Hepatitis B and C virus prevalence in couples attending an in vitro fertilization clinic in a tertiary care hospital in Saudi Arabia: comparison with ten years earlier

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BACKGROUND: Viral hepatitis B (HBV) and C (HCV) are a major public health problem in Saudi Arabia. Recent data has indicated a major reduction in viral hepatitis prevalence in Saudi population. However, there is limited data for infertile Saudi couples.

OBJECTIVES: To determine the prevalence of HCV and HBV attending an in vitro fertilization (IVF) clinic in Saudi Arabia between 2012 and 2015 to compare with the prevalence 10 years earlier in the same center.

DESIGN: Retrospective prevalence study.

SETTING: Tertiary care center in Riyadh.

PATIENTS AND METHODS: Data on the prevalence of HBV and HCV was collected on all couples seen at the IVF unit between 2002 - 2005 and 2012 - 2015.

MAIN OUTCOME MEASURE(S): Prevalence of HBV and HCV.

RESULTS: In 4442 patients during 2002-2005 and 5747 patients during 2012-2015, the prevalence of HBV was significantly less in 2012-2015 compared with 2002-2005 (1.67% [97 patients] vs 4.7% [210 patients], P<.0001), respectively, but HCV prevalence was similar for the two periods (0.7% for both periods) (P=.887).

The hepatitis B seroprevalence rate was higher in males compared to females during 2002-2005 (6.3% vs 3.1%) (P<.0001) and 2012-2015 (2.4% vs 1.1%) (P<.0001), respectively.

CONCLUSION: The significant drop in HBV prevalence was most likely due to the introduction of the vaccination program in 1989, while reasons for HCV prevalence remaining unchanged are unclear.

LIMITATION: No data on confounding factors that may have affected the prevalence.
HCV AND HBV IN IVF

In this retrospective study, data was collected on HBV and HCV prevalence for all couples seen at the IVF unit, King Faisal Hospital and Research Centre in Riyadh, between 2002-2005 and 2012-2015. The study was approved by KFSHRC Institutional Review Board. If the hepatitis B surface antigen (HBsAg) or hepatitis B core antibody (HBCAb) were positive, the patient was considered hepatitis B seropositive. For HCV, couples were tested for HCV antibodies or by recombinant immunoblot assay (RIBA). The chi-square test was used to test for statistically significant differences and for trends. A P value <.05 was considered statistically significant.

RESULT

For 4442 patients during 2002-2005 and 5747 patients during 2012-2015, there were significantly more HBV positive patients in the period from 2002-2005 (210 positive, 4.7%) compared to 2012-2015 (97 positive, 1.6%) (Table 1). However, the seropositivity rate for HCV was not different between the two study periods (P=.887). HBV seropositivity was significantly higher in males compared to females in for both periods (6.3% vs 3.1% and 2.4% vs 1.1%, respectively, P<.0001) (Table 2). Seropositivity for HCV between the two genders was not significantly different (Table 2).

DISCUSSION

The present study shows that the prevalence of HBV during 2012-2015 (1.67%) was low as defined by the WHO. This seroprevalence was similar to other studies conducted about the same period in Saudi Arabia.

PATIENTS AND METHODS

In this retrospective study, data was collected on HBV and HCV prevalence in the IVF population in Saudi Arabia between 2002 and 2008 as reported by Mansoor et al. The overall prevalence of HBV was 1.3% in premarital screening program between years 2012-2015 and compare it with the prevalence 10 years earlier in the same population.

Prevalence of hepatitis B and C virus in the study population.

| Year          | HCV 2002-2005 (n, %) | HCV 2012-2015 (n, %) | P value |
|---------------|----------------------|----------------------|---------|
| HCV           | 32 (0.7)             | 40 (0.7)             | .887    |
| HBV           | 210 (4.7)            | 97 (1.68)            | .0001   |

HBV=hepatitis B virus, HCV=hepatitis C virus.

Prevalence of hepatitis B and C virus in study population by sex.

| Year          | Male n (%) | Female n (%) | P value |
|---------------|------------|--------------|---------|
| 2002-2005     |            |              |         |
| HBV           | 141 (6.3)  | 69 (3.1)     | <.0001  |
| HCV           | 19 (0.8)   | 13 (0.59)    | .287    |
| 2012-2015     |            |              |         |
| HBV           | 61 (2.5)   | 36 (1.1)     | <.0001  |
| HCV           | 17 (0.68)  | 23 (0.7)     | .92     |

HBV=hepatitis B virus, HCV=hepatitis C virus.
health care facilities, especially after introduction of blood screening program in Saudi Arabia in the early 1990s, helped reduce the prevalence of HCV at that period. That period was not included in our study. Afterwards, HCV prevalence remained constant in Saudi Arabia. Unlike HBV prevalence, which declined mainly due to the availability of HBV vaccine, implementation of HCV vaccination is under development. A national screening program, increased public awareness of HCV transmission, and a new generation drugs to treat HCV infection, may help to reduce the prevalence in future.

There was an obvious difference in HBV prevalence between males and females in Saudi Arabia. In our study, the incidence of HBV seropositivity showed a higher prevalence of HBV infection in males vs. females during both time periods. This difference has been observed in several studies. There is no clear explanation for the gender variation. The difference is probably related to the conservative society with less female exposure outside the family, but may also be due to opposite effects of sex hormones. In several experimental animal models, viral transcription is stimulated by androgen, while estrogen suppresses HBV transcription. In HCV seroprevalence there were no male vs female differences (0.8% vs 0.5%, and 0.7% vs 0.6%) between 2002-2005 and 2012-2015.

Our data suggest that viral hepatitis remains a major health problem in Saudi Arabia and that continued observation and monitoring are important to evaluate disease prevalence and the impact of new health program interventions. In assisted reproductive centres offering care for patients who are carriers of HBV and HCV, there is a need for more comprehensive preventive strategies and prevention of cross contamination. The issue of being a carrier is important for embryo freezing. Once infection is confirmed some centres do not freeze while others use separate cryocontainers to avoid cross contamination. Our data is the first in the country in the reproductive population showing the patterns of HBV and HCV and comparing the prevalence between two periods of time. The data show a significant decline in HBV prevalence among reproductive age patients, which was most likely due to vaccination, while HCV prevalence was unchanged from 10 years earlier. A limitation of the study was that no data was collected on confounding factors that may have affected the prevalence.

**Conflict of interest**

The authors declare no conflicts of interest.
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