

Sero-Prevalence of Hepatitis C virus Antibody Among Screened Populations and Certain Risk groups in Al-Anbar Governorate, West of Iraq

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Abstract

Globally an estimated 130–170 million persons (2%–3% of the world's population) are living with hepatitis C virus (HCV) infection. This infection, particularly in its chronic form, is associated with sizable morbidity and mortality. More than 350 000 deaths are attributed to HCV infection each year, most of which are caused by liver cirrhosis and hepatocellular carcinoma (HCC).

Objective: - This study aims to determine the prevalence of anti HCV antibody in AL-Anbar governorate among screened groups.

Patients and Methods: - This is a retrospective study conducted and achieved in Al-Anbar Central Laboratory during the period from January to Dec 2012. Requestionary sheet included age and sex. The sera from study group

Individuals were submitted for screening by preliminary screening test, dipstick immunoassay which depends on immuno-chromatography for detection of anti HCV antibody. After that all Anti-HCV antibody positive sera were examined for the presence of anti HCV antibody by enzyme linked immunosorbent assay (ELISA) for 1-blood donor's. 2-Rotein screened populations [contacts, pre-marriage, before surgery, before Endoscopic and dental procedures and among 3- certain risk groups [pregnant women, midwives and health worker].

Result: - Our study revealed the prevalence of anti HCV antibody was 0.16% among blood donors. 0.00% among health workers and midwives. (0.05%) among contacts. (0.07%), among participants with non-urgent operation. (0.10%) among pregnant women and with 3.53% among Routine screened population.

Conclusion: - The prevalence of hepatitis C virus antibody is high among routine screened population and low among certain high risk groups. Although there is discrepancy between these two groups HCV screening is highly recommended.

Key words: - *Anti HCV, HCV, statistical parameters, ELISA*

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Introduction

Globally an estimated 130–170 million persons (2%–3% of the world's population) are living with hepatitis C virus (HCV) infection¹. This infection, particularly in its chronic form is associated with sizable morbidity and mortality. More than 350 000 deaths are attributed to HCV infection each year, most of which are caused by liver cirrhosis and hepatocellular carcinoma (HCC)². An estimated 27% of cirrhosis and 25% of HCC can be attributed to hepatitis C worldwide and disease rates can be even more substantial in countries with a high burden of infection. For example in Japan, up to 90% of all reported cases of HCC are caused by HCV infection². HCV infection is a major cause of liver disease among the general population leading to chronic active hepatitis with or without cirrhosis in 50% of case³. If left untreated chronic hepatitis C progress to cirrhosis and in certain countries it is a major cause of primary hepatic carcinoma⁴. In HD centers HCV is also a major problem and is prevalent both in pre-dialysis population and more significantly in patients on maintenance HD⁵⁻⁷.

Hepatitis C virus is usually spread by sharing infected needles with a carrier from receiving infected blood and from accidental exposure to infected blood. Some people acquire the infection through non parenteral means that have not been fully defined but include sexual transmission in persons with high risk behaviors although transmission of HCV is less common than that of HBV and HIV⁸⁻¹⁰. HCV is not spread by breast feeding, sneezing, coughing, hugging, sharing eating utensils or drinking glasses other normal social contact, food or water¹¹. Mother to baby transmission is now well documented but uncommon¹². Needs a high viraemia (>1 log) as found in HIV co-infection¹³.

Objective: - This study has been undertaken for determining the prevalence of the HCV antibody in AL- Anbar governorate among screened of different groups.

Patients and Methods:-

This is a retrospective record based study conducted in Al-Anbar central Laboratory from January to December 2012. Requestionary sheet included age and sex.

Study groups:-

The study group population submitted to study techniques include.1- blood donors.2- Routine screened population include [before marriage, before endoscopic and dental procedures. 3-Among certain risk include [health workers, contact persons [those who in contact with Anti HCV antibody positive patients], mid-wife, non-urgent operation and pregnant women.

Study techniques:-

Dipstick immunoassay and Enzyme linked immunosorbent assay:- The sera from study group individuals were submitted for screening by preliminary screening test, dipstick immunoassay which depend on immuno-chromatography for detection of anti HCV antibody. After that all Anti-HCV antibody positive sera were examined for the presence of anti HCV antibody by enzyme linked immunosorbent assay (ELISA).

Statistical analysis:-

Date was manually analyzed or by SPSS version 18, frequency distribution tables were arranged, X2Chi-Square Test and Paired Samples T test, significance applied test P value less than 0.05 was considered significant.

Results

The total blood donors screened were 16076 only 26 from them had positive hepatitis C antibody. Prevalence among blood donors was 0.16%. 0.00% among health workers and midwives.

0.05% among contacts. 0.07% among participants with non-urgent operation. 0.10% among pregnant women and 3.53% among routine screened groups. All these findings were shown in following tables and figures.

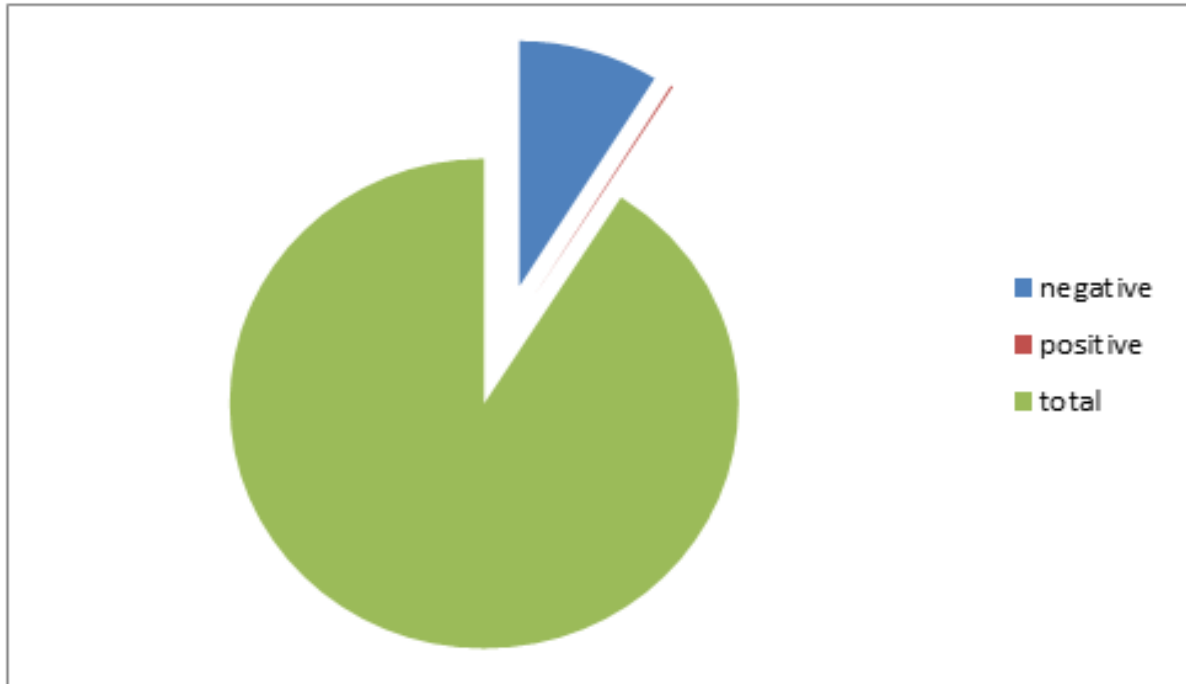


Fig 1. prevalence among blood donors

Table 1. Prevalence of HCV among certain risk groups

Risk groups tested	Total screened	positive	prevalence
Health worker	359	0	0.0%
Contacts	3820	2	0.05%
Midwife	157	0	0.0%
non urgent operation	10630	8	0.07%
Pregnant women	3914	4	0.10%

Table 2. Prevalence of HCV among routine screened populations [before marriage, dental and endoscopic procedure] according to age groups and sex. considering no significant difference between these variables (P value = 1.136).

Age Group	Tested for HCV		Total	Positive		Total positive	Prevalence		
	Male	Female		Male	Female		Male	Female	Study Population
<5years	5	31	36	0	0	0	0.00%	0.00%	0.00%
5-14	155	198	353	0	3	3	0.00%	1.52%	0.85%
15-44	301	378	679	19	13	32	6.31%	3.44%	4.71%
≥ 45	142	121	263	7	5	12	4.93%	4.13%	4.56%
total	603	728	1331	26	21	47	4.31%	2.88%	3.53%

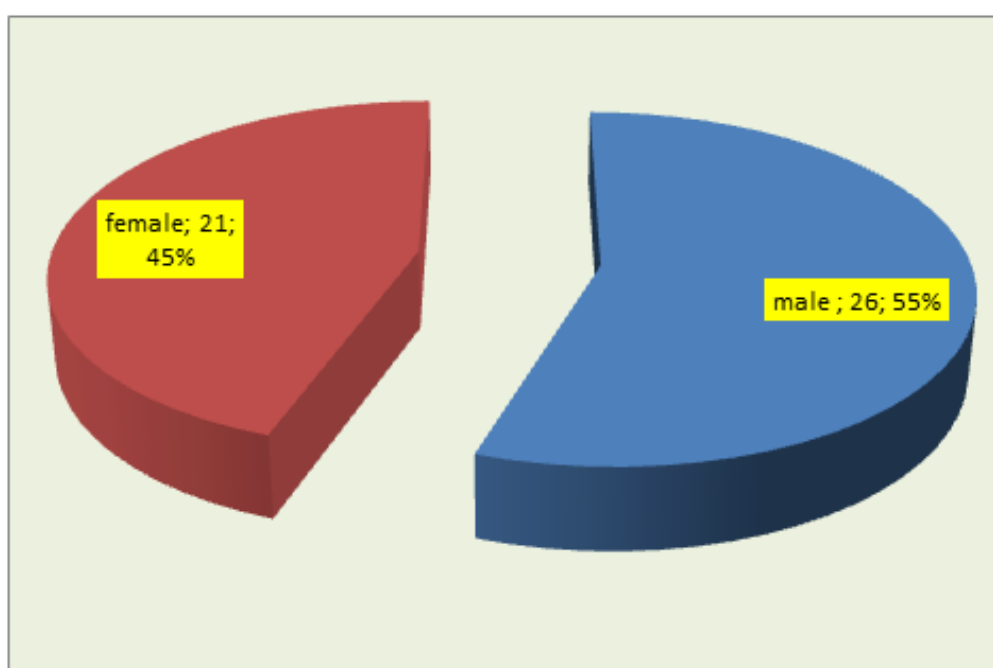


Figure 2. Distribution of patients with HCV according to sex in considering no significant difference between these variables ($X^2=0.53$; P value=0.46).

Discussion

Our study revealed that prevalence of positive HCV antibody among blood donors was 0.16%. This prevalence is lower than that reported in Baghdad study (2006-2009)¹⁴ as 0.3% and Lebanon study (1997-2000)¹⁵ as 0.6%. In Arab countries, blood transfusion is still a problem due to the lack of organized infrastructure and highly trained and qualified staff. The main sources of blood donation are usually relatives and friends of the patients who come for social pressure and due to the fear of the death of a patient (i.e. relative). Donors usually come in emergency time, and questions about high-risk behaviors are seldom asked¹⁶. Therefore, resources and organization should be available to recruit altruistic volunteers.

The current study revealed that the prevalence of HCV antibody was 0.00% for health workers our finding was similar to Sudan study [2008]¹⁷ and lower than reported in Damascus, Syria study [2002]¹⁸ as 3% and Lebanon study [2001]¹⁹ as rang 0.16-1.22%. This might be attributed to good precautions and health education effort to prevent HCV among risky groups.

This study recorded the prevalence of HCV antibody among contacts was 0.05% which is lower than that reported in Iran study (2006)²⁰ as 1.33%..

This study revealed that the prevalence of HCV antibody among those underwent non-urgent operation was 0.07%. This prevalence is lower than that reported by Turkey study (2008)²¹ as 1.6% 81 and Pakistan study (2009)²² as 2.3%.

The observed HCV antibody prevalence among pregnant women by this study was 0.10%. This prevalence is lower than that reported in previous Iraqi study (2002)²³ as 3.21%, Pakistan study (2009)²² as 1.8% and Algeria study (2007)²⁴ as 0.19%. Interfamilial transmission of HCV is not the significant transmission route and sexual transmission does not seem to play a role in the interfamilial spread of HCV infection²⁰.

Previous studies showed that outbreaks of HCV transmission have been linked to a number of medical procedures, including the use of contaminated multi-dose vials²⁵, surgical²⁶ and gastrointestinal endoscopy²⁷. In addition, traveling abroad is associated with increased risk of hepatitis virus infection especially when traveling to high endemic area²⁸. Some patients in Al-Anbar were found to be treated in outside countries that represented as a risk factor.

The prevalence of hepatitis C antibody in present study among routine screened populations was 3.53%. This prevalence is higher than that reported by WHO (2006) for Iraq as 0.6%²⁹ and lower than that reported by Iraq study (2008)³⁰ as 7.1% in general population.

The prevalence of 3.53% is lower than that reported in Bahrain (2004)³¹ as 9.24%, and is consistency with Jordan (2002)³² as 0.65%-6.25% depended on sub-population studied, and higher than reported by Syria (2000)³³ as 1% and lower than reported by Egypt (2009)³⁴ as 12.1%-22.1%.

Different habitual and biosocial behaviors have reflected on the endemicity of HCV among Arab countries. Indeed children and young adults in Arab countries have a relatively high HCV prevalence, although it is less than in the older population, which suggests that HCV transmission continues in these communities³⁵. A variety of contributing factors may be involved and it becomes imminent that strategies should be implemented to overcome such potential risks. Unsafe use of unsterilized injection is a major risk factor of HCV in Arab communities. It is likely that injections given in rural communities by both traditional and nontraditional health care providers are an important cause of HCV transmission, particularly in countries like Egypt, Sudan, Mauritania, Morocco, Algeria, Iraq, and Yemen.

The importance of combating this ubiquitous risk in prevention programs cannot be overstated. A study carried out by World Health Organization (WHO) on the global use of injection has shown that most of the Arab countries have serious problems in using injection in their communities. Eastern Mediterranean region D which mainly includes Egypt, Iraq, Morocco, Yemen, and Sudan has the highest injection per person associated with lack of sterilization. Interestingly, injection practices are safer in sub-Saharan African than in these countries³⁶.

Demographic analysis of hepatitis C patients revealed that most of patients were in age group 15-44 years with predominance of male gender. This finding is in agreement with results of studies in Italy (1992)³⁷ and Saudi Arabia (1995)³⁸. Although it is inconsistent with Baghdad study (2006-2009)¹⁸, in which the women were more than men. This inconsistency might be attributed to social factors in Al-Anbar province that led to male predominance in blood donation.

Limitations of the study

1. Type of this study is observational descriptive study (cross sectional), and the causal relationship cannot be estimated.
2. Recall bias as data collected were dependent on memory of the patients.
3. Financial burden caused by different laboratory tests for the patients which were highly expensive included viral load.
4. Results of this study cannot be generalized on Iraqi population.
5. lack of some information taken from donors regarding exposure to risk factors associated with the transmission of virus, for example, history of blood transfusion, dental extraction, cupping and tattooing, that were carried out within the incubation period for both viruses.

References

- 1-World Health Organization. Global burden of disease (GBD) for hepatitis C. J Clin Pharmacol 2004; 44:20-9.
- 2-Perz JF, Armstrong GL, Farrington LA, Hutin Y, Bell B. The contributions of hepatitis B virus and hepatitis C virus infections to cirrhosis and primary liver cancer worldwide. J Hepatol 2006; 45:529-38.
- 3-ALKhader AA. Hepatitis C infection: the subject of this issue. Saudi J Kidney Dis Transplant 1995; 6(2):115-117.
- 4-Okuda K, Hayashi H. Hepatitis C virus infection among maintenance hemodialysis patient: a preventable problem of the world. Saudi J Gastroenterol 1996; 2(1):1-7.
- 5-Yonemura K, Hishida A, Yoneyama T. High prevalence of hepatitis C virus antibody in patients with chronic renal failure at the start of hemodialysis therapy. Nephron 1996; 73:484-485.
- 6-Conlon PJ, Walshe JJ, Smyth EG. Lower prevalence of anti hepatitis C antibody in dialysis and renal transplant patients in Ireland. Ir J Med Sci 1993; 162(4): 145-147.
- 7-Yamaguchi K, Nishimura Y, Fukuoka N. Hepatitis C virus antibodies in hemodialysis patients. Lancet 1990; 335:1409-1410.
- 8- Alter MJ. Hepatitis C virus infection in the United States. Journal of Hepatology, 1999, 31:88-91
- 9-Hsu HH, Greenberg HB. Hepatitis C. In: Hoeprich PD, Jordan MC, Ronald AR, eds. Infectious Diseases. A treatise of infectious processes., 5th ed. JB Lippincott Co, Philadelphia, 1994:820-825
10. Viral Hepatitis Prevention Board. Hepatitis A, B & C: defining workers at risk. Viral Hepatitis, 1995, 3.
11. Mast EE, Alter MJ, Margolis HS. Strategies to prevent and control hepatitis B and C virus infections: a global perspective. Vaccine, 1999, 17:1730-1733
12. Houghton M. Hepatitis C viruses. In: Fields BN, Knipe DM, Howley PM, eds. Fields Virology, 3rd ed. Philadelphia, Lippincott - Raven, 1996:1035-1058
13. EASL International Consensus Conference on Hepatitis C. Consensus Statement. Journal of Hepatology, 1999, 31:3-8
- 14-Ataallah TM, Hanan KA, Maysoun KS, Sadoon AA. Prevalence of hepatitis B and C among blood donors attending the National Blood Transfusion Center in Baghdad, Iraq from 2006-2009. Saudi Med J. 2011 Oct; 32 (10):1046-50.

- 15-Irani-Hakime N, Tamim H, Samaha H, Almawi WY. Prevalence of antibodies against hepatitis C virus among blood donors in Lebanon, 1997-2000. *Clin Lab Haematol* 2001; 23 (5):317-23.
- 16-Al-Hawsawi Z M. Prevalence of hepatitis C virus antibody," *Annals of Saudi Medicine* 2000; 20(5-6): 488-489
- 17- Nail A, Eltiganni S, Islam A. Seroprevalence of Hepatitis B and C among health care workers in Omdurman, Sudan. *Sudan JMS*. 2008;3:201-7
- 18- Othman BM , Monem FS, Prevalence of hepatitis C virus antibodies among health care workers in Damascus, Syria . *Saudi Med J* 2001; 22 {7}:603-5.23.
- 19-N.Lrani-Hakime, J.P. Aoun, S. Khoury, H.R. Samaha, H. Tamim, and W.Y. Almawi . Seroprevalence of hepatitis C infection among health care personal in Beirut, Lebanon , *American Journal of Infection Control* , vol.29, no.1, pp.20-23, 2001.
- 20-Hajjani E, Masjedizadeh R, Hashemi J, Azmi M, Rajabi T. Hepatitis C virus transmission and its risk factors within families of patients infected with hepatitis C virus in southern Iran: Khuzestan. *World J Gastroenterol* 2006; 12 (43):7025-8.
- 21-Altuglu I, Soyler I, Ozacar T, Erensoy S. Distribution of hepatitis C virus genotypes in patients with chronic hepatitis C infection in Western Turkey. *Int J Infect Dis* 2008; 12 (3): 239-44.
- 22-Vickerman P, Platt L, Hawkes S. Modelling the transmission of HIV and HCV among injecting drug users in Rawalpindi, a low HCV prevalence setting in Pakistan. *Sex Transm Infect* 2009; 85 (2):ii23-30.
- 23-Al-Kubaisy WA, Niazi AD, Kubba K. History of miscarriage as a risk factor for hepatitis C virus infection in pregnant Iraqi women. *East Mediterr Health J* 2002; 8 (2-3):239-44.
- 24-Spinella PC, Perkins JG, Grathwohl KW. Risks associated with fresh whole blood and red blood cell transfusions in a combat support hospital. *Crit Care Med* 2007; 35 (11):2576-81.
- 25-Macedo de Oliveira A, White KL, Leschinsky DP. An outbreak of hepatitis C virus infections among outpatients at a hematology/oncology clinic. *Ann Intern Med* 2005; 142:898-902.
- 26-Massari M, Petrosillo N, Ippolito G. Transmission of hepatitis C virus in a gynecological surgery setting. *J Clin Microbiol* 2001; 39:2860-2863.
- 27-Ross RS, Viazov S, Roggendorf M. Phylogenetic analysis indicates transmission of hepatitis C virus from an infected orthopedic surgeon to a patient. *J Med Viro* 2002; 66:461-467.
- 28-Jaureguiberry S, Grandiere-Perez L, Ansart S. Acute hepatitis C virus infection after a travel in India. *J Travel Med* 2005; 12: 55-56.
- 29-World Health Organization. Viral hepatitis program in Iraq. WHO/EMRO.2006.
- 30-Khattab OS. Prevalence and risk factors for hepatitis C virus infection in hemodialysis patients in an Iraqi renal transplant center. *Saudi J Kidney Dis Transpl* 2008; 19 (1):110-5.
- 31-Qadi AA, Tamim H, Ameen G. Hepatitis B and hepatitis C virus prevalence among dialysis patients in Bahrain and Saudi Arabia: A survey by serologic and molecular methods. *Am J Infect Control* 2004; 32 (8):493-5.
- 32-Quadan A. Prevalence of anti-hepatitis C virus among the hospital populations in Jordan. *New Microbiol* 2002; 25 (3):269-73.
- 33-Othman BM, Monem FS. Prevalence of hepatitis C virus antibodies among health care workers in Damascus, Syria. *Saudi Med J* 2001; 22 (7):603-5.
- 34-Youssef A, Yano Y, Utsumi T. Molecular epidemiological study of hepatitis viruses in Ismailia, Egypt. *Intervirology* 2009; 52 (3):123-31.
- 35-Arafa N, El Hoseiny M, Rekacewicz C. Changing pattern of hepatitis C virus spread in rural areas of Egypt. *Journal of Hepatology* 2005; 43(3): 418-424.
- 36-Hutin YJF, Armstrong GL. Use of injections in healthcare settings worldwide, 2000: literature review and regional estimates. *British Medical Journal* 2003; 327 (7423): 1075-1078.
- 37-Dentico P, Buongiorno R, Volpe A. Prevalence and incidence of hepatitis C virus (HCV) in hemodialysis patients: study of risk factors. *Clin Nephrol* 1992; 38(1):49-52.
- 38-Huraib S, AlRashed R, Aldrees A, Aljefry M. High prevalence of and risk factors for hepatitis C in haemodialysis patients in Saudi Arabia: a need for new dialysis strategies. *Nephrol Dial Transplant* 1995; 10:470-474.