

Genotypes of Hepatitis C Virus in United Arab Emirates: Their Relationship with Age, Gender, Nationality, and the Severity of Liver Disease with Viral Load

Seham Abdelwahed Hafez Koura, Egypt.

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Background:

Hepatitis C virus (HCV) is a major global public health problem with estimate of 3% chronicity. The prevalence of HCV in Eastern Mediterranean Region was variable with a range of 1% to 14.9%. HCV infection was found to be endemic in Arab World as different studies confirmed such endemicity. Arabian Peninsula region HCV prevalence was reported as low (1-1.9) in Oman, Saudi Arabia, Kuwait, and Bahrain, while it was moderate in Yemen (2.0-2.9), high in UAE (3.0-3.9), and very high in Qatar (>4).

Aim of the study:

To study the sero-molecular epidemiology of HCV in UAE genotypes among the patients who have HCV positive antibodies and differentiate them according to their nationality in United Arab Emirates.

Specific objectives: To:

1. Determine HCV genotypes among patients who have HCV positive antibodies in UAE.
2. Differentiate HCV genotypes according to their nationality, age and gender in UAE.
3. Study the impact of HCV genotype and viral load on the hepatic pathology.
4. Illustrate whether expatriate Egyptian are responsible for HCV prevalence increase in UAE.

Patients and Methods:-

The study was conducted from June 2013 to December 2017 at the Medical as well as Infectious Diseases clinics at Khalifa Hospital Abu Dhabi, UAE. The patients with positive screening test for HCV antibodies referred from other clinics and peripheral health centers were included in the study. The study was designed to include patient's demographics (age, sex, nationality, etc.), clinical information

including the various risk factors (I.V. drug abuse, sexual contacts, blood transfusion, operative procedures and tattoo marks) for the transmission of HCV and laboratory data which included serum HCV RNA levels, HCV Genotypes and Liver function test (LFTs). The patients were included into the study after informed consent. A blood sample of each patient was collected and the confirmation of HCV was done by Western blot (HCV Blot 3.0 by MP Diagnostics). The confirmed cases were further tested for HCV RNA levels by polymerase chain reaction (Amplicor HCV Kit, Roche Diagnostic System) and subsequently HCV-RNA positive patients were genotyped by selective hybridization of amplicons to HCV genotype-specific oligonucleotides (Inno-Lipa2, Innogenetics). Liver function test (LFTs) was done by Hitachi Machine 912.

Results:

A total of 193 patients included in the study with a mean age of 44.23 years and 76.68% of them were male, with M/F ratio of 3/1. The highest frequency was in Egyptian [60.10%], followed by UAE [18.13%] and 21.76% in others. The predominant genotype was 4 [67.93%], type 1 form 16.85%, and type 3 form 15.22%. Unfortunately, two third of cases were with severe HCV infection as demonstrated by high viral load in 71.74% of cases, with a mean viral load of 6220679.04 in 138 cases. Fibro score of 4 form 29.01% of cases and 45.06% of cases were with high severity according to fibro score, however, the liver cirrhosis was found in 1.04% of cases. In addition, high severity in both viral load and fibro disease was found in 34.11% of cases, and severe in either of them in 49.1% of cases. The relapse rate was low [2.59%] in this study cohort. Gender with significant influence on HCV genotype [$P=0.001$]. HCV type 1 was higher in female [40.48%] than in male [9.86%], while type 3 was higher in male [17.61%] than in female [7.14%], also type 4 was more frequent in male [72.54%] than in female [52.28%]. HCV genotype 4 was the predominant types in Egyptian [97.35%], while type 1 in UAE citizen [68.57%], and type 3 in others [63.89%]. Age was not with significant influence on genotype frequency, however, gender, nationality, and disease severity was with significant association between HCV genotype and age, gender and nationality [$X^2 = 179.01$; $P=0.001$]. Female gender was with negative association with type 3 genotype and female with relative risk to infection with type 4 genotype 11 times to infection with type 3 genotype. There is no observed Egyptian with type 3 genotype infection in our study cohort. Viral load severity tends to achieve high fibro score levels after excluding the effect of gender and age. The nationality does not have a significant effect on fibro score after excluding the effect of gender, age and viral load severity. However, age have a significant positive effect on fibro score after excluding the effect of gender and viral load severity. Female category has a negative significant effect on the fibro score after excluding the effect of viral load severity and age.

Conclusion:

HCV more predominant in Egyptian than in UAE. However, Egyptian has a significant negative correlation [OR=0.085, P=0.006] with type 1, while UAE are with significant positive correlation with genotype 1 after excluding the effect of gender. Furthermore, Egyptian is 11 times susceptible for genotype 4 than for genotype 1, while the Emirati are 10 times susceptible for genotype 1 than for genotype 4. However, the genotype frequency distribution indicated that HCV infection in Emirati was with significant association with type 1 [OR=10.246; p=0.003], while OR was 0.085 in Egyptian and thus the hypothesis that presumed the increase in prevalence of HCV in Emirati was excluded. In addition, type 3 genotype was with 0% frequency in Egyptian, while it forms 63.89% as a cause of HCV infection in other nationality and thus this finding is strong evidence that exclude Egyptian a cause for increase of hepatitis C in Emirati.

Key words: Hepatitis, HCV- Genotype, Viral load, hepatic pathology.