

PATTERNS OF VIRAL INFECTION REPORTED AT AL-MADEAN GENERAL
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ABSTRACT

Background: The human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) continue to be significant global public health challenges. These infections are responsible for a major amount of infection-related morbidity and mortality globally, due to their chronic nature, delayed clinical manifestation, and severe long-term consequences. **Objectives:** To assess the outcomes of routine viral assessment for HIV, HBV, and HCV among patients at Al-Madaen General Hospital during a 16-month period. **Methods:** The study was a descriptive, hospital based, cross-sectional study carried out during the period from 2nd of January 2024 till the 30th of July 2025 at Al-Madaen General hospital. The study population consisted of individuals who referred for viral screening as part of premarital screening, preoperative assessment, and prenatal care. **Results:** During the study period, a total of 28066 people had routine viral screenings at Al-Madaen General Hospital. 6162 (21.9%) were screened as part of premarital testing, and 21904 (78.1%) were screened during preoperative evaluation or antenatal care. Among premarital screening, Hepatitis C virus was the commonest viral infection in 21 (0.34%) patients followed by hepatitis B in 20 (0.32%) patients and Human immunodeficiency virus in 5 (0.08%) patients. While during preoperative and antenatal care, Hepatitis B virus was the commonest viral infection in 11 (0.05%) patients followed by both of hepatitis C and Human immunodeficiency virus in 2 (0.009%) patients. Premarital group showed a statistically significant difference higher prevalence regarding all of the HIV, HBV and HCV. **Conclusion:** Routine viral screening at Al-Madaen General Hospital found a low overall prevalence of HIV, HBV, and HCV, with premarital screening participants demonstrating significantly higher detection rates.

KEYWORDS: Mariage, Preoperative, Screening, Virus.

1. INTRODUCTION

The human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) continue to be significant global public health challenges. These infections are responsible for a major amount of infection-related morbidity and mortality globally, due to their chronic nature, delayed clinical manifestation, and severe long-term consequences.^[1] Chronic HBV and HCV infections are substantial risk factors for liver cirrhosis and hepatocellular carcinoma, whereas HIV infection causes progressive immunodeficiency, increasing vulnerability to opportunistic infections and cancers. Collectively, these viral infections place a

significant strain on healthcare systems, especially in countries with low to middle incomes.^[2-3]

According to the World Health Organization, viral hepatitis alone causes 1.3 million fatalities each year, the majority of which are due to complications of chronic liver disease.^[4] Despite global advances in antiviral therapies and preventive methods, underdiagnosis remains a major impediment to successful disease control. Many infected people go a long time without symptoms and may accidentally spread the infection to others. As a result, early detection through organized screening programs is acknowledged as a critical component of prevention, prompt intervention, and

transmission reduction at the community and healthcare levels.^[5-6]

Routine viral screening is now commonly employed in a variety of clinical and public health contexts, including premarital counseling, preoperative examinations, and prenatal care services.^[7] Premarital screening is critical for lowering horizontal transmission between couples and preventing vertical transfer to offspring, as well as promoting informed reproductive and marital decision-making.^[8] Preoperative viral screening improves patient safety and reduces occupational exposure hazards for healthcare professionals by enabling adequate infection control measures.^[9] Antenatal screening is particularly important for detecting infected pregnant women and adopting therapies that greatly reduce HIV and viral hepatitis transmission from mother to child.^[10]

In Iraq, viral hepatitis and HIV continue to be important public health concerns, influenced by factors such as population movement, healthcare access variability, historical blood transfusion practices, and limited awareness in certain communities.^[11] National screening programs have been implemented in selected settings; however, surveillance data is frequently fragmented, and regional-level analyses are relatively limited. Understanding the distribution of HIV, HBV, and HCV across different screening categories in hospital settings is critical for optimizing preventative programs, allocating resources effectively, and strengthening infection control policies.^[12] As a result, the aim of this study was to assess the outcomes of routine viral assessment for HIV, HBV, and HCV among patients at Al-Madean General Hospital during a 16-month period.

2. Patients and Methods

The study followed medical research ethics requirements. Patient identities were eliminated and data was only analyzed in aggregate. The study was a descriptive, hospital based, cross-sectional study carried out during the period from 2nd of January 2024 till the 30th of July 2025 at Al-Madaen General hospital. The study population consisted of individuals who referred for viral screening as part of premarital screening, preoperative assessment, and prenatal care.

All individuals were tested for the following viral infections; HIV, HBV, and HCV. Screening was done using standard serological assays in accordance with hospital laboratory guidelines. Demographic and screening category information was gathered from hospital laboratory records. The total number of people tested and their distribution among screening groups were recorded.

The data was analyzed using descriptive statistics. The findings were presented as frequencies and percentages. The distribution of screened persons by indication (premarital, preoperative, prenatal) was calculated. Chi square test was used to evaluate P value among

categorical variables. A value of less than 0.05 was considered statistically significant.

3. RESULTS

During the study period, a total of 28066 people had routine viral screenings at Al-Madean General Hospital. 6162 (21.9%) were screened as part of premarital testing, and 21904 (78.1%) were screened during preoperative evaluation or antenatal care.

Table 1 shows viral infection prevalence among premarital screening group. Hepatitis C virus was the commonest viral infection in 21 (0.34%) patients followed by hepatitis B in 20 (0.32%) patients and Human immunodeficiency virus in 5 (0.08%) patients.

Table 1: Viral infection prevalence among premarital screening group (Number = 6162).

| Virus | Gender | Number | Prevalence |
|-------|--------------|-----------|--------------|
| HIV | Male | 5 | 0.08% |
| HIV | Female | 0 | 0% |
| HIV | Total | 5 | 0.08% |
| HBV | Male | 15 | 0.24% |
| HBV | Female | 5 | 0.08% |
| HBV | Total | 20 | 0.32% |
| HCV | Male | 19 | 0.31% |
| HCV | Female | 2 | 0.03% |
| HCV | Total | 21 | 0.34% |

Table 2 shows viral infection prevalence among preoperative and antenatal screening group. Hepatitis B virus was the commonest viral infection in 11 (0.05%) patients followed by both of hepatitis C and Human immunodeficiency virus in 2 (0.009%) patients.

Table 2: Viral infection prevalence among preoperative and antenatal screening group (Number = 21904).

| Virus | Gender | Number | Prevalence |
|-------|--------------|-----------|---------------|
| HIV | Male | 2 | 0.009% |
| HIV | Female | 0 | 0% |
| HIV | Total | 5 | 0.009% |
| HBV | Male | 8 | 0.04% |
| HBV | Female | 3 | 0.01% |
| HBV | Total | 11 | 0.05% |
| HCV | Male | 0 | 0.00% |
| HCV | Female | 2 | 0.009% |
| HCV | Total | 21 | 0.009% |

Table 3 shows comparison between viral prevalence between premarital and preoperative/antenatal screening groups. Premarital group showed a statistically significant difference higher prevalence regarding all of the HIV, HBV and HCV.

Table 3: Comparison of viral prevalence between premarital and preoperative/antenatal screening groups (Number = 28066).

| Virus | Premarital, number = 6162 (%) | Preoperative/Antenatal = 21904 (%) | P value |
|-------|----------------------------------|---------------------------------------|---------|
| HIV | 0.08% | 0.009% | <0.001 |
| HBV | 0.32% | 0.05% | <0.001 |
| HCV | 0.34% | 0.009% | <0.001 |

4. DISCUSSION

Although the overall prevalence of viral infections was low, there were statistically significant differences between screening categories, with premarital screening detecting more cases than preoperative and prenatal screenings. Despite the large sample size, the preoperative and prenatal screening group had a considerably lower rate of viral infections, which could be attributed to variations in healthcare availability and previous screening. Patients having surgery or prenatal care are more likely to have had previous medical interaction, HBV immunization, or diagnostic testing. These data demonstrate the epidemiological importance of mandated preconception screening in detecting asymptomatic carriers in the community. Several Iraqi and regional studies have found individuals having premarital screening have a higher prevalence of HIV, HBV, and HCV. Al-Hilali et al did premarital screening research in central Iraq and found comparable low HIV prevalence as well as higher rates of HBV and HCV, particularly among males.^[13] Similarly, a major population study in the Kurdistan Region comprising over 15,000 premarital candidates found HBV prevalence nearing 1% and HCV prevalence around 0.1%, with a significant male predominance.^[14] These studies lend credence to the idea that premarital screening identifies a younger, sexually active, and mainly asymptomatic population that may have undetected exposure concerns before marriage.

Male preponderance among viral infections in the current study is consistent with findings from several Middle Eastern screening programs. Studies from Iraq, Saudi Arabia, and neighboring countries consistently show that males have higher HBV and HCV seropositivity, which has been attributed to greater occupational exposure, a higher likelihood of invasive procedures, and increased participation in high-risk behaviors.^[15-16]

The detection of HBV in both males and females across all screening categories demonstrates the region's hepatitis B endemicity, despite the availability of successful immunization programs. This finding is consistent with national surveillance data and earlier Iraqi study findings that have highlighted gaps in vaccination coverage among people born before universal childhood immunization.^[17] Similarly, although HCV prevalence was low, its existence in premarital and prenatal groups emphasizes the significance of ongoing routine screening, as recommended by the World Health Organization, in meeting viral hepatitis elimination targets.^[18-19]

Overall, this study's findings are consistent with regional and international data, suggesting that routine hospital-based screening programs remain critical tools for early diagnosis of blood-borne viral infections, particularly in low-prevalence settings. The findings support the public health utility of premarital screening as a preventative strategy, while also underlining the ongoing need for preoperative and prenatal screening to guarantee patient safety and minimize vertical and occupational transmission.

The study has many limitations. The hospital-based design may limit its applicability to the larger population. The lack of precise demographic and behavioral risk data restricted evaluation of transmission determinants. Furthermore, confirmatory tests and viral load measures were left out, and the preoperative and prenatal groups were evaluated combined, potentially masking subgroup differences.

5. CONCLUSIONS AND RECOMMENDATIONS

Routine viral screening at Al-Madean General Hospital found a low overall prevalence of HIV, HBV, and HCV, with premarital screening participants demonstrating significantly higher detection rates. Male preponderance was found across overall viral infections. Premarital screening remains an important public health measure for detecting asymptomatic carriers and preventing transmission.

Conflict of interest

The authors of this study report no conflicts of interest.

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