

Prevalence of Hepatitis C in Pregnant Women in Egypt

Mohamed Samir Mohamed Fouad¹, Mahmoud Samy Zaky¹, Mohamed Abd El Hakiim Rizk², Mohamed Saeed Elshorbagy³, Mohamed Hamza Saleh¹

¹Obstetrics & Gynecology Department, Faculty of Medicine, Al-Azhar University, Egypt

²Public Health & Community Medicine Department, Faculty of Medicine, Al-Azhar University, Egypt

³Clinical Pathology Department, Faculty of Medicine, Al-Azhar University, Egypt

Medokshk88@gmail.com

Abstract: Background: Infection with the hepatitis C virus (HCV) affects 2% - 3% of the world's population. The Egyptian Demographic Health Survey (EDHS), a cross sectional survey including hepatitis C virus (HCV) biomarkers, was conducted in 2008 on a large nationally representative sample. It estimated HCV prevalence among the 15–59 years age group to be 14.7%. Accordingly, Egypt has the highest HCV prevalence in the world. This unparalleled level of exposure to this infection appears to reflect a national level epidemic. It has been postulated that the epidemic has been caused by extensive iatrogenic transmission during the era of parenteral-antischistosomal-therapy (PAT) mass-treatment campaigns. **Objectives:** To find out the prevalence of accidentally discovered cases of HCV infection among pregnant women who give no history of any hepatic disease. To check for the possibility of making Hepatitis-C screening a routine investigation during pregnancy. **Patients and Methods:** The study is a cross-sectional study. This study will be recruited from obstetric & gynecology department at Luxor International Hospital. Over a period of seven months starting from March 2017 to October 2017. The stored serum will be analyzed for hepatitis-C antibody by A con cards which is rapid method for qualitative detection of HCV-ab. Then positive samples will be submitted to more confirmatory test (bioelisa HCV 4.0) the result will take the form of positive versus Negative. **Results:** Our work is a cross-sectional study depending on the screening of blood samples withdrawn from (216) pregnant women. 15(6.9%) women were positive for both HCV antibodies (Ab) and HCV-RNA, women positive to Ab but negative to HCV-RNA were excluded due to cross antigenicity known between HCV and other diseases. In an investigation of 2,644 blood donors from 26 Egyptian governorates, those with highest prevalence were located in the central and northeastern Nile Delta and the Nile valley. However of those 15 pregnant women positive to HCV both by AB. and PCR, 6 (40%) had a history of blood transfusion. **Conclusion:** In view of the results of the current work, the vertical transmission of HCV is not confirmed, further studies together with long term follow up of seropositive mothers and their neonates are recommended. HCV infection doesn't increase the risk of obstetric complications.

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Keywords: Hepatitis C, Pregnant Women, Egyptian Demographic Health Survey, alanine aminotransferase.

1. Introduction

Infection with the hepatitis C virus (HCV) affects 2% - 3% of the world's population⁽¹⁾. The Egyptian Demographic Health Survey (EDHS), a cross sectional survey including hepatitis C virus (HCV) biomarkers, was conducted in 2008 on a large nationally representative sample⁽²⁾. It estimated HCV prevalence among the 15–59 years age group to be 14.7%⁽²⁾. Accordingly, Egypt has the highest HCV prevalence in the world^(3,4).

This unparalleled level of exposure to this infection appears to reflect a national level epidemic. It has been postulated that the epidemic has been caused by extensive iatrogenic transmission during the era of parenteral-antischistosomal-therapy (PAT) mass-treatment campaigns^(5,6).

Today, HCV infection and its complications are among the leading public health challenges in Egypt⁽⁷⁾.

During pregnancy in chronic HCV infection a significant reduction in the mean alanine aminotransferase (ALT) levels has been reported^(8,9), with rebound during the postpartum period. However, when we consider a cohort of pregnant women with HCV infection and persistently high aspartate aminotransferase/ALT levels, this trend is not confirmed⁽⁹⁾.

The release of endogenous interferon from the placenta during pregnancy might partly explain changes in liver enzymes, but does not interfere with viral clearance⁽⁹⁾.

There is no unfavorable effect of HCV on pregnancy. In particular, three studies have addressed this question⁽¹⁰⁾.

Taken together, these three studies have documented a good fetal outcome. The rate of cesarean section was significantly higher in the study by Hilleman et al.⁽¹¹⁾.

Compared to controls (42% vs 21%, $P = 0.004$) and was similar to that observed in the Italian study⁽¹²⁾.

Aim of the Work

Primary Objective:

To find out the prevalence of accidentally discovered cases of HCV infection among pregnant women who give no history of any hepatic disease.

Secondary Objective:

To check for the possibility of making Hepatitis-C screening a routine investigation during pregnancy.

2. Patients and Methods

Study type:

The study is a cross-sectional study.

Place of the study:

This study will be recruited from obstetric & gynecology department at Luxor International Hospital.

Time of the study:

Over a period of seven months starting from March 2017 to October 2017.

Inclusion criteria:

Patients recruited for the study are:

- 1- Pregnant women who come to the hospital for antenatal at outpatient clinic.
- 2- Pregnant women who admitted to the hospital.
- 3- Free from any hepatic diseases or history.

Exclusion criteria:

Patients with History of hepatitis, jaundice, or fever hospital admission.

Work of the study:

Written consent from each patient was taken first then the following was done:

1. Careful history taken to check for meeting inclusion and exclusion Criteria.
2. General examination for: Body weight and height, blood pressure was measured in semi-sitting position with standard mercury sphygmomanometer with an appropriate sized cuff, lower limbs examination.
3. Abdominal examination for estimation of fundal level and auscultation of fetal heart sound.
4. Routine investigations: Maternal venous blood samples was obtained for routine investigations.
5. **Blood sample collection:** a venous blood sample was collected from each woman of 3-4 ml blood.

The collected venous blood samples was centrifuged; the resultant serum was stored at -20°C until assayed collectively

Laboratory analysis:

The stored serum will be analyzed for hepatitis-C antibody by A con cards which is rapid method for qualitative detection of HCV-ab. Then positive samples will be submitted to more confirmatory test (bioelisa HCV 4.0) the result will take the form of positive versus Negative.

Statistical Analysis

The results was tabulated and statistically analyzed using a computer program SPSS (statistical package for social science), using the appropriate statistical tests. The resulting data were then re-tabulated and discussed.

3. Results

Table 1: Demographic characteristics among studied cases

Characteristics	Mean±SD	Range	
Age (years)	29.1±5.8	17.0–41.0	
BMI (kg/m ²)	27.3±3.6	19.9–36.1	
Parity	2.1±1.4	0.0–5.0	
GA (weeks)	35.0±2.2	29.0–38.0	
	N	%	
Parity	Primi	53	24.5
	Multi	163	75.5

Total=216, BMI: Body mass index, GA: Gestational age

Table (1) shows that: **Demographic characteristics** among studied cases.

Table 2: Pre labor findings among studied cases

Characteristics	Mean±SD	Range	
SBP (mmHg)	121.2±24.0	90.0–200.0	
DBP (mmHg)	74.6±14.6	60.0–110.0	
	N	%	
Elevated liver enzymes [^]	16	7.4	
Lower limb edema	98	45.4	
Lower limb edema grade#	Severe	38	38.8
	Mild	60	61.2

SBP: Systolic blood pressure, DBP: Diastolic blood pressure, [^]More than two folds over the normal limit, #Among cases with lower limb edema

Table (2) show that: **Pre labor findings** among studied cases.

Table 3: Comparison according to HCV status regarding demographic characteristics

Characteristics	Positive (N=15)	Negative (N=201)	P	OR (95% CI)
Age (years)	30.3±6.4	29.0±5.7	∩0.414	--
BMI (kg/m ²)	27.7±4.0	27.3±3.6	∩0.664	--
Parity	2.7±1.3	2.1±1.4	∩0.082	--
GA (weeks)	34.3±2.6	35.1±2.2	∩0.159	--
Parity	Primi	2 (13.3%)	§0.370	0.45 (0.10–2.07)
	Multi	13 (86.7%)		

BMI: Body mass index, GA: Gestational age, ∩Independent t-test, §Fisher's Exact test, OR: Odds ratio, CI: Confidence interval, *Significant

Table (3) show that: **Multiparous** were non-significantly more frequent among positive HCV cases.

Table 4: Comparison according to HCV status regarding pre labor findings

Characteristics	Positive (N=15)	Negative (N=201)	P	RR (95% CI)
SBP (mmHg)	116.0±17.6	121.5±24.4	∩0.389	--
DBP (mmHg)	70.0±12.0	74.9±14.7	∩0.207	--
Elevated liver enzymes [^]	8 (53.3%)	8 (4.0%)	§<0.001*	14.29 (5.94–34.35)
Lower limb edema	9 (60.0%)	89 (44.3%)	∞0.238	1.81 (0.67–4.90)
Lower limb edema grade#	Severe	7 (77.8%)	§0.026*	5.53 (1.21–25.22)
	Mild	2 (22.2%)		

SBP: Systolic blood pressure, DBP: Diastolic blood pressure, [^]More than **two** folds over the normal limit, #Among cases with lower limb edema, ∩Independent t-test, ∞Chi square test, §Fisher's Exact test, RR: Relative risk, CI: Confidence interval, *Significant

Table (4) show that: **Elevated liver enzymes** and **severe lower limb edema** were significantly more frequent among positive HCV cases.

4. Discussion

Hepatitis C Virus (HCV) is recognized as a major threat to global public health. An estimated 170 million people worldwide are infected, most of them chronically infected and at risk for liver cirrhosis and hepatocellular carcinoma (HCC). HCV-associated mortality is expected to increase substantially in the next 20 years⁽¹³⁾.

Infection with the hepatitis C virus (HCV) affects 2% - 3% of the world's population⁽¹⁾.

The Egyptian Demographic Health Survey (EDHS), across sectional survey including hepatitis C virus (HCV) biomarkers, was conducted in 2008 on a large nationally representative sample⁽²⁾. It estimated HCV prevalence among the 15–59 years age group to be 14.7%⁽²⁾.

It has been postulated that the epidemic has been caused by extensive iatrogenic transmission during the era of parenteral-antischistosomal-therapy (PAT) mass-treatment campaigns⁽⁵⁾.

Our work is a cross-sectional study depending on the screening of blood samples withdrawn from (216) pregnant women. 15(6.9%) women were positive for

both HCV antibodies (Ab) and HCV-RNA, women positive to Ab but negative to HCV-RNA were excluded due to cross antigenicity known between HCV and other diseases.

The U.S. blood donors have been screened for HCV antibodies since May 1990. This screening has reduced the risk per unit to 0.03%, or about 3 per 10,000 units transfused. Investigations in Egypt have reported a strikingly high prevalence of hepatitis C (Anti-HCV) among blood donors and patients with exposure to blood and blood products. Antibody prevalence in blood donors ranged from 6% to 38% and averaged approximately 15%⁽⁶⁾.

In an investigation of 2,644 blood donors from 26 Egyptian governorates, those with highest prevalence were located in the central and northeastern Nile Delta and the Nile valley⁽¹⁴⁾.

However of those 15 pregnant women positive to HCV both by AB. and PCR, 6 (40%) had a history of blood transfusion.

The apparently high prevalence of HCV infection in Egypt is of importance because of the potential adverse impact of HCV on public health in Egypt, where an estimated 400,000 units of blood are transfused annually⁽¹⁵⁾.

Our study show that blood transfusion increase the incidence of HCV and this is in agreement with

who found that a history of blood transfusion increase the incidence of HCV⁽¹⁶⁾.

Also this is in agreement with study In the United States on 912 people who received transfusions between 1985 and 1991 found that the risk for HCV infection was 0.45% per unit transfused before donor blood screening began. The prevalence of HCV is 6.9% and this is lower percent if compared with study was done at Benha University from October 2003 on 1224 pregnant women. They completed a questionnaire about risk factors for HCV acquisition and suspected risk factors for mother-to-infant transmission and were tested for HCV antibody using a third-generation ELISA test. Women positive for HCV antibody were tested for HCV RNA by polymerase chain reaction. Peripheral blood of infants of positive women was tested for HCV antibody and HCV-RNA at 1 and after 6 months of age. Out of 1224 pregnant women, 105 (8.6%; 95% confidence interval, 7.05-10.17) were positive for HCV antibody⁽¹⁾.

Also this is against study in the year 2000, the department of Pediatrics, Faculty of Medicine, Alexandria University, published a study to assess the prevalence of hepatitis C virus (HCV) infection and its vertical transmission in 100 healthy, Egyptian pregnant women who delivered spontaneously at Alexandria University Hospital and their newborns using third generation ELISA test and polymerase chain reaction testing of HCV-RNA (PCR).19% of pregnant women were HCV-seropositive⁽¹⁷⁾, the difference may be due to factors related to residency.

In our study history of operation increase the incidence of HCV and this in agreement with **Tajiri et al.**⁽¹⁸⁾.

Also this is against study in the year 2000, the department of Pediatrics, Faculty of Medicine, Alexandria University⁽¹⁷⁾.

Among babies delivered from HCV -RNA positive women, 2 babies (13.3%) were positive for HCV-Ab and HCV-RNA.

This is in agreement with study in Japan in 2001 conducted over 16,800 pregnant females to estimate the vertical transmission of HCV and risk factors for transmission. All the pregnant females were screened for HCV-Abs, 114 of them were HCV-Abs positive. The HCV-Abs positive mothers and their neonates were followed up for 6 months. Of the 114 infants 9 (7.8%) had detectable HCV-RNA. The transmission rate was not influenced by the mode of delivery either vaginal or caesarean or by the type of feeding. All infected infants were born to mothers who had HCV viremia at the delivery and to those with a high viral load⁽¹⁸⁾.

In our study all women had a history of surgical intervention and were delivered by CS, 3 babies

(75%) had history of blood transfusion, however there is no significant correlation of vertical transmission and parity or BMI.

Conclusion

In view of the results of the current work, the vertical transmission of HCV is not confirmed, further studies together with long term follow up of seropositive mothers and their neonates are recommended. HCV infection doesn't increase the risk of obstetric complications. National health awareness, guidelines, control are the main items of the prophylactic programs against HCV.

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