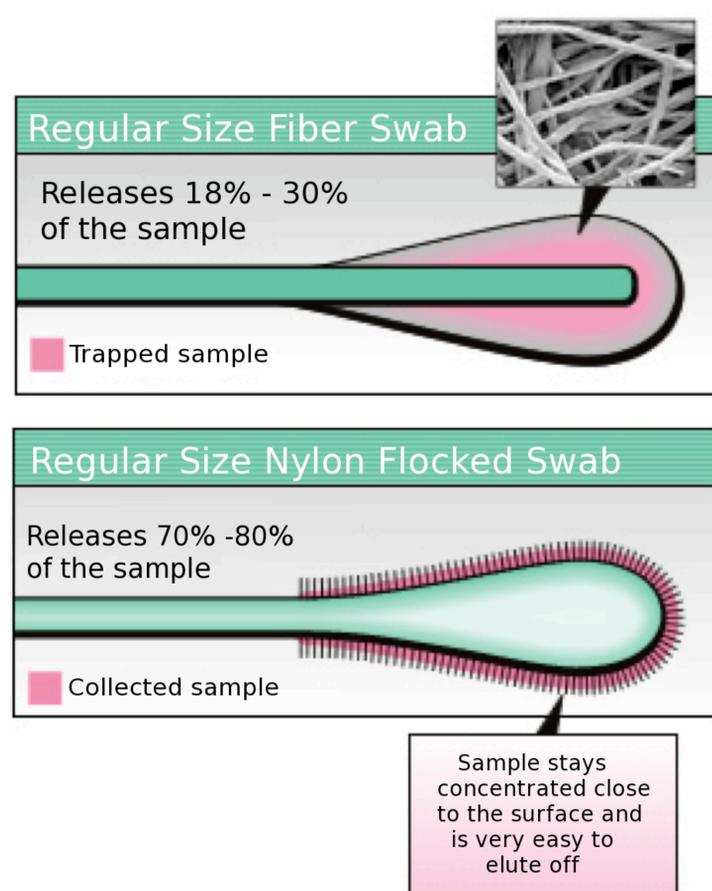


Table 1. Cell yield among patients sampled by mucosal throat samples using flocked or rayon swabs

TYPE OF SWAB	NO CELLS (0)	SCANTY (1)	PASSABLE (2)	SATISFACTORY (3)	GOOD (4)	EXCELLENT AMOUNT OF CELLS (5)
COTTON SWAB	2.0	14	26	25.0	17.0	4.0
FLOCKED NYLON SWAB	0.0	8	9.0	29.0	27.0	15.0

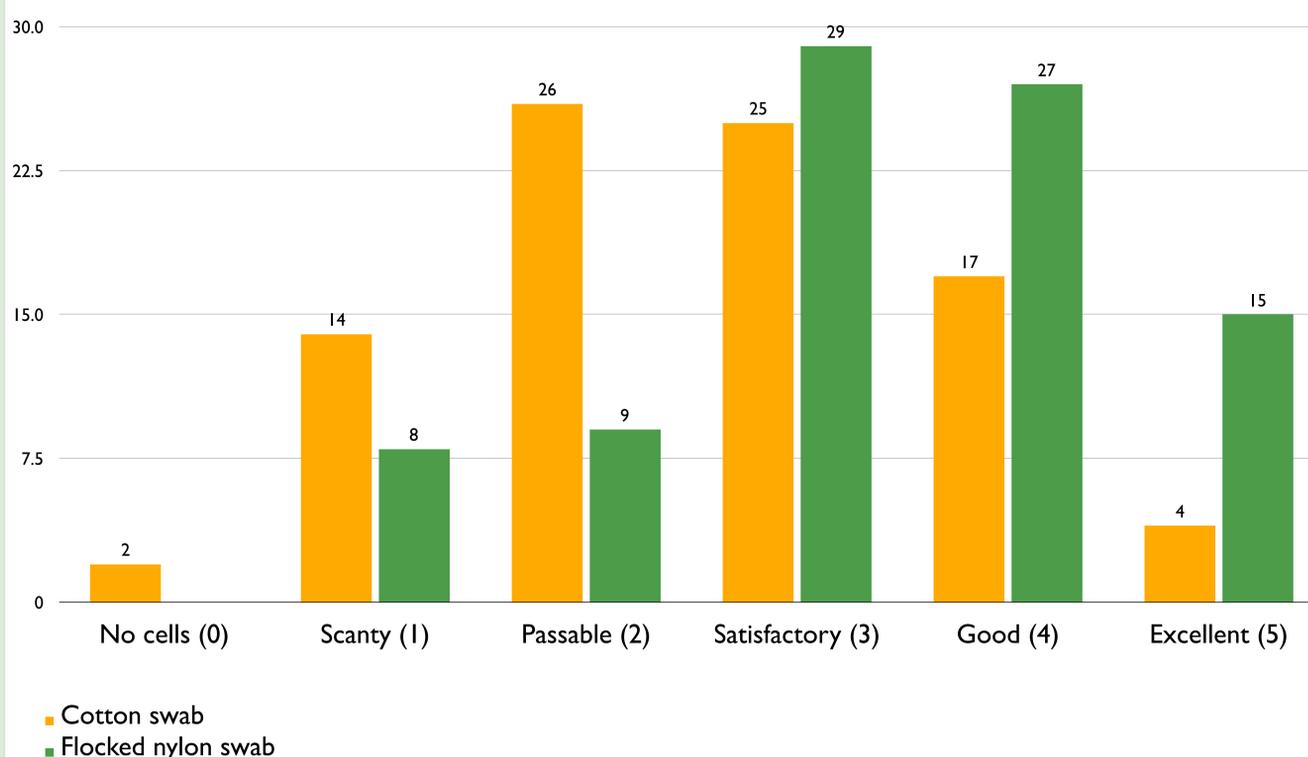


Figure 2. A comparative bar chart of cell yield with both swabs