World Journal of Pharmaceutical research

Volume 1, Issue 4, 1212-1222. Research Article ISSN 2277 – 7105

PREVALENCE OF VIRAL HEPATITIS AMONG POPULATION OF AL-QUWAYIYAH GOVERNORATE, SAUDI ARABIA

Al-Ghonaim, Mohammed I.; Abdel-Ghaffar, Mamdouh H.*; Alnomasy, Sultan F.; Thalji, Mohamed R. and Khan, Farhan R.

Medical Laboratory Science Department, College of Applied Medical Sciences at Al-Quwayiyah, Shaqra University, Kingdom of Saudi Arabia.

Article Received on
20 August 2012,

Revised on 27 August 2012,
Accepted on 01 September 2012

***Correspondence for Author:**

*** Dr. Abdel-Ghaffar, Mamdouh H.**

Medical Laboratory Science Department, College of Applied Medical Sciences at Al-Quwayiyah, Shaqra University, Kingdom of Saudi Arabia

mabdelghaffar@su.edu.sa,

ABSTRACT

This study showed the prevalence rate of viral hepatitis at Al-Quwayiyah Governorate by collecting data from blood samples taken during the year of 2012 (1432 Hijri) at Al-Quwayiyah general hospital. The study categorized the data into male/female and Saudi/non-Saudi patients. Among 2400 tested samples, 2.12% of potential patients were hepatitis B virus (HBV) positive, where 84.3% belong to Saudi patients and 80.4% belong to male patients. Hepatitis C virus (HCV) showed a slightly higher prevalence of 2.37%, where 59.6% belong to Saudi patients and 73.7% belong to male patients. Hepatitis A virus was not tested in the hospital. Such data revealed the dramatic decline in prevalence rates for viral hepatitis over the past two to three decades due to the significant improvement in the levels of personal and public hygiene and in the proportions of the Saudi population.

Keywords: Al-Quwayiyah Governorate, HBV, HCV, Prevalence rate.

INTRODUCTION

Viral hepatitis is a general name for several forms of liver inflammation that are caused by a virus. Viral hepatitis is the most common type of hepatitis, a group of serious diseases that cause inflammation of the liver and liver damage. Viral hepatitis is often called infectious hepatitis, and the viruses that cause it are contagious and can be passed from person to person [(1)].

Viral hepatitis includes hepatitis A, hepatitis B, hepatitis C, hepatitis D, and hepatitis E. Each of these types of viral hepatitis is caused by the hepatitis virus of the same name, such as the hepatitis A virus. The most common forms of viral hepatitis are hepatitis A, hepatitis B, and hepatitis C [(2)].

All types of viral hepatitis cause inflammation of the liver. The liver is a vital organ, and normal functioning of the liver is crucial to health and life. Viral hepatitis can reduce the liver's ability to do its vital function in helping the body to resist infection, stop bleeding, clear the blood of toxins, store energy, digest food and remove waste[(3)].

Symptoms of viral hepatitis differ between individuals depending on such variables as the specific type of viral hepatitis, age, medical history, the presence of complications and general health. Symptoms common to viral hepatitis include flu-like symptoms, fever, headache, nausea, muscle aches and jaundice. Complications can be serious, even life-threatening, and include the development of chronic hepatitis, cirrhosis, and increased risk of liver cancer, and liver failure [(3-4)].

Transmission of viral hepatitis may occur by the faecal-oral route often associated with ingestion of contaminated food, depending on the type of hepatitis. Other identified methods of transmission include blood transfusion, tattoos, sexual transmission (through sexual intercourse or through contact with bodily fluids), or parental via mother to child by breast feeding [(4-5)].

Saudi Arabia, as a country of the Middle East, is considered to be an area of the three major types of viral hepatitis A, B and C, mainly A and B. Earlier surveys in Saudi Arabia indicated that hepatitis A virus (HAV) is endemic in Saudi Arabia, with up to 90% of the adult population having positive anti-HAV in some areas and 53% in children [(6)]. Infection is common in developing countries, reaching 100% incidence, but following infection there is life-long immunity [(7, 8)].

There has been dramatic improvement in the levels of personal and public hygiene and in the proportions of the Saudi population, and the impact of these changes on the prevalence of HAV infection must be encouraging. **Figure 1** shows the geographic distribution of HAV

(**quoted from WHO survey data 2009**). Generally speaking, the prevalence of HAV in the Middle East is shown to be high[6-9].

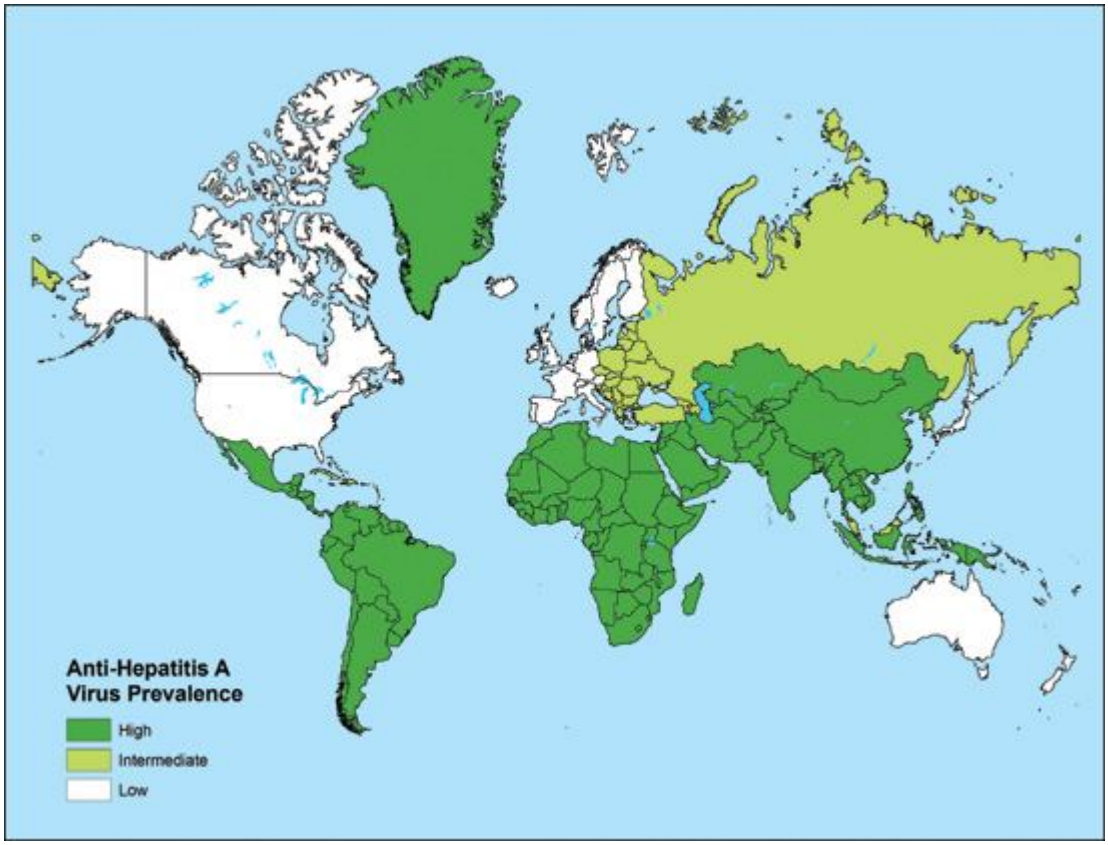

Figure 1. Geographic Distribution of Hepatitis A.

The prevalence of hepatitis B virus (HBV) was also found to be relatively high in Saudi Arabia, according to a study[10] .The study revealed that the overall prevalence of hepatitis B based on the detection of surface antigen (HBsAg) was approximately 17%. However, this rate is also believed to be significantly decreased after the considerable precautions taken by Saudi government. Prevalence of >8% is considered high; 2-8% is intermediate, and <2% is low according to WHO [11-12].

Transmission of hepatitis C virus (HCV) is mainly parental through blood or blood products transfusion and puncture with infected needles. Accordingly, a survey made by [13] showed that the prevalence of HCV (1993-1997) among Saudi blood donors was reported as 2.74% with more than 500,000 Saudi citizens being already infected with HCV. Such a rate is considered close to the prevalence rate estimated by World Health Organization (WHO) of 3% with over 170 million infections [13-14].

Because of the significance of viral hepatitis, and because of its relatively high rate in Saudi Arabia, the government initiated strict measures in order to lower the prevalence rate of viral hepatitis. Amongst the strict measures carried out by the Saudi government is to perform mandatory blood tests for foreign workers and premarital testing in addition to the testing of blood from blood donors in hospitals and health clinics throughout the country.

This study aims to be familiar with the diagnostic procedure followed at Al-Quwayiyah general hospital laboratory, and to keep abreast with the latest figure about the prevalence of viral hepatitis in Al-Quwayiyah area and compare it to that amongst the Kingdom. Furthermore, it aims to know the categories of infected people regarding origin, gender and age, if applicable. Finally, to evaluate the effectiveness of the controlling measures of infectious hepatitis adopted by the Saudi government, via covering a sample area of Al-Quwayiyah.

MATERIALS and METHODS

Al-Quwayiyah Governorate is about 51,000 square kilometres, and located in the heart of the Kingdom in Najd area. Al-Quwayiyah governorate has an estimated population of 126 thousand inhabitant (according to the population estimation in 1431), who afford health services mainly by the general hospital in the city of Al-Quwayiyah[15].

Regarding the testing for viral infectious diseases, the strategy of the hospital is based on receiving blood samples (both plain and heparinized) from potential patients who are divided into two categories; blood donors and others. Blood samples from blood donors are screened by ELISA for Human Immunodeficiency Virus (HIV) antigen and antibodies, Hepatitis C Virus (HCV) antibodies, Hepatitis B Virus (HBV) antigen and antibodies, and Human T-lymphotropic virus (HTLV) antigen. The other category includes premarital testing, residency for outsiders (iqama), and people at-high-risk that referred to the lab by the hospital clinic. Tests for this category include HIV antigen and antibodies, HCV antibodies, and HBV antigens.

Hepatitis A Virus (HAV) is not included within the tests panel because it is reported to be very rarely transmitted parentally (via blood). In addition, the kit for testing HAV is expensive and so it is not applicable to include HAV for usual screening purposes.

Back up samples are stored at -20°C. Positive results are repeated twice for confirmation and only considered if positive is shown at least twice out of the three times. Positive results are then sent to the reference lab in Riyadh for further confirmation using PCR. Results from the serology are then combined with the biochemistry of liver profile before making the final judgement for the case.

Negative results are considered negative where no further testing is done. Back up samples are stored for one month for negative results and positive samples are stored for six months.

RESULTS

This survey was carried out on blood samples taken from potential patients of Al-Quwayiyah general hospital during the year of 1432. The total screened samples were 2,400 with a considerably low prevalence rates for both HBV and HCV as follows:

HBV positive samples were 51 (**Table 1**). Saudi patients were 43 of whom 34 were males, while non-Saudi patients were 8 of whom 7 were males (**Table 2 and Figure 3**). HCV positive samples were 57. Saudi patients were 34 of whom 23 were males, while non-Saudi patients were 23 of whom 19 were males, as shown in **Table 3** and **Figure 4.**

The results also showed that 53% of the positive results belonged to HCV patients, while 47% belonged to HBV patients (**Figure 2**). Saudi: non-Saudi ratio was 5.4:1 for HBV and 1.5:1 for HCV. Male: Female ratio was 4.1:1 for HBV and 2.8:1 for HCV. According to the results, prevalence rates for HBV and HCV were 2.12% and 2.37%, respectively.

Table 1. The total number of seropositive samples for both HBV and HCV.

Types of Hepati*tis*	Total = 108
Hepatitis B	51
Hepatitis C	57

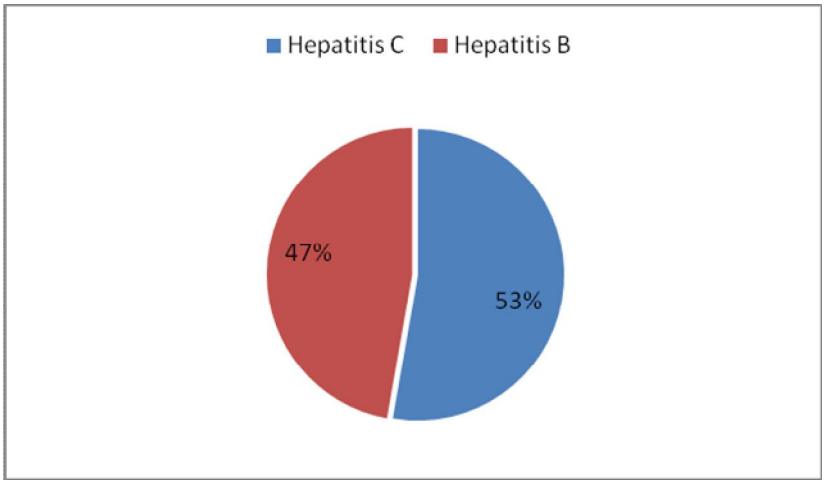

Figure 2. The ratio of HBV:HCV infected patients.

Table 2. The distribution of HBV seropositive samples according to the gender and origin.

	Total =51			
	Saudi		Non Saudi	
Hepatitis B	Males	Females	Males	Females
	34	9	7	1

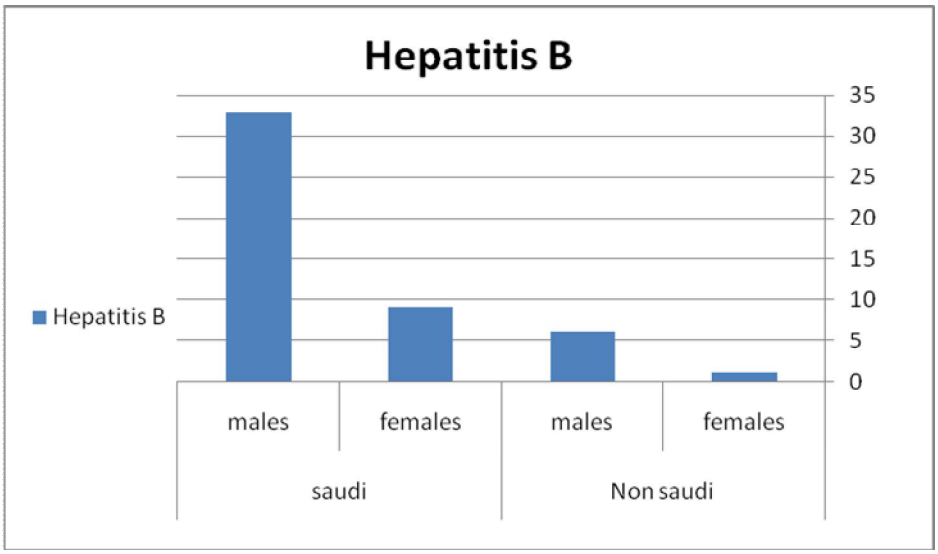

Figure 3. The distribution of HBV seropositive samples according to the gender and origin.

Table 3. The distribution of HCV seropositive samples according to the gender and origin.

	Total =57			
Hepatitis C	Saudi		Non Saudi	
	males	females	Males	females
	23	11	19	4

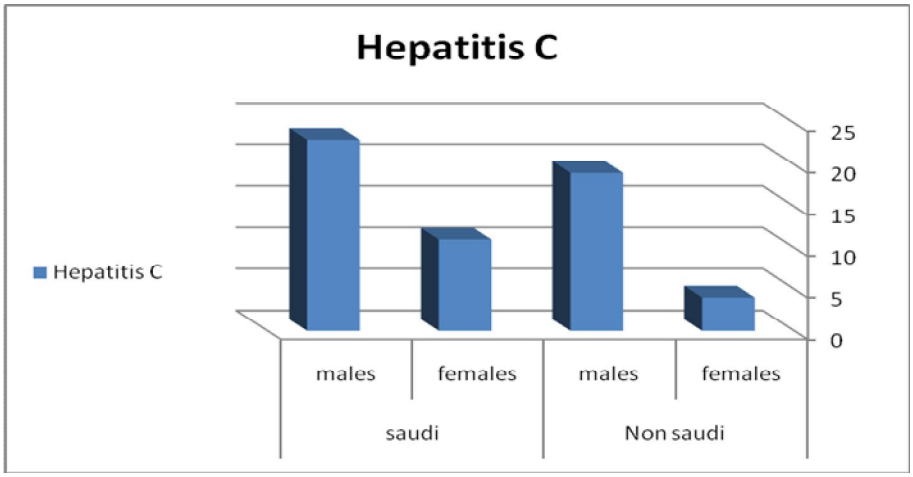

Figure 4. The distribution of HCV seropositive samples according to the gender and origin.

DISCUSSION

The significant improvement in the socioeconomic status within the last two decades is demonstrated by a well-developed road network, communication, water supply, distribution of electricity, as well as a comprehensive health care delivery system in the country, which has dramatically lessened the prevalence of many infectious diseases in the Kingdom wholly and in Al-Quwayiyah Governorate in particular.

From the survey we performed in this study, we can clearly notice the dramatic drop in the prevalence of HBV from the study of 1980s [10], from 17% to 2.1%. Moreover, the prevalence of HCV shown in this study (2.37%) was relatively lower than that in 1990s (2.74%) [10, 13].

Both figures we obtained from the study showed that the prevalence of HBV and HCV in Al-Quwayiyah Governorate is moderate according to WHO scales. The significant drop of prevalence of viral hepatitis is a proof for the success of the controlling measure by the Saudi government so far. It is expected that the prevalence will drop even more in the becoming

few years since the current prevalence rates are very close to the 'low' category of WHO classification. **Figures 5** and **6** show the geographic distribution of Hepatitis B and C, respectively[16-17].

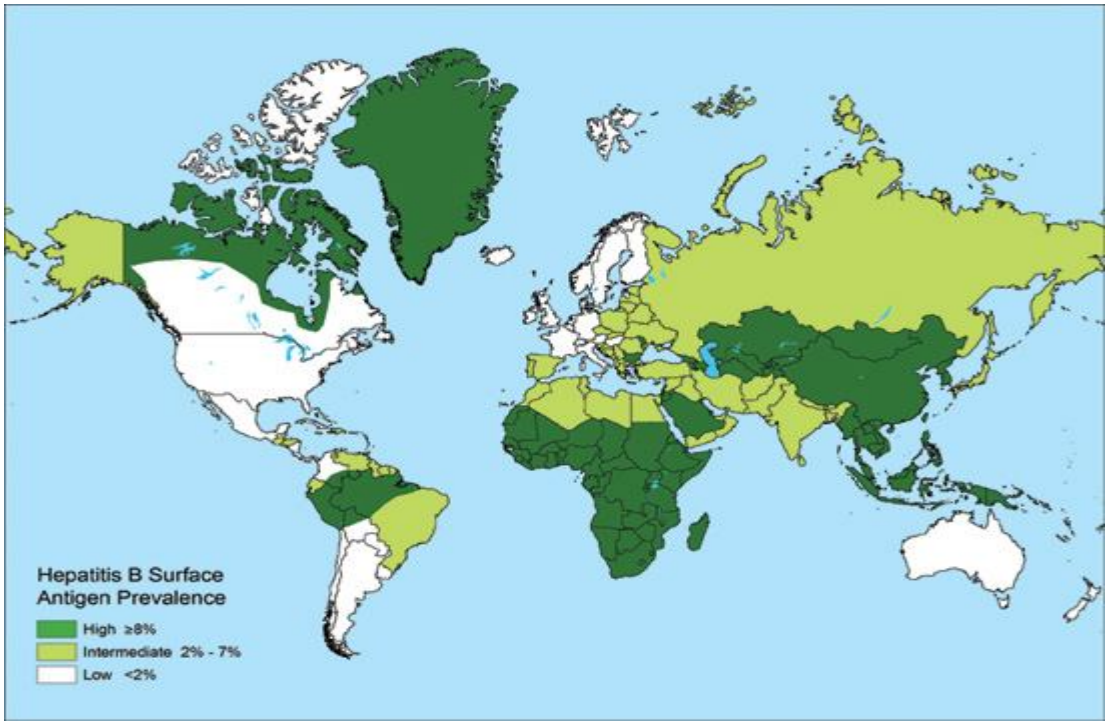

Figure 5. Geographic Distribution of Hepatitis B.

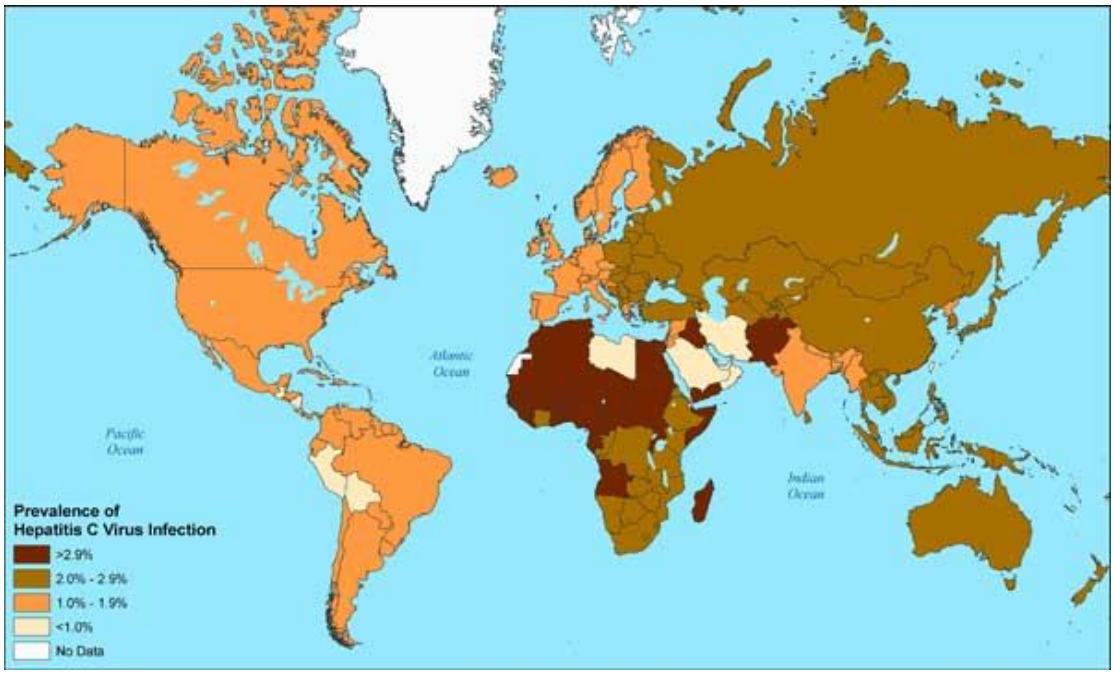

Figure 6. Geographic Distribution of Hepatitis C.

The outcomes of this study have shown that the diagnosed viral hepatitis cases in Al-Quwayiyah Governorate of B and C types are almost the same. Hepatitis A is not routinely screened in this area, but it is expected to have a higher prevalence rate depending on previous surveys. We believe that the including of HAV testing will improve our understanding about its prevalence and how effective the controlling measure it.

The male: female ratio for HBV and HCV shows an apparent higher incidence in males. However, the data we obtained did not show how many samples belong to males or females. It is possible that male potential patients are three to four times more than female potential patients. This possibility can be supported, for example, by the fact that male non-Saudi workers are more in number than females. However, there is evidence that males are more susceptible to viral hepatitis than females shown in a study performed in Libya where the male: female ratio was 2:1[18].

Nevertheless, the higher incidence of HBV and HCV in males in this study is likely to be attributed to the fact that more samples were collected from males. It was not applicable to identify the nationalities of non-Saudi infected patients.

It is worth to point here that the diagnostic procedure followed by Al- Quwayiyah general hospital laboratory is less reputable than that followed by the reference lab in Riyadh. In Riyadh, seropositive samples of the preliminary screening by ELISA are confirmed by Western Blotting technique (RIBA). Furthermore, negative samples are not considered negative before being compiled with liver biochemistry profile, since the virus has incubation period during which it cannot be detected using screening conventional techniques.

CONCLUSION

Viral hepatitis is one of the main contagious diseases worldwide. Its prevalence in the Kingdom was considered high two to three decades ago but its prevalence seems to be noticeably declined nowadays because of the successful and responsible way the Saudi government dealt with it through adopting strict controlling measure by improving the quality of health care and performing continuous and comprehensive screening for all potential hepatitis patients.

ACKNOWLEDGEMENT

We are grateful to the manager and laboratory team at Al-Quwayiyah General Hospital for

providing us with the valuable results.

REFERENCES

1. Gallegos-Orozco JF, Rakela-Brödner J (2010). Hepatitis viruses: not always what it seems to be. Revista médica de Chile 138(10):1302-1311.
2. Murray, P. R., Rosenthal, K. S. & Pfaller, M. A. (2005). Medical Microbiology 5th ed., Elsevier Mosby.
3. Hepatitis A Symptoms" http://www.emedicinehealth.com/hepatitis_a/page3_em.htm#Hepatitis%A%20Symptoms . eMedicineHealth.
4. Brundage SC, Fitzpatrick AN (2006). "Hepatitis A". American Family Physician 73 (12): 2162–2168.
5. Hepatitis A Information for the Public" (http://www.cdc.gov/hepatitis/A/aFAQ.htm).
6. Al Rashed RS (1997). “Prevalence of Hepatitis A Virus Among Saudi Arabian Children: A Community-Based Study”. Annals of Saudi Medicine 17(2):200-203.
7. Clinical course and consequences of hepatitis A infection". Vaccine 18: 71–74.
8. Ryan KJ, Ray CG (2004). Sherris Medical Microbiology (4th ed.). McGraw Hill. pp. 541–544 and 551-552.
9. Jacobsen K, Wiersma S (2010). "Hepatitis A virus seroprevalence by age and world region, 1990 and 2005". Vaccine 28 (41): 6653–6657.
10. El-Hazmi MA (1989). “Hepatitis B virus in Saudi Arabia”. Journal of Tropical Medical Hygiene 92(1):56-61.
11. Alter, M. (2003). "Epidemiology and prevention of hepatitis B". Seminars in liver disease 23 (1): 39–46.
12. Al-Faleh FZ et al (1992). “Seroepidemiology of hepatitis B virus infection in Saudi Arabian children: A baseline survey for mass vaccination against hepatitis B”. Journal of Infection 24(2):197-206.
13. Akbar HO (2004). “Hepatitis C virus infection in Saudi Arabia”. Saudi Journal of Gastroenterology 10(3):127-131.
14. Caruntu FA, Benea L (2006). "Acute hepatitis C virus infection: Diagnosis, pathogenesis, and treatment" 15(3): 249–256.
15. Official site of Al-Quwayiyah, Saudi Arabia (http://www.alquwayiyah.gov.sa).

16. Kurbanov F, Tanaka Y, Mizokami M (2010). "Geographical and genetic diversity of the human hepatitis B virus". Hepatology Research 40 (1): 14–30.
17. Custer; Sullivan, S.; Hazlet, T.; Iloeje, U.; Veenstra, D.; Kowdley, K. (2004). "Global epidemiology of hepatitis B virus". Journal of Clinical Gastroenterology 38: 158–168.
18. Qatrani H, et al (2007). “Demographic factors ibfluencing hepatitis B and C infection in Benghazi, Libya”. Eastern Mediterranean Health Journal 13(1):85-97.