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Investigating the Hepatitis E Seroprevalence Rates Among Hemodialysis Patients in Turkey with Pool Analyses Method

Türkiye'deki Hemodiyaliz Hastalarında Hepatit E Seroprevalans Oranlarının Havuz Analizi Yöntemi ile Araştırılması

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Abstract

Objectives: Hepatitis E virus (HEV) is a worldwide public health problem that affects both poor and developed countries. Hemodialysis (HD) patients have been reported to be at risk for HEV infection due to the likelihood of parenteral and/or nosocomial transmission. The goal of this study was to analyze studies on HEV seroprevalence rates among hemodialysis patients and to highlight differences in disease seroprevalence between geographic regions.

Material and Method: Published literature in English and Turkish language (full text articles or detailed abstracts) on HEV seroprevalence among hemodialysis patients from Turkey were elavuated. Google Scholar, Pubmed, the Scopus, ULAKBIM TR Dizin and the Web of Science databases were scanned by using the keywords " hepatitis E virus " or " HEV " and " hemodialysis patient " or " hemodialysis " and " seroprevalence" or "IG G" and "Turkey"or "Turkish". The publications were assessed based on their general frequency, location, region and year.

Results: The published literature on HEV seroprevalence among Turkish hemodialysis patients in both English and Turkish was reviewed. Only 11 articles were found according to the search criteria. Most of the studies (27.27%) were from the Southeast Anatolia Region. There were no studies from the Marmara and Eastern Anatolia regions. The regional seroprevalence of HEV among hemodialysis patients was highest in the Central Anatolia region (23.43%) and in the Southeastern Anatolia region (21.26%), and lowest in the Aegean region (5.95%). No studies were found in the literature search for the Marmara and Eastern Anatolia regions.

Conclusion: The median of HEV seroprevalence rate was found as 17.62% in this study. The studies were limited, and it is necessary to increase the number of publications on HEV seroprevalence in risky groups from our country.

Keywords: HEV, Hepatitis E virüs, hemodialysis

Öz

Amaç: Hepatit E virüsü (HEV), hem yoksul hem de gelişmiş ülkeleri etkileyen dünya çapında bir halk sağlığı sorunudur. Hemodiyaliz (HD) hastalarının parenteral ve/veya hastane kaynaklı bulaşma olasılığı nedeniyle HEV enfeksiyonu riski altında olduğu bildirilmiştir. Bu çalışmanın amacı, hemodiyaliz hastaları arasındaki HEV seroprevalans oranlarına ilişkin çalışmaları analiz etmek ve coğrafi bölgeler arasındaki hastalık seroprevalansındaki farklılıkları vurgulamaktı.

Gereç ve Yöntem: Türkiye'den hemodiyaliz hastalarında HEV seroprevalansı hakkında İngilizce ve Türkçe yayınlanmış literatür (tam metin makaleler veya ayrıntılı özetler) ele alındı. Google Scholar, Pubmed, the Scopus, ULAKBİM TR Dizin ve Web of Science veri tabanları " hepatit E virüsü " veya " HEV " ve " hemodiyaliz hastası " veya " hemodiyaliz " ve " seroprevalans " veya " IG G " ve "Türkiye" veya "Türk" anahtar kelimeleri kullanılarak tarandı. ". Yayınlar genel sıklık, yer, bölge ve yıl bazında değerlendirildi.

Bulgular: Türk hemodiyaliz hastalarında HEV seroprevalansı hakkında hem İngilizce hem de Türkçe yayınlanmış literatür gözden geçirildi. Arama kriterlerine göre sadece 11 makale bulundu. Araştırmaların çoğu (%27,27) Güneydoğu Anadolu Bölgesi'nden yapılmıştır. Marmara ve Doğu Anadolu bölgelerinden herhangi bir çalışma yapılmamıştı. Hemodiyaliz hastalarında bölgesel HEV seroprevalansı en yüksek İç Anadolu bölgesinde (%23.43) ve Güneydoğu Anadolu bölgesinde (%21.26), en düşük ise Ege bölgesinde (%5.95) bulundu. Marmara ve Doğu Anadolu bölgeleri için yapılan literatür taramasında herhangi bir çalışmaya rastlanmadı.

Sonuç: Bu çalışmada HEV seroprevalans oranı ortancası %17,62 olarak bulundu. Çalışmalar sınırlı olup, ülkemizden riskli gruplarda HEV seroprevalansı ile ilgili yayınların arttırılması gerekmektedir.

Anahtar Kelimeler: HEV, Hepatit E virüs, hemodiyaliz

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INTRODUCTION

Hepatitis E virus (HEV) is a small, non-enveloped virus with a single-stranded ribonucleic acid (RNA) genome. It is classified in the Hepevirus genus and the Hepeviridae family. Among the eight different HEV genotypes, HEV1, HEV2, HEV3, HEV4 and the recently reported HEV7 are mainly responsible for human infection.[1,2] HEV is one of the viruses that can cause liver disease and is spread via the fecal-oral or transplacental routes. However, the data obtained in recent years have revealed that the virus is zoonotic, and that parenteral and vertical transmission may even be possible.[3,4] Although rare in developed countries, HEV infection is common in developing countries.[3] HEV is most often caused by insufficient clean water supply and is seen in developing countries with poor environmental cleanliness.[4] HEV infection is a worldwide public health problem that affects both poor and developed countries. World Health Organization has estimated that 20 million HEV infections occur each year in the world, and the HEV infection had caused 44 000 deaths in the year 2015.[5] It is endemic to Asia, the Middle East, Africa, and Central America. HEV outbreaks involving large numbers of people have been reported in several regions.[4] Despite this HEV is still poorly understood, and clinicians routinely overlook this or misdiagnose this infection.[6] In endemic and nonendemic locations across the globe, clinical manifestation, source of infection, and route of exposure differ depending on HEV genotype and epidemiology. The presentation, diagnosis, prognosis, and natural history of HEV infection might be acute or chronic, further confusing the presentation, prognosis, diagnosis, and natural history of illness. Correct identification and diagnosis of HEV, on the other hand, has significant implications for patient care, disease control, preventative efforts, and the characterisation of transmission pathways and epidemiology.[4,6] The previous studies on anti-HEV seropositivity from Turkey indicate that the frequency of HEV infection is increasing.[4] It has been reported that hemodialysis (HD) patients are at risk for HEV due to the possibility of parenteral and/or nosocomial transmission.[7,8]

The goal of this study was to use the pool analysis approach to analyze studies on HEV seroprevalence rates among hemodialysis patients and to highlight differences in disease seroprevalence between geographic regions.

MATERIAL AND METHOD

Published literature in English and Turkish language (full text articles or detailed abstracts) on HEV seroprevalence among hemodialysis patients from Turkey were elavuated.

Google Scholar, Pubmed, the Scopus, ULAKBIM TR Dizin and the Web of Science databases were scanned by using the keywords " hepatitis E virus " or " HEV " and " hemodialysis patient " or " hemodialysis " and " seroprevalence" or "IG G" and "Turkey"or "Turkish".

The articles were assessed based on their general frequency, location, region and year.

The data obtained were analyzed using Statistical Package for the Social Sciences (SPSS) for Windows Version 23.0 software (SPSS Inc., Chicago, IL, USA). Data were reported as mean ± standard deviation values, number, and percentage. Descriptive statistics were used in the statistical evaluation.

To estimate the seroprevalence of HEV among HD patients, the pooled method was used and the simple mapping method for visualization.

Ethics approval: Ethics committee approval is not necessary since the literature research work was used in the research. The study was carried out in accordance with the principles of the 2013 revised Helsinki Declaration.

RESULTS

The published literature on HEV seroprevalence among Turkish hemodialysis patients in both English and Turkish was reviewed. Only 11 articles were found according to the search criteria. Most of the studies (27.27%) were from the Southeast Anatolia Region. There were no studies from the Marmara and Eastern Anatolia regions (**Table 1**).

Table 1. Studies according to geographical regions in Turkey (n=11) (9-19).

Geographical region	n	%
Aegean	2	18.18
Marmara	0	0
Eastern Anatolia	0	0
Central Anatolia	3	27.27
Mediterranean	2	18.18
Black Sea	1	9.09
Southeast Anatolia Region	3	27.27

The regional seroprevalence of HEV among hemodialysis patients was highest in the Central Anatolia region (23.43%) and in the Southeastern Anatolia region (21.26%), and lowest in the Aegean region (5.95%). No studies were found in the literature search for the Marmara and Eastern Anatolia regions (**Figure 1**). The median of HEV seroprevalence rate was found as 17.62% in this study.

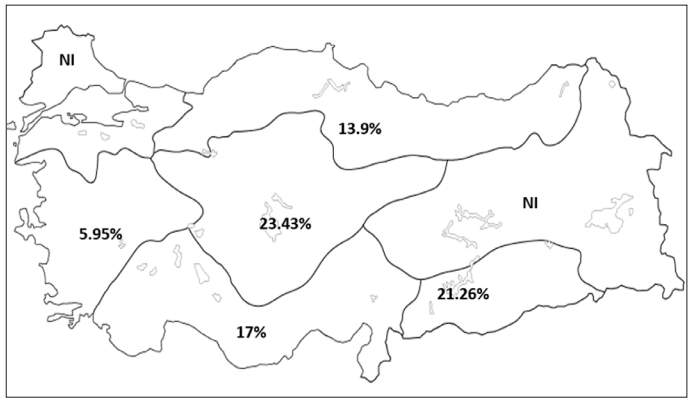

Figure 1. Hepatitis E seroprevalence rates among hemodialysis patients in Turkey.

The most of the publications (63.64%) were published before the 2000s (**Table 2**).

Table 2. Studies according to the publication years (n=11).

Publication year	n	%
1990-2000	7	63.64
2001-2010	2	18.18
After 2011	2	18.18

DISCUSSION

Hepatitis and human immunodeficiency viruses are the most frequent bloodborne viral infections in HD units and the general population, respectively.[7] HEV seroprevelance rates are known to be higher in some risky groups, such as hemodialysis patients. This may be due to many blood changes or invasive procedures. HEV Infection is a growing health concern among these patients. To date, numerous studies have been undertaken around the world to explore the seroprevalence of HEV among hemodialysis patients, however the results are inconsistent.[4,20]

Haffar et al.[21] did a meta-analysis that found a link between HD and HEV seroprevalence. According to their findings, HD patients had a higher seroprevalence of HEV compared to non-HD controls (OR 2.47, 95 percent CI: 1.79-3.40, I2=75.2 percent, P.01). Several risk factors for HEV infection in HD patients have been discovered in another review study by Hosseini-Moghaddam et al.[22] including older age, living in rural vs. urban regions, low education, and HD duration.

Also the limited number of studies were published from Turkey.[4] This study aimed to analyze the HEV seroprevalence rates among hemodialysis patients according to geographic regions.

Although studies have been carried out in different risk groups in various studies, the highest HEV seropositivity rates were found in the Eastern Anatolia Region.[4] But it was found that in this study, most of the studies (27.27%) were from the Southeast Anatolia Region. There were no studies from the Marmara and Eastern Anatolia regions. The regional seroprevalence of HEV among hemodialysis patients was highest in the Central Anatolia region (23.43%) and in the Southeastern Anatolia region (21.26%).

The HEV seroprevalence found in this study is lower (17.62%), than those observed in hemodialysis patients in other countries (68.9 % in Sudan, 39.6 % in Egypt, 36.8 % in England, 30% in Japan; but higher than 10.2 percent in Tunisia (10.2%) and in Italy (6%).[20]

The seroprevalence studies in high-risk populations can assist determine whether the HEV vaccine is needed in our country and, if so, which groups should be immunized. Immunization is an effective and safe method of preventing infectious diseases in general, and HEV infection is no exception. There is presently no the Food and Drug Administration (FDA)-approved HEV vaccine.

CONCLUSION

It is necessary to increase the number of publications on HEV seroprevalence in risky groups from our country.

Limitation: There were limited studies in this study.

ETHICAL DECLARATIONS

Ethics Committee Approval: There is no need as it is a document study.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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