THE DETECTION OF hrHPV-INFECTION OF THE CERVIX USING FIRST-VOID URINE IN WOMEN WITH AN ABNORMAL PAP-SMEAR

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Aim

•To determine the sensitivity and specificity of morning first-void urine for HPV detection compared to first-void urine from later during the day.

•To study the correlation between HPV detection using self-collected urine samples and physician-taken cervical smears.

Background

•In a hrHPV-oriented screening program, self-sampling can raise the number of women participating. Results of hrHPV-testing in brush-based self-samplers are highly representative when compared to testing on cytology.

•Another, less invasive, method for self-sampling can be found in collecting urine. Exfoliated cells from the cervix and vagina are secreted with the vaginal mucus, contaminating the urine that passes. The detection of HPV DNA in urine for disease surveillance and cervical cancer screening has been widely evaluated over the last years.

•It was found that first-void urine contains higher concentrations of human DNA and HPV DNA than midstream urine. Whether the first fraction of urine of the first-void of the day contains a higher concentration of DNA than the first fraction of any void of the day remains to be determined.

Methods

•Women planned to undergo a colposcopy after an abnormal PAP-smear result (N=84) were sent a device (Colli-Pee™, Novosanis, Wijnegem, Belgium) (Figure 1) to collect first-void urine on the morning of their colposcopy (U1). A second first-void urine sample (U2), a physician-taken cervix smear (PTS) and at least one cervical biopsy were collected during colposcopy.

•DNA from smears was isolated with the NucliSENS easyMAG (250µl input, 100µl eluate) and from the urine samples with the MagNAPure 96 (500µl input, 50µl eluate). DNA from all samples was tested with the analytically sensitive SPF10-DEIA-LiPA25 assay. Biopsies were evaluated by a specialized pathologist.

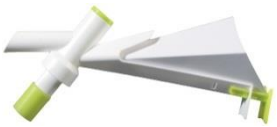

Figure 1: Colli-Pee™, device used to collect first-void urine.

Results

•Comparing U1 and U2, we found identical genotypes in 62 (75.6%), compatible results in 17 (20.7%) and discordant results in 3 (3.7%). In all 3, U2 was HPV-positive and U1 HPV-negative.

•From 65 (79.3%) patients a PTS was available for analyses. Comparing U1 to PTS, in 40 (61.5%) the HPV-results were identical. In 18 (27.8%) compatible results were found and 7 (10.8%) had discordant results. U2 compared to PTS showed the exact same numbers and percentages.

•Morning (U1) and afternoon (U2) urine samples from 82 patients were analysed. The average human DNA concentration in U1 was 17ng/µl and 23ng/µl in U2 (p=0.239).

•Histological diagnosis was available for 63 patients: 33 negative; 15 CIN1; 11 CIN2 and 4 CIN3. hrHPV positivity in CIN2+ and CIN1- lesions was compared for PTS, U1 and U2 (Table 1).

PTS	CIN2+	CIN1-	Total	PPV	34,884
hrHPV positive	15	28	43	NPV	100
hrHPV negative	0	20	20	Sensitivity	100
Total	15	48	63	Specificity	41,667
U1	CIN2+	CIN1-	Total	PPV	34,091
hrHPV positive	15	29	44	NPV	100
hrHPV negative	0	19	19	Sensitivity	100
Total	15	48	63	Specificity	39,583
U2	CIN2+	CIN1-	Total	PPV	34,091
hrHPV positive	15	29	44	NPV	100
hrHPV negative	0	19	19	Sensitivity	100
Total	15	48	63	Specificity	39,583

Table 1: Characteristics of hrHPV-testing in PTS, U1 and U2 for detecting CIN2+ lesions.

Conclusions

•These data suggest that there is no advantage in testing morning first-void urine over first-void from later during the day.

•The detection of CIN2+ lesions through HPV-testing in first-void urine seems feasible, with a sensitivity and specificity similar to the physician-taken smears'.