Detection and quantitation of human papillomavirus type 16, 18 and 52 DNA in the peripheral blood of cervical cancer patients.

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Abstract

OBJECTIVE: To prospectively evaluate the feasibility of detecting human papillomavirus (HPV) type 16, 18 and 52 DNA in the peripheral blood of patients with cervical cancer using real-time polymerase chain reaction (PCR) and to determine its prognostic importance. METHODS: Blood and cervical swab specimens from 135 consecutive patients with 60 invasive cervical cancers, 10 microinvasions, 20 cervical intraepithelial neoplasias (CIN) III, 10 CIN II, 10 CIN I and 25 controls were collected and examined for HPV type 16, 18 and 52 DNA using real-time PCR to investigate the prevalence and viral load of HPV DNA at the time of diagnosis and during follow-up in patients with positive blood samples. RESULTS: Of the 60 patients with invasive cervical cancer, 27% had positive test results for HPV DNA in blood samples in contrast to 0% of patients with microinvasions, CIN III, CIN II, CIN I and normal controls. The DNA detection rates of viral subtypes in blood samples of cervical cancer patients were 5% for HPV-16, 16.7% for HPV-18, 8.3% for HPV-52, 1.7% for both HPV-16 and HPV-18 and 1.7% for both HPV-18 and HPV-52, while the detection rates in cervical swab specimens were 36.2% for HPV-16, 15.5% for HPV-18 and 17.2% for HPV-52. During follow-up, 8 of 10 cervical cancer patients with viral DNA detected in blood within 3 months after treatment had recurrence, and a high percentage (87.5%, 7/8) of this recurrence involved distant metastases. CONCLUSIONS: In this study, real-time PCR detected HPV-16, -18 or -52 DNA in the peripheral blood of more than one-fourth of invasive cervical cancer patients. The association between risk of cancer recurrence and the amount of viral DNA detected in blood among cervical cancer patients after treatment is intriguing and deserves further investigation.