Clinical validation of the full genotyping clart4s HPV assay on Surepath collected screening samples according to the international guidelines for human papillomavirus test requirements for cervical screening

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CLINICAL VALIDATION OF THE FULL GENOTYPING CLART4S HPV ASSAY ON SUREPATH COLLECTED SCREENING SAMPLES ACCORDING TO THE INTERNATIONAL GUIDELINES FOR HUMAN PAPILLOMAVIRUS TEST REQUIREMENTS FOR CERVICAL SCREENING

11. Genotyping

D.M. Ejegod [1], H. Pedersen [1], K. Cuschieri [2], R. Bhatia [2], C. Lagheden [3], J. Dillner [3], J. Bonde [1]

[1]Molecular Pathology Laboratory, Depart. Pathology, Copenhagen University Hospital, Hvidovre, Denmark - København (Denmark), [2]HPV Research Group, Division of Pathology, University of Edinburgh, Scotland - Edinburgh (United kingdom), [3]Department of Laboratory Medicine, Karolinska Institute, Stockholm, Sweden - Stockholm (Sweden)

Background / Objectives

"additional contribution"

Novel HPV assays intended for cervical screening use must be evaluated in accordance with International guidelines for Human Papilloma Virus test requirements for cervical cancer screening. The CLART HPV4S assay (CLART4S, Genomica, Madrid, Spain) is a PCR based microarray assay targeting the L1 region, and the first full-genotyping assay to detect oncogenic HPV genotypes (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68) and three non-oncogenic-HPV genotypes (6, 11, 66) to achieve fulfillment of international validation criteria using SurePath screening samples. Here we present the outcome of the validation of this novel full-genotyping assay on SurePath collected screening samples, using the GP5+/6+ PCR assay (GP5/6) as a comparator/reference. The genotype concordance between CLART4S and GP5/6 was also assessed.

Results

To assess the performance of the CLART4S assay, SurePath screening samples from women 30 years and above participating in the Danish cervical cancer screening program were collected at Copenhagen University hospital, Hvidovre. For the clinical sensitivity analysis, 81 samples from women with confirmed CIN2 or greater were collected. For the clinical specificity analysis, 1184 samples from

women with less than CIN2 histology were collected. The assay results were compared to that of the GP5/6 assay in collaboration with Karolinska Institutet, Stockholm. The laboratory performance element involved testing 540 individual samples with known GP5/6 results. The inter-laboratory agreement was performed in collaboration with the Scottish HPV Reference Laboratory in Edinburgh, Scotland.

Conclusion

The relative sensitivity of CLART4S was 91.3% (GP5/6=92.6%) and relative specificity was 90.7% (GP5/6=91.0%). The CLART4S assay was shown to be non-inferior to that of GP5/6 for both sensitivity (p=0.00) and specificity (p=0.02). The genotype specific concordance between CLART4S and GP5/6 was good for 12 oncogenic HPV types. The Kappa value for intra-laboratory reproducibility was 0.84 (lower confidence bound 0.92) and for the inter-laboratory agreement the kappa value was 0.72 (lower confidence bound 0.87).

References

This is the first report on the clinical validation study of a full-genotyping HPV assay applied to SurePath collected samples. Using GP5/6 as comparator, the CLART4S performed well and met the International guidelines for sensitivity, specificity, intra-laboratory reproducibility and inter-laboratory agreement. The CLART HPV4S assay is therefore a good candidate for use in cervical cancer screening programs, especially programs utilizing genotype information in the screening algorithms.