REVIEW ARTICLE

CONTENTS

Epidemiology, treatment and diagnosis of Hepatitis C virus infections

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ABSTRACT

Aim: Studding several aspects of Hepatitis C virus infection, such as epidemiology, prevalence, diagnosis, and outcome of patients with hepatitis C infection.
Materials and Methods: Systematic review of electronic medical records and epidemiological data and risk factors for Hepatitis C virus infection in patients evaluated in relevant studies.
Conclusions: Hepatitis C virus serology and viral genotyping. Hepatitis B may be associated with risk factors such as perinatal infection, kidney disease, dialysis, intravenous or percutaneous drug use, occupational factors, suddenly local population factors of hepatitis transmission and pay children. These young and vulnerable cultures bear the enormous social, economic, and political costs of Hepatitis C virus infection. Therefore, to combat the effects of Hepatitis C at regional and national levels, specific intervention approaches and policies are needed.

KEY WORDS: epidemiology, treatment, diagnosis, Hepatitis C, infections

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ABBREVIATIONS

HCV: Hepatitis C virus
HCC: Hepatocellular Carcinomas
DAAs: Direct-Acting Antiviral Medications
CIAs: Chemiluminescence Assays
NAT: Nucleic Acid Testing
EIAs: Enzyme Immunoassays
ECLs: Electrochemoluminescence Immunoassays
CLIAs: Chemiluminescence Immunoassays
RDTs: Rapid Diagnostic Tests

INTRODUCTION

According to WHO data, about one million new cases of HCV infection are recorded each year, with a 2.2% prevalence. Additionally, patients with HCV are thought to be responsible for 25% of HCC and 27% of cirrhosis globally. This type of infection is very common in poor nations, especially in those groups that were thought to be at hazard of contracting the HCV [1]. Simple population-based disease screening techniques and efficient therapies enable successful interventions to lower the burden of disease and ultimately eradicate viral hepatitis identifies a disabling social problem by 2030. It examines barriers in the 2015, World Health Organization ranking [2]. Chronic HCV infection influences 71.1 million people globally, or 1% (955% CI: 0.8–1.1) of the population, making it a global health issue. Intravenous drug use, hazardous injection procedures in hospitals, and direct blood-to-blood contact through blood transfusions are the most prevalent ways that HCV is transmitted [3]. In 2015, locations were the relative incidence of intercontinental HCV is 23.7 cases per 100,000 people (95% CI 21.3–28.7), or about 1.75 million new infections. There is evidence that about 2.3 million people living with HIV have experienced or are now experiencing HCV harms. HCV genotypes 1(44%) of patients, 3(25%) of patients, and 4 (15%) of patients are responsible for the intercontinental epidemic [4]. Thus, infection has been implicated in HCV pathogenesis, leading to the development of HCV [5]. HIV (human immunodeficiency virus) drug users who freely exchange syringes have seen an increase in HCV infections. When selecting a new therapy technique, several factors need to be considered, including the patient's age, gender, viral genotype, and related disorders. It seems that some preventative interventions are necessary for the high-risk population [6]. Documenting the generality

of HCV ill health in patients, documenting the epidemiology of viral hepatitis in various countries, summarizing pertinent published literature, and estimating the disease's potential burden based on available data were the objectives of the current study. Because this infection's frequency, diagnosis, and treatment should guide future research and aid in infection prevention measures. The majority of HCV infection-related events, including epidemiology, transmission, diagnosis, and patient outcomes, were discussed in this assessment. The citation databases PubMed and Scopus were used to conduct a narrative review search. Hepatitis C epidemiology, transmission, virology, prevalence by itself, and combinations were the keywords. The American Association for the Study of Liver Disease (AASLD) and the European Association for the Study of Liver Disease (EASLD) were also searched [7].

AIM

The aim of this research was to investigate several aspects of HCV infection, such as epidemiology, prevalence, diagnosis and outcomes in patients with hepatitis C infection.

MATERIALS AND METHODS

A recently established procedure for HCV reviews served as the basis for the study's methodology. The main features of this methodology are described below. We conducted a systematic search of PubMed to identify published studies on the prevalence, diagnosis, treatment, and control of HCV in these countries.

REVIEW AND DISCUSSION

GLOBAL EPIDEMIOLOGY OF HCV INFECTIONS

An estimated 71 million people, or 1% of the world's population, were expected to have a chronic HCV infection. However, it was estimated that around 14 million people in the European Union/European Economic Area had a chronic HCV infection, indicating a comparatively higher incidence of 1.5% in this area [10]. An estimated 1.75 million people worldwide were newly infected with HCV in 2015, translating to a global incidence of 23.7 cases per 100,000 people (95% UI: 21.3–28.7). It surpassed the total estimated number of people who died from end-stage HCV infection (N = 399,000) and those who were treated (N = 843,000), which explains why the global epidemic is still spreading [11]. From 1995 to 2006, the government monitored the incidence of HCV in 13 Saudi Arabian administrative provinces. The number of cases reported to the MOH varied significantly by region, with Jizan having the lowest prevalence (0.016%) and Al-Baha and Jeddah having the highest (0.32%) per capita [12]. These findings are consistent with previous KSA investigations. For example, research of 557,815 Saudi citizens in the province of Riyadh revealed a 1.1% anti-HCV prevalence in adults, while blood screening results from 528 blood donors in the Jeddah region showed a 1.7% prevalence of HCV infection [13]. HCV infection seems to be most common in the Middle East and North Africa (MENA) area globally [14]. HCV is a major problem in a few nations in the region, such as Egypt, where the prevalence is 14.7%, and Pakistan, where it is 4.8%.It is yet unclear how widespread the virus is in the nations of the Arabian Gulf [15, 16]. In terms of both population and land area, Saudi Arabia is the biggest nation in the region. Out of the 120 records that contained 442 HCV prevalence measures from this nation, 81 were found in high-risk groups, 32 in intermediate-risk groups, 60 in specific clinical groups, and 269 in general populations [17]. The prevalence of HCV was lower in developed nations like the United States (1.8%), Germany (0.6%), Canada (0.8%), France (1.1%), and Australia (1.1%) than in East Asia or North Africa. HCV prevalences in Indonesia and Pakistan were 2.1% and 6.5%, respectively, while those in China and India, which account for one-fifth of the global population, were 3.2% and 0.9% [18]. According to [19], a study on the prevalence of the HCV in the Iranian population found that just 0.5% of Iranians were infected with the virus, which is low when compared to other neighboring nations like Pakistan (5.1%) as well as caring for the sick.

DIAGNOSTIC TESTS OF HCV

IDENTIFICATION OF ANTI-HCV ANTIBODIES USING SEROLOGICAL TESTING

Detecting HCV infection usually begins with serological testing to find anti-HCV antibodies [20]. Blood antibodies against HCV are usually detected two or three months after virus exposure. Antibody testing for HCV includes chemiluminescence assays (CIAs), enzyme immunoassays (EIAs), and rapid diagnostic tests (RDTs) [21]. Serological assays are frequently used as the first diagnostic technique to check for viral exposure and identify the host immune response (antibodies to HCV) or a viral antigen (HBsAg, HCVcAg) [22]. Hepatitis serological diagnostics based on the immunoassay principle include rapid diagnostic tests (RDTs), laboratory-based enzyme immunoassays (EIAs), and electrochemolumi-

nescence immunoassays (ECLs) and chemiluminescence immunoassays (CLIAs) [23]. Fast throughput, high precision, dependability, and cost-effectiveness are the primary benefits; full automation's technical simplicity for testing facilities suggests a high volume. Rapid diagnostic tests (RDTs) are less expensive than costly tests to use, are readily available, and can use capillary blood, serum, and plasma samples collected from handshakes. In extreme cases, they may also hire trained laypersons or expert demonstrators who do not require equipment using small incisions or venipuncture [24].

MOLECULAR TECHNIQUE FOR SCREENING HCV

An additional layer of blood safety is provided by nucleic acid testing (NAT), a molecular screening method for blood donations that reduces the risk of ITT for recipients. In the case of viral nucleic acids, NAT exhibits high sensitivity and specificity. It amplifies the viral ribonucleic acid (RNA) or deoxyribonucleic acid (DNA) fragments. It reduces the time to infection by detecting HIV, HBV, and HCV earlier than with conventional screening techniques. The use of serological techniques to rectify donations that react improperly is another benefit of NAT, which is essential for donor counseling and information. Targeted NAT technologies help to reduce the window for HIV, HBV, and HCV. It has issues with costly excavation, consumables, infrastructure, and technical know-how, and it is very technical [25]. The frequency and generality of illnesses in the blood donor population, the resources that are available, and the proof of the advantages of using NAT in conjunction with serology testing all affect the necessity for NAT, thus, once the basic transfusion arrangement is complete, including donor withdrawal, donor notification, counseling, and quality-assured sensitive serologic techniques for TTI screening for infectious diseases by transfusion (TTI), included, and the decision to start NAT is considered to have to go [26].

TREATMENT OF CHRONIC HCV

Ribavirin and interferon boosted with polyethylene glycol are used to treat degenerative HCV unhealthiness. Treatment aims to prevent the improvement of cirrhosis and reduce or stop the advancement of fibrosis. It is predicated on indicators of a persistent virological response. In the approaching, a multidrug program might be developed to enhance current treatments. Patients who have a persistent HCV infection should abstain from alcohol. Alcohol consumption is safe for people infected with HCV, despite the lack of a vaccination to prevent infection [27]. Treatments are designed to help patient's live longer, symptom-free lives by preventing the emergence of tuberculosis and delaying or stopping its progression. An objective criterion utilized in the majority of studies to evaluate treatment success is the intervention's long-term results, which are linked to better outcomes, including decreased mortality, readmission risk, and risk of cirrhosis and breast cancer. The decision to continue treatment may be influenced by a number of circumstances, even if the objective is to treat people with chronic HCV infection [28]. A decreased likelihood of responding to treatment is linked to non-modifiable variables, including the degree of liver fibrosis, obesity, advanced age, Black or Latino race, high viral load, and genotype 1. People who are at least eighteen years old, willing to receive treatment, Treatment candidates for HCV infection typically include those who adhere to treatment guidelines, have compensatory cirrhosis or severe liver fibrosis, have abnormal serum alanine transaminase (ALT) values, have normal renal function, and are free of anemia or neutropenia. Baseline blood work should be performed before starting interferon therapy because it has been associated with autoimmune thyroiditis, thrombocytopenia, and leukopenia. This includes assessment of thyroid-stimulating hormone levels, a comprehensive metabolic panel, and a complete blood count. For patients with autoimmune hepatitis, decompensated cirrhosis, ongoing HCV infection and anemia, severe heart disease, untreated severe depression, and renal insufficiency, treatment is not suggested for pregnancy or untreated hyperthyroidism. Since ribavirin (Rebetol) is eliminated by the kidneys and should be administered with caution in patients with renal impairment, blood urea nitrogen and serum creatinine levels should be monitored. More interferons (Albinterferon alfa-2b and consensus interferon) and ribavirin alternatives (taribavirin) are being developed to improve the safety, efficacy, and tolerance of treatment for chronic HCV infection [29]. Phase 3 clinical trials are currently being conducted to examine two novel protease inhibitors: boceprevir and telaprevir multidrug regimens will most likely be utilized in conjunction with ribavirin and interferon in the future [30, 31].

CONCLUSION

HCV treatment as a preventative measure will be a successful means of lowering the burden of Disease linked to HCV in the future as efficient IFN-free DAA regimens become more widely accessible. The current framework for PWID care and prevention must be expanded upon in any approach. Treating HCV as a prophylactic approach is only one aspect of the problem; another is

increasing access to HCV testing and care. A comprehensive approach combining population-based and individual-level strategies will be required to control and ultimately eradicate HCV transmission and illness. To ascertain the best way to distribute services, cost-effectiveness analyses are required.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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