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Are nail clippings a reservoir for HBV DNA?

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Background: The aim of this study is to evaluate the presence of HBV DNA in the nail clippings of the HBV infected individuals.

Material/methods: This study was carried out in the Sakarya University Research and Training Hospital during the 6-month period between January 2014 and June 2014. The nail clippings of the 22 HBV infected and HBV DNA positive patients were enrolled in the study. Twenty healthy individuals, who were negative HBsAg and HBV DNA, were included as the control group. The nail clipping samples were cut into small pieces with the help of a scalpel. QIAmp[®] DNA Mini Kit (Qiagen, Hamburg, Germany) was used to isolate DNA. Since the nails were keratinised tissue, procedure was modified. The nails were incubated in 1N NaOH at 56°C for 15-20 minutes and then washed two times with distilled water. 80 µl of proteinase K was added and incubated at 56°C for one hour. 300 µl of ATL buffer was also added and the suspension was incubated overnight. The rest of the procedure was carried out according to the instructions of the manufacturer. DNA isolation of the serum samples were accomplished with automated extraction device, QIASymphony^{SP} (Qiagen) by using QIASymphony[®] DSP Virus/Pathogen Midi Kit (Qiagen). HBV-DNA was determined quantitatively by real-time PCR using the artus[®] HBV QS-RGQ kit (Qiagen) on the Rotor-Gene Q 5Plex HRM (Qiagen) real-time thermal cycler. According to the user manual, the analytical detection limit of the kit is 0.02 IU/µl. ROC (receiver operating characteristics) curve analysis was used to determine the cut off value of HBV DNA levels in serum according to positivity of HBV DNA in nail clippings.

Results: HBV DNA was positive in nail clippings of the 11 patients out of 22 in the HBV DNA positive group (Table 1). All the nail clippings of the control group yielded negative result for HBV DNA. According to the statistical calculations, the probability of HBV DNA positivity in nail clippings is 65.3% when the serum HBV DNA level exceeds 1311461 IU/ml. Although statistically not significant, it was remarkable that serum HBV DNA levels were as high as 10^9 - 10^{10} IU/ml in the 6 patients among the positive nail clippings group ($p > 0.005$). It was also interesting that HBV DNA was negative in the nail clippings of a patient with the serum HBV DNA level 10^{10} IU/ml.

Conclusions: In this study, we have evaluated nail clipping samples of 22 patients and remarkably HBV DNA was positive in half of the patients. We have determined that very high HBV DNA serum levels are associated with HBV DNA positivity in nail clippings. Nails should be noted as a reservoir for HBV DNA and as a possible risk factor for transmission of HBV infection.