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RESEARCH ARTICLE

AN ARTICLE REVIEW ON PREVALENCE OF HEPATITIS C VIRUS INFECTION IN SAUDI ARABIA 2022

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ABSTRACT

Kingdom of Saudi Arabia initiative, that was implemented on the 15th of November 2020, aimed to improve the surveillance of HCV infection among all population. The objective was to eliminate HCV infection, and by that fulfilling the 2030 vision of Saudi Arabia. Official national circulars, that were signed by higher authorities, concentrated on early detection through passive surveillance of cases reported from laboratories, or through active surveillance in the community or in high-risk groups. The data shows that over the years, the prevalence rates of hepatitis C in Saudi Arabia have decreased. However, there is a need to underscore the low quality of data available. Most of the data is fragmented into various population cohorts. Utilization of current data available in the national initiative is mandatory to assess the current situation and to recalculate the prevalence which would be of value for planning, budget allocation, and to assess the need for further active surveillance.

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INTRODUCTION

Hepatitis C virus infections are a health burden at a global level. The infections are implicated in an increasing prevalence of morbidity and mortalities related to liver disease (Axley *et al*., 2018; Haqqi *et al*., 2019; Modi & Liang, 2008; Petruzziello *et al*., 2016; Roudot-Thoraval, 2021; Sy & Jamal, 2006; Tang, 1991). Global epidemiology research shows that despite the importance of the disease, the number of countries tracking the prevalence rates is worryingly low (Gower *et al*., 2014). The diagnosis of hepatitis C is critical for effective treatment response to reduce morbidity and mortality rates (Akbar *et al*., 2009; Castro *et al*., 2015; Colpitts *et al*., 2020; Dahiya *et al*., 2019; Karoney & Siika, 2013; Millman *et al*., 2017; Squires & Balistreri, 2020). The prevalence of the viral infection varies significantly across the globe, with statistics showing higher prevalence in the eastern countries of the globe compared to their western counterparts (Harfouche *et al*., 2017; Mahmud *et al*., 2020; Memon & Memon, 2002; Mohamoud *et al*., 2014; Mumtaz *et al*., 2015). Tracking the infections is necessary to understand disease trends and to determine whether the trajectory tends towards zero or whether there is a growth in prevalence (Basyte-Bacevice & Kupcinskas, 2020; Shen *et al*., 2015). Tracking the prevalence rate is also necessary to highlight the groups that require preventative measures (Bosan *et al*., 2010; Labhade *et al*., 2020; Nawaz *et al*., 2015; Rashiti-Bytyçi *et al*., 2021; Wong & Lee, 2006). It is in this spirit, that this paper evaluates the prevalence of the infection in Saudi Arabia.

Prevalence of Hepatitis C in Saudi Arabia: Kingdom of Saudi Arabia initiative, that was implemented on the 15th of November 2020,aimed to improve the surveillance of HCV infection among all population. The objective was to eliminate HCV infection, and by that fulfilling the 2030 vision of Saudi Arabia. Official national circulars, that were signed by higher authorities, concentrated on early detection through passive surveillance of cases reported from laboratories, or through active surveillance in the community or in high-risk groups. The Ministry of health of Saudi Arabia included in its surveillance the screening of all patients admitted in hospitals, all patients visiting outpatient clinics, blood donors, premarital medical checkup, medical screening for employment in all sectors, psychiatric hospitals admissions, new prisoners' medical checkup, and old prisoners annual medical checkup. It provided a range of special clinics to accept all patients and facilitated access to diagnosis, treatment, and follow up according to the latest international guidelines. All data was monitored through indicators utilizing the electronic systems available as part of the national data base of the country. Although Saudi Arabia is one of the countries in the Middle East tracking the prevalence and other data on hepatitis C, there is still limited data on the prevalence rate of infections to facilitate a comprehensive description of the infection status in the country (Madani, 2007). One of the comprehensive assessments of the infection's prevalence in Saudi Arabia was performed by Madani (2007), with the collected data spanning over 11 years from 1995 to 2005. Table shows that hepatitis C was most prevalent in the regions of Jeddah, East, Makkah, and Riyadh.

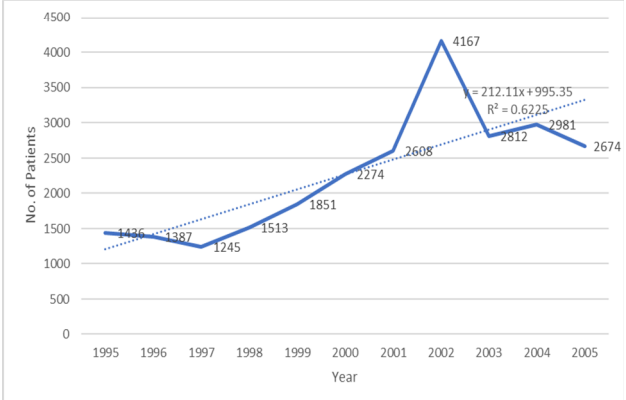
These were also the regions with populations exceeding a million people. Interestingly, Riyadh, which had over twice the population of Jeddah, had half the number of reported hepatitis C infections (Madani, 2007). Statistics also show that there was a steady increase in the incidence rate of hepatitis C infections.

Figure shows the incidence rate of infections reduced between 1995 and 1997. However, there was a sustained increase in new infections between 1997 and 2002. There was a sharp decline in the incidence of infections between 2002 and 2005. However, the trend line shows that there has been a sustained increase in incidence between 1995 and 2005. Considering the fact that prevalence rates reflect both the incidence rate of a disease and its duration (Centers for Disease Control and Prevention, 2012), high incidence rates are an indicator of high prevalence, especially in populations where there is low access to treatment. While being comprehensive, the tracking of the infection's prevalence in Saudi Arabia by Madani (2007) is not up to date. Recent data on the infection's prevalence is contained in fragmented reports from studies exploring specific populations or areas in research. This problem characterizes the argument for limited reliable data on the prevalence of hepatitis C in Saudi Arabia. Al Humayed *et al*. (2018)explored links between hepatitis C and type 2 diabetes mellitus in Southwestern Saudi Arabia's Abha City. The researchers found a hepatitis C seroprevalence rate of 5%. However, there was a higher seroprevalence rate among patients with type 2 diabetes mellitus (8.0%) compared to the non-diabetic patients (2%) (Al Humayed *et al*., 2018).

Table 1. People with hepatitis C virus antibodies per 100,000 population in different regions of Saudi Arabia between 1995 and 2005

Region	Reported cases	Mean population at the time
Baha	1268	393 327
Jeddah	9186	2 866 113
Najran	734	356 250
East	3522	1 824 952
Qunfoda	102	55 725
Makkah	2022	1 483 258
Riyadh	4159	4 538 346
Qassim	812	890 625
Bisha	218	288 321
Tabook	389	575 000
Madina	808	1 283 251
Jouf	112	205 882
Asir	568	1 297 311
Ahsa	351	940 217
Qerayyat	33	113 393
Hail	143	487 778
North Borders	78	270 808
Tayef	221	883 186
Hafr Albaten	62	280 727
Jizan	160	1 030 159
Total	24 948	20 064 629

Source: (Madani, 2007).



Source: (Madani, 2007).

Figure 1. Trends in hepatitis C infection per year in Saudi Arabia between 1995 and 2005

Research has shown a high prevalence of hepatitis C among patients undergoing hemodialysis in Saudi Arabia. Statistics derived from reports where the first-generation (enzyme-linked immunosorbent assay) ELISA showed prevalence ranging from 30% to 54% (Huraib *et al*., 1995). These levels have negative implications for dialysis patients. The use of second-generation enzyme immunoassay in 22 hemodialysis centers in Saudi Arabia yielded a prevalence rate of 68%, the rates ranging from 14.5% to 94.7% (Huraib *et al*., 1995). A study in Jeddah between January 1998 and December 1998 yielded a prevalence rate of 5.87% (Fakeeh & Zaki, 1999). Another study performed at King Khalid General Hospital in 1994 using ELISA showed a prevalence of 4.3% among blood donors, 2.2% among medical staff, and 6.9% among patients undergoing dialysis (Mahaba *et al*., 1999). In their study of patients undergoing dialysis, Almawi *et al*. (2004) found that the prevalence of hepatitis C was 9.24%. In addition to patients undergoing hemodialysis, the study by Shobokshi *et al*. (2003) also included pregnant women, drug addicts, children, and blood donors. The researchers also tested for the viral infection via third-generation enzyme immunoassay kits. They found an overall prevalence rate of 1.1% among blood donors, 0.7% among pregnant women, and 0.1% among children (Shobokshi *et al*., 2003). A study of serological markers for hepatitis C virus, among others, between 200 and 2002 yielded a prevalence rate of 0.4% (El-Hazmi, 2004).

The evolution of the techniques used for diagnosing hepatitis C has offered new opportunities to estimate prevalence more accurately. Al Humayed *et al*. (2017) employed the fourth-generation ELISA in the Aseer region of Saudi Arabia, a region known for the country's highest endemicity of the infection. The researchers also performed a Reverse transcription-polymerase chain reaction (RT-PCR) as a qualitative confirmatory test. The study yielded a seroprevalence of 2.2% (Al Humayed *et al*., 2017). A study on patients attending in vitro fertilization clinics from 2002 to 2005 and 2012 to 2015 showed that there was a higher prevalence between 2002 and 2005 at 4.7% compared to 2012 and 2015, where the prevalence rate among this population cohort was estimated at 1.67% (Albadran *et al*., 2017). A study focusing on healthcare workers and health college students in Saudi Arabia's Najran region showed a 0% seroprevalence among healthcare students and 0.3% among healthcare workers (J. M. Alqahtani *et al*., 2014).

A study in King Abdulaziz Medical City between 2000 and 2007showed an annual incidence rate of 13.6 patients per 100,000 patients (Memish *et al*., 2010). Other studies have focused on specific population cohorts (Khalsa & Mathur, 2021), such as Njoh & Zimmo (1997) reported a 74.6% prevalence rate among intravenous drug users living in Jeddah city, 0.242% among premarital adults in Al Majmaah (Mir & Alshehri, 2021), 0.32% among blood donors in Riyadh (S. M. Alqahtani *et al*., 2021), and 5.3% among healthy Saudis (Bahakim *et al*., 1991). Another study reported that the hepatitis C surface antigens were prevalent among 77.8% of intravenous heroin users in central Saudi Arabia (Alshomrani, 2015). High levels have also been reported in users of other classes of drugs (Alzahrani, 2005). Other studies have explored the different genotypes of hepatitis C (Karkar, 2007; Khan *et al*., 2017). Bawazir *et al*. (2017) reported that the most prevalent genotype was HCV genotype 4 at 60.7%. Genotype 1 followed a distant second at 24.8%. Genotype 2 had a prevalence of 4.8% in males and 2% in females, while genotype 4 had a prevalence of 68.5% in males and 52.3% in females (Bawazir *et al*., 2017).

CONCLUSION

The data shows that over the years, the prevalence rates of hepatitis C in Saudi Arabia have decreased. However, there is a need to underscore the low quality of data available. Most of the data is fragmented into various population cohorts. Utilization of current data available in the national initiative is mandatory to assess the current situation and to recalculate the prevalence which would be of value for planning, budg*et al*location, and to assess the need for further active surveillance.

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