

## Prevalence and Risk Factors of Hepatitis C Infection in Pregnant Woman

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### Abstract

With the advances in microbial pathogenesis and emergence of novel drugs and techniques, Hepatitis C Virus still remains the threat to infants in infected pregnant women. Enormous efforts have been made for the control of HCV propagation in developed and underdeveloped countries. Here, we summarized the published reports to review the prevalence of HCV in pregnant women. We found, 31.25% and 21.97% HCV infected pregnant women in report of 2010 from Nigeria (Keffi, jos), followed by Egypt (8.57%), Pakistan (Lahore, 7.0%), Democratic Republic of Congo (4.10%), India, and Ethiopia less than 5% (21-34). In most cases, HCV infection in pregnant women was found along with presence of HIV and HBV.

**Keywords:** *Hepatitis; Pregnant Women; Co-Infections; Hepatitis Risk*

### Abbreviations

HCV: Hepatitis C Virus; HIV: Human Immune Deficiency Virus; CI: Co-Infection

### Introduction

Hepatitis C virus (HCV) was identified in 1989 and the mode of transmission is direct contact through blood and possesses a significant threat to human being worldwide [1,2]. HCV belongs to the family flaviviridae, the genome size is positive sense single stranded RNA with a size of 9.6 kb [3]. The virus classification is normally based on genotype (1-6) and large number sub types (represented by small English alphabet suffixed after genotype, e.g. 1b, 3a) and sequence of homology [4]. HCV infections are associated with liver cirrhosis [5].

Approximately 170 million people (3%) of the whole population of the world is infected annually with HCV [6]. A chronic HCV infection is capable of causing life threatening hepatic disease such as hepto cellular carcinoma, kidney failure and death [7]. Frequency of vertical and horizontal transmission mostly depends on diverse environmental and medical conditions [8-11].

HCV propagates in peripheral mononuclear cells, tissues of pancreas, spleen, kidney, skin, and fluid like semen, breast milk, saliva, vaginal secretions, urine, sweat and tears [12]. It was also found out that the virus could easily be transmitted from infected mother to infants [13]. The risky factors that are associated with HCV vertical transmission are separation of placenta at time of delivery, pre-mature membrane rupturing, vaginal bleeding, gestational diabetes mellitus and the quality or state of being mortal [14,15].

The mortality and morbidity rate in pregnant woman is related with other viral infections [16]. A woman co-infected with HIV can be easily transmitted with HCV with a higher rate compared to a non-infected women and an HCV positive woman can transmit approximately 7 - 8% of viral infections to their progeny [17]. In this article, we summarized the HCV infection related to pregnant women, and causes/risks of infections are discussed along with the strategies for minimizing the prevalence of disease.

### Methodology

A search on published reports in the last ten years was performed using Google scholar and NCBI PubMed using key words, "HCV

prevalence” and “HCV infection in pregnant women”. The relevant published papers were studied and data was collected manually into tabular form. The percentage of HCV reactive and non-reactive were shown as in the original articles without manipulation.

## Results and Discussion

A total number of 46118 pregnant women were identified from the extracted data as mentioned in Methodology section (Table 1). The age of these women was varied from 14 - 45. the data was shown in percentage as in the original articles without manipulation. The country wise distribution of HCV infected pregnant women showed the HCV infected pregnant women were found in report of 2010 from Nigeria (Keffi, jos), followed by Egypt (8.57%), Pakistan (Lahore, 7.0%), Democratic Republic of Congo (4.10%), India, and Ethiopia (21-34). It was found out that the prevalence of HCV was associated with multiple risk factors (Table 1). Some of the major risk factors which were founded during the study from published data were multiple sex practicing, horizontal and vertical transfer, blood transfusion, surgery, abortion, tattooing, inanimate objects, combs, razors, tooth brush, barber shops instrument, ear and nose piercing, dental procedures, intra venous drug abusers, body secretions and through vertical and horizontal transmission [21-34]. The major co infections (CI) that mostly associated with HCV in pregnant women were HIV and HBV as previously published. These CIs may be due to risk factors, lack of proper community education and awareness. The HCV can easily be transmitted from person to person through multiple sex partner relationship, homosexuality, intravenous drug abuser, abortion, horizontal and vertical transmission, body products and secretions. The incidence of CIs with HBV was found highest in India, Nigeria keffi and Democratic Republic of Congo, Ethiopia, Nigeria jos (Table 1). There were no evidence of CIs in the countries like Pakistan, USA, British, Egypt, and Iran. The reason for the low CIs in the mentioned countries is not known but it could be speculated that it may be due to proper education and awareness in these countries.

Country (region)	Year	Pregnant women	Age (yr)	Reactive (%)	Non-reactive (%)	Co infection	Risk factors	Ref
British Columbia	2010	22,369	15 - 44	2.47	97.52	-	Occupational status	21
Pakistan (Lahore)	2009	83	24 - 31	10.84	89.15	-	Lack of proper educational and awareness, tattoo and comb shearing	22
India	2016	10000	14 - 32	0.30	99.70	HBV	Intravenous drug abuser, blood transfusion, multiple sexual partner, homosexuality	23
Nigeria (Keffi)	2010	80	40	31.25	68.75	HBV	Homosexuality sexually transmitted disease	24
Egypt (Benha)	2010	1224	16 - 45	8.57	91.42	-	Blood transfusion, association with HCV positive house members	25
Iran (Lorestan)	2007	827	13 - 42	0.24	99.75	-	Horizontal and vertical transmission, body secretion and product	26
India (New Delhi)	2006	8130	21 - 25	1.03	98.96	HBV	Abortion, tattooing, blood transfusion and surgery	27

Sudan	2006	423	27 - 45	0.3	99.7	-	Surgical instrument, needles and blood transfusion	28
Nigeria (Jos)	2006	91	18 - 42	21.97	78.02	HIV	Blood transfusion and surgery	29
Nigeria (Benin City)	2009	269	29 - 35	1.85	98.14	-	Vertical transmission	30
India (Sangareddy)	2016	1381	18 - 45	0.21	99.78	-	Tattooing	31
Pakistan (Multan)	2010	500	16 - 35	7.00	93.00	-	Tattooing, surgery, blood transfusion and multiple injections	32
Ethiopia	2014	385	18 - 40	0.77	99.22	HIV	Abortion, tattooing, nose piercing, multiple sexual practices	33
Democratic Republic of Congo	2015	581	20 - 41	4.10	95.10	HBV	-	34

**Table 1:** Global distribution of HCV infection among pregnant women and the risk factors.

Margolis., *et al.* reported that the common disease of chronic persistence of hepatitis is a major problem to public health [18]. Furthermore, Alain., *et al.* described that the transmission of HCV from infected individuals to healthy one could be easily monitored through modern techniques for the proper treatment of HCV infections [19]. According to US centers for disease control and prevention, the route of transmission of HCV is common with HIV the rate of transmission is highest when infected blood comes in direct contact with an exposed skin [20].

## Conclusions

A search based study was conducted using previously published reports in the last ten years. It was found out that HCV was prevalent in pregnant women with co-infections such as HIV and HBV, which were due to exposure to high risk factors, such as multiple sex practicing, horizontal and vertical transfer, blood transfusion, surgery, abortion, tattooing, inanimate objects, combs, razors, tooth brush, barber shops instrument, ear and nose piercing, dental procedures, intra venous drug abusers, body secretions and through vertical and horizontal transmissions. These infections could be controlled in the community through proper awareness and education.

## Conflict of Interest

The authors declare no conflict of interest.

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