

Executive Summary: Hepatitis E virus infection in HIV-positive patients (MSS 281 R)

Aim and Objectives

1. To elucidate the molecular prevalence and genotype(s) of hepatitis E virus (HEV) infection in HIV-positive patients in Hong Kong.
2. To determine the seroprevalence of HEV infection in HIV-positive patients in Hong Kong.

Project design

Plasma samples of 1013 HIV-positive patients were collected from two local hospitals in Hong Kong. Viral RNA was extracted and the presence of HEV RNA and the corresponding viral load was measured using real-time quantitative RT-PCR. The HEV genotype was then determined by amplification of the RdRp gene using RT-PCR and PCR, followed by DNA sequencing and phylogenetic analysis. ELISA was used to determine the seroprevalence of HEV by targeting IgG antibodies in the patient plasma samples.

Target population

People living with HIV/AIDS.

Main achievements

HEV RNA was detected in 2.17% (22/1013) of HIV-positive samples. Phylogenetic analysis confirmed that the 22 HEV RNA-positive samples were of either HEV genotypes 3 (18 samples) or 4 (4 samples). The ratio of HEV genotype 3 and genotype 4 were 9:2 among the HEV-infected HIV-positive patients. In addition, the viral loads of these HEV RNA-positive samples was shown to range from 1.94×10^5 to 35.32×10^5 copies/ml.

HEV IgG was detected in 24.67% (250/1013) of HIV-positive samples which was slightly higher than that of the healthy population (20.7%).

Combining the RNA detection and ELISA results, 4 patients (0.39%) were observed to have both HEV RNA and IgG in their plasma samples.

Conclusion

Our study showed that the seroprevalence of HEV IgG was slightly higher in HIV-positive patients than that of the healthy population in Hong Kong. This result is in line with previous studies which identifies higher seroprevalence of HEV IgG in HIV-positive patients compared to the healthy population. However, our study did not identify a sharp difference amongst the two groups. It is suggested that the humoral response of HIV-positive patients to HEV might not be as high as in the healthy population, hence the impeded immune response resulted in only a small difference in their seroprevalence of HEV IgG.

HEV RNA was detected in 2.17% of the HIV-positive patients with genotype 3 HEV being the predominant type circulating among this group of patients. The source and transmission route of this HEV genotype is not clear as HEV is known to be a foodborne transmitted virus in Hong Kong

and the transmitted HEV genotype is typically genotype 4 via consumption of uncooked pork. It will be interesting to further elucidate the source and transmission route of genotype 3 HEV.

This study has improved our understanding of the epidemiology of HEV infection in HIV-positive patients in Hong Kong and raises our awareness of HEV infection in HIV-positive patients and immunocompromised patients. Moreover, it suggests a change of our clinical practice on the management of HIV-positive patients. Untreated chronic HEV infection can lead to severe liver damage and cirrhosis, hence it is important that regular monitoring is performed for HIV-positive patients with HEV infection. By providing prompt treatment, progression of the disease can be prevented.

概要：愛滋病毒（HIV）患者中戊肝病毒（HEV）的感染概況 (MSS 281 R)

目的

1. 闡明香港 HIV 患者中 HEV 的分子流行特徵及基因表型。
2. 判定香港 HIV 患者中 HEV 的血清流行特徵。

課題設計

收集香港兩家醫院 1013 份 HIV 陽性血漿，提取病毒 RNA，RT-PCR 檢測 HEV RNA 的存在情況及相應的病毒載量。RT-PCR 結合 PCR 擴增 HEV 陽性樣品中 HEV RdRp 基因片段，並做測序和系統進化樹分析。同時 ELISA 檢測 HIV 陽性血漿中 HEV IgG 的流行情況。

目標人群

HIV/AIDS 患者

主要成果

2.17% (22/1013) 檢測到 HEV RNA。系統進化樹分析證實 18 例為 HEV-3, 4 例為 HEV-4，HEV-3 和 HEV-4 的比率為 9：2。病毒載量為每毫升 1.94×10^5 到 35.32×10^5 個。

24.67% (250/1013) 檢測到 HEV IgG，稍高於健康人群（20.7%）。

結合 RNA 和 ELISA 檢測結果，4（0.39%）個 HIV 患者中同時有 HEV RNA 和 IgG。

結論

香港 HIV 患者中 HEV IgG 流行率稍高於健康人群，這與之前發現的 HIV 患者中 HEV IgG 流行率高於健康人群一致，但該研究未表明 HEV IgG 在這兩個群體中有很大的差別。這說明在 HIV 感染者中針對 HEV 的體液免疫應答低於正常人群，這種阻礙造成了兩個群體間 HEV IgG 的流行僅有小差別。

2.17% 樣品中檢測到 HEV RNA，主要為 HEV-3，但 HEV-3 的來源及傳播途徑並不清楚。HEV 為食源性傳播，香港流行的 HEV-4 被證實由食用未熟的豬肉獲得，因此進一步闡明 HEV-3 的來源和傳播途徑很有意義。

研究提升了對 HEV 在香港 HIV 及免疫缺陷病人中的流行病學的瞭解和認識，並建議在針對 HIV 患者的臨床干預上做一定改變。未經治療的慢性 HEV 感染可引發嚴重的肝損傷和肝癌，因此定期的監測 HIV/HEV 共感染患者的肝臟健康狀態有利於提供及時治療預防疾病進展。