

*Country Data*

## Prevalence of Seroconversion of Hepatitis C Virus among Hemodialysis Patients in Menoufia Governorate, Egypt

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### Abstract

**Introduction:** Hepatitis C virus (HCV) is one of the most common infections among hemodialysis (HD) patients. It continues to be exasperating problem in many HD centers, in spite of strictly following infection and quality control measures.

**Methods:** This is a multi-center retrospective comparative study, carried out in different HD units of Menoufia Governorate, Egypt. Patients who were HCV negative on starting HD were divided into two groups; Group-1 included patients who remained negative for HCV and group-2 included patients who seroconverted to HCV positive status during dialysis. Risk factors for seroconversion were compared between the two groups.

**Results:** Out of the 514 surveyed patients, 259 were negative for HCV and 255 were positive; the prevalence of HCV infection was 49.6%. A total of 303 patients who were HCV negative on starting HD were recruited in the study. Group-1 included 259 patients who remained negative for HCV and group-2 included the 44 patients who seroconverted to HCV positive status during dialysis. Patients in group-2 had significantly longer duration on dialysis compared to group-1 (71.4 versus 33.7 months) and they had stronger family history of HCV infection (20.5% versus 6.4%).

**Conclusion:** There is high prevalence and high seroconversion rate of HCV in surveyed HD units. Following infection control measures and strict supervision of dialysis staff should be emphasized. More studies are needed to evaluate the possible benefits of isolation protocols of HCV patients on regular HD.

**Keywords:** Hemodialysis; Hepatitis C virus Seroconversion; Menoufia Governorate.

*The authors declared no conflict of interest*

### Introduction

End-stage renal disease (ESRD) became a universal public health concern, as the number of ESRD patients requiring renal replacement therapy is growing dramatically [1]. The most frequent blood-borne infections encountered in HD units are HBV, HCV and to lesser extent human immunodeficiency virus infection (HIV) [2]. This results from patients' impaired cellular immunity, exposure to the infection during HD, recurrent blood transfusion, frequent hospitalization and surgical procedures.

The reported prevalence of HCV infection among dialysis patients in Egypt was estimated to be 52.1% [3], in spite of the advanced infection control measures developed mainly to reduce the risk of transmission of blood-borne viruses in the HD population. Many patients who were definitely HCV negative on starting dialysis, become seropositive during the few following months. In this study we aimed to explore the prevalence and risk factors of HCV seroconversion among HD patients in Menoufia governorate, Egypt.

### Methods

A total of 514 patients from different HD units in Menoufia Governorate were included in this study. We collected data through direct interviews concerning epidemiology, risk factors for hepatitis including blood transfusion, surgery, contact with HCV patients as well as frequency and duration of dialysis. All candidates were subjected to full clinical examination and screening for HCV-Ab. Serology result was compared with the serological reports on starting dialysis.

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## Results

All patients were on regular hemodialysis three times per week, each session four hours. There were no isolation facilities for HCV patients in all centers, but some machines were dedicated for HCV patients with no reuse of dialyzer. Chemical disinfection protocol was enforced after each dialysis. The infection control measures were applied in all units. Serology testing for HCV, HBV and HIV was done routinely every three months.

Out of the 514 patients, 259 were negative for HCV and 255 were positive; the prevalence of HCV infection was 49.6%. A total of 303 patients who were HCV negative on starting HD were recruited in the study. Group-1 included 259 patients were negative for HCV infection upon HD initiation and remained negative. Group-2 included 44 patients who were initially negative but seroconverted during hemodialysis treatment. The mean duration after which seroconversion occurred for group-2 was 36.7 months (SD 22.7).

Regarding risk factors for HCV seroconversion, it was found that patients in group-1 had significantly longer duration on hemodialysis (71.4 versus 33.7 months,  $P=0.01$ ) and significantly higher prevalence of personal contact with HCV infected family members (20.5% versus 6.4%,  $P=0.0001$ ). These were the only two variables significantly associated with HCV seroconversion in regression analysis. Other potential risk factors like blood transfusion, history of bilharziasis, surgical operation, dentist visits, receiving dialysis in emergency situations with temporary catheters, vascular access and vaccination against hepatitis B virus were all not significantly different between the two groups.

## Discussion

HCV was first identified in 1989, it is associated with high rates of end-stage liver disease and is one of the most common causes of morbidity and mortality in HD patients [4, 5]. In Menofia governorate, Egypt, there is a high prevalence of HCV infection among HD patients [6]. In this study we found that the principal variables associated with HCV seroconversion were close contact with an infected family member and long exposure to the infection in dialysis units.

A previous studies evaluated the effect of isolating HCV patient in HD units; it showed significant reduction of HCV and HBV seroconversion rates in facilities that isolated infected patients with strict application of

infection control measures [2]. A similar study from Saudi Arabia concluded that isolation of HCV patients, minimizing blood transfusion and strict application of infection control guidelines also help in prevention of HCV transmission among hemodialysis units [147]. In contrast to this concept an old study from Belgium concluded that the strict enforcement of universal precautions fully prevents HCV transmission between HD patients and that isolation of anti-HCV positive patients is not warranted [8]. The Kidney disease improving global outcome (KIDIGO) guidelines did not recommend isolation policy for HCV infected patients nor recommend use of dedicated machines for them [9].

In concordance with our results, DOPPS study showed that high HCV seroconversion was associated with longer time on dialysis. Another recognized risk factor for contracting the infection as shown by Saxena *et al* was the type of vascular access; they found that patients with arterio-venous fistula and synthetic grafts were more liable to HCV infection than those with permanent catheters [10]

Lack of education and poor adherence to infection control guidelines among dialysis staff may contribute to high HCV seroconversion rates in HD units. Good education and training programs and strict supervision are required for dialysis staff in these settings. Although the no isolation policy and dedicated machines for HCV patients are not recommended by KDIGO guidelines, this is still subject to controversy in developing countries with high prevalence of HCV infections. In developing countries with high prevalence of HCV infection, a randomized controlled study is needed to compare between isolation policy and no isolation policy with adherence to infection control guidelines in terms of reducing HCV seroconversion in dialysis units.

## Conclusions

There is a high prevalence and high seroconversion rate of HCV in surveyed hemodialysis units in this study. Following infection control measures and strict supervision of dialysis staff should be emphasized. More studies are needed for possible benefits of isolation protocols of HCV patients on regular HD.

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