Effect on Detection of Various Cervical Lesions Using the Combined Spatula and Cytobrush Sampling Method

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I. Introduction

Recently, we published our results concerning the consequences of the introduction of the combined spatula and Cytobrush sampling for cervical cytology (Boon, et al., 1987). It concerned smears made by general practitioners. The method for sampling is illustrated in Fig. 1. It is clear that the Cytobrush reaches a higher point in the endocervix than the spatula: the spatula is used to sample the ectocervix. Our goal was to receive a larger proportion of "representative smears", that are smears containing cells from the transformation zone. Here the epithelium is predetermined for neoplastic change. When the benign cells from the transformation zone are missing in the sample, there is a chance that also the malignant lesion was not sampled. In that case we have a false negative smear. Probably the false negative rate is quite high in spatula smears. In the screening program in Sweden 45 percent of the invasive carcinomas were diagnosed within five years after the first negative smear (Boon, et al., 1987). This high percentage is partly due to sampling errors in the first screening.

In The Netherlands, when a smear is not representative, the advice is given to take a new smear. As a result, the percentage of repeat smears is quite high: in 1985 it was 32% for general practitioners. So it certainly seems worthwhile to try new sampling methods.

Indeed, with the introduction of the spatula-Cytobrush method the percentage of representative...
smears increased to close to 100. More importantly, the rate of cytologic positive cases increased significantly.

In this paper we present the results in an extended material, and we focus on the question whether there were differences in the rates of the various grades of squamous lesions.

II. Material and methods

For this study, 7,531 spatula-Cytobrush smears were available, and 33,668 spatula-alone smears. All smears were taken by general practitioners. In this material, the rates of slight dysplasia, severe dysplasia and carcinoma in situ were calculated. The diagnostic criteria for these lesions can be found in Boon and Tabbers-Boumeester (1980).

III. Results

The results are presented in Table 1. In the squamous lesions, for the higher grades (severe atypical reserve cell hyperplasia, severe dysplasia, and carcinoma in situ) the effect of the introduction of the spatula-Cytobrush method was clear, while for the slight dysplasia the rate hardly increased.

IV. Discussion

The localisation of the various squamous lesions differ: Burghardt (1970) showed that dysplastic

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Comparison of positivity rates in spatula-Cytobrush smears and in Spatula-alone smears</th>
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<tbody>
<tr>
<td></td>
<td>combined with the Cytobrush</td>
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<tr>
<td>slight dysplasia*</td>
<td>n = 7,531</td>
</tr>
<tr>
<td>severe atypical reserve cell hyperplasia*</td>
<td>0.97</td>
</tr>
<tr>
<td>severe dysplasia*</td>
<td>0.37</td>
</tr>
<tr>
<td>carcinoma in situ*</td>
<td>0.39</td>
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<td></td>
<td>0.14</td>
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A combination of diagnosis can be found at one patient
lesions are often found on the ectocervix, while carcinoma in situ is frequently encountered in the endocervical canal. This explains why we observed a major improvement in the detection of the more severe lesions, while the detection of slight dysplasia hardly increased. So sampling of the endocervix is essential for the efficacy of screening for cervical carcinoma.

The collection of samples from the endocervical canal is not new in itself: often a moistened cotton tip applicator is used for this purpose. Rubìo (1981) showed that a lot of material is trapped in the network of cotton fibers and thus lost for diagnostic evaluation. Both the sampling of the endocervical zone as the cell preservation is better with the Cytobrush. In our experience, having screened over 10,000 spatula-Cytobrush smears, the Cytobrush part of the smear is excellent indeed, and in positive cases there are many tumor cells facilitating the cytologic diagnosis. It dislodges atypical epithelium lining endocervical clefts.

To take a spatula-Cytobrush smear costs slightly more time than to take a spatula-alone smear. If the spatulas and Cytobrushes are sent to the doctors in separate boxes, in only 35% of the cases the Cytobrush is used to make the smear. The additional disadvantage of sending boxes of spatulas to doctors is: The spatulas are often put in a container and thus stand unprotected against contamination on the doctors' desk (Fig. 2a). When the doctors are sent sets, each containing one spatula and one Cytobrush (Fig. 2b), almost all smears are made with the combined spatula-Cytobrush method. An additional advantage of these sets is that both spatula and Cytobrush are protected by plastic. So, when the aim is to encourage the doctors to apply this method, attention should be given to how the Cytobrushes are supplied.

Summary

With the introduction of the combined spatula-Cytobrush sampling method, the percentage of representative smears (containing endocervical cells) rose from 68 to 99%, and the rate of cytologic positive cases increased significantly.

Both effects can be explained by the efficient endocervical sampling of the Cytobrush: first, it reaches higher parts of the endocervical canal, and, second the bristles of the brush dislodge atypical epithelium lining the endocervical clefts.

In the current paper is shown that the increase in detection rate depends on the type of cervical lesion. For slight dysplasia (mainly located on the ectocervix) the increase was nil, whilst in the more severe preneoplastic lesions (mainly situated in the endocervix) the increase was 1.5 till 2.4.

So Cytobrush sampling is essential for the efficacy of detection the more severe preneoplastic lesions.

References

1) Boon, M.E., Alons-van Kordelaar, J.J.M. and Rietveld-Scheffers, P.E.M.: Consequences of the introduction of


