A REVIEW ON HEPATITIS VIRUS-INFECTED COWS MAY EXHIBIT A VARIETY OF CLINICAL SYMPTOMS, SUCH AS DECREASED MILK OUTPUT

Article *in* Life Science Archives · August 2023

DOI: 10.22192/lsa.2023.9.3.3

CITATIONS
0

READS
88

7 authors, including:

Noor Abady
Al-Qasim Green University
25 PUBLICATIONS **24** CITATIONS

SEE PROFILE

Ahmed Hamzah Mosa
Al-Qasim Green University
16 PUBLICATIONS **20** CITATIONS

SEE PROFILE

Available online at www.jpsscientificpublications.com

Life Science Archives (LSA)

ISSN: 2454-1354

Volume – 9; Issue - 3; Year – 2023; Page: 2682 – 2686

DOI: 10.22192/lsa.2023.9.3.3

Review Article

A REVIEW ON HEPATITIS VIRUS-INFECTED COWS MAY EXHIBIT A VARIETY OF CLINICAL SYMPTOMS, SUCH AS DECREASED MILK OUTPUT

Noor Abady[1], Hamed AH Al-jabory[2], Abdul Kareem Salman[1], Lamees Abdul-Razzaq Abdul-Lateef[3] and Ahmed Hamzah Mosa[2]

[1,3]Department of Microbiology, College of Veterinary Medicine, Al-Qasim Green University, Babylon, Iraq
[2]Department of Internal and Preventive Veterinary Medicine, College of Veterinary Medicine, Al-Qasim Green University, Babylon, Iraq
[3]Department of Microbiology, College of Medicine, Babylon University, Babylon, Iraq

Abstract

It is important to note that ruminants, including cows, can be susceptible to other types of viral hepatitis, such as Bovine Viral Diarrhea Virus (BVDV) or other pathogens that affect the liver. These infections have different causes, clinical presentations, and management strategies compared to HCV in humans. The studies have been conducted to investigate the susceptibility of cows and other ruminants to HCV infection, these animals are generally considered resistant or highly resistant to HCV. The specific receptors and cellular factors required for HCV entry and replication are not present or functional in ruminant liver cells. Therefore, even if a cow were exposed to HCV, it is unlikely to become infected or develop clinical disease associated with HCV. Hepatitis C (HCV) is primarily a human viral infection and does not naturally infect cows or other ruminant species. HCV belongs to the Flaviviridae family, specifically the Hepacivirus genus. It is highly adapted to human liver cells and exhibits a complex life cycle specific to humans.

Article History

Received: 28.02.2023
Revised : 17.03.2023
Accepted: 30.03.2023

Key words: HCV, Bovine Viral Diarrhea Virus and Viral Diarrhea.

1. Introduction

Bovine Hepatitis C Virus (HCV): HCV primarily infects humans and is a major cause of chronic liver disease in humans. While HCV has not been identified in cows, bovine viral sequences closely related to HCV have been discovered. However, the clinical significance of these bovine HCV-like viruses in cattle remains uncertain, and further research is needed to better understand their impact (Debing *et al.*, 2016). It is important to note that hepatitis viruses in cows can have significant economic consequences for the livestock industry due to reduced productivity, increased morbidity and mortality, and reproductive issues. Prevention and control measures for hepatitis viruses in cows typically involve vaccination, biosecurity protocols, and

***Corresponding author**: Noor Abady
E.mail: noorabady@vet.uoqasim.edu.iq

testing to identify and remove infected animals from the herd. Hepatitis viruses in cows can indeed have significant economic consequences for the livestock industry. Here are some key reasons. Reduced Productivity: Cows infected with hepatitis viruses may experience a range of clinical signs, such as reduced milk production, poor weight gain, decreased fertility, and reproductive disorders. These factors can lead to decreased productivity in terms of milk yield, meat production, and overall herd performance (Kamar *et al.*, 2012).

2. Morbidity and Mortality: Hepatitis viruses

The immune system of infected cows, making them more susceptible to other diseases and infections. This can result in increased morbidity and mortality rates within the affected herd. Sick cows require veterinary attention and medical treatments, which can lead to additional costs for the farmers.

Disease Transmission

Some hepatitis viruses, like Bovine Viral Diarrhea Virus (BVDV), can be easily transmitted from infected cows to healthy animals. This means that an outbreak within a herd can spread rapidly, affecting multiple animals and potentially the entire cattle population. Controlling the spread of hepatitis viruses requires strict biosecurity measures and management practices, which can incur additional expenses (Slot *et al.*, 2013). Trade

Restrictions

In cases where a herd is infected with hepatitis viruses, trade restrictions may be imposed on cattle movement to prevent the spread of the disease to other regions or countries. These restrictions can have a significant impact on the livestock industry, as it limits the ability to sell or transport cattle, resulting in financial losses for the farmers and affecting the overall market.

Vaccination and Testing Costs

Implementing preventive measures against hepatitis viruses, such as vaccination programs and routine testing, requires additional investment (Hoofnagle *et al.*, 2012). Vaccines and diagnostic tests for hepatitis viruses can add to the operational costs of cattle farms. However, these measures are crucial in preventing and controlling the spread of the viruses and minimizing economic losses in the long run.

Given these economic consequences, it is important for cattle farmers to prioritize disease prevention, early detection, and appropriate management practices to mitigate the impact of hepatitis viruses on their herds and the industry as a whole.

Hepatitis C Virus (HCV) itself has not been definitively identified in cows. However, there have been studies where bovine viral sequences closely related to HCV have been discovered. These viral sequences are known as bovine HCV-like viruses. The term "bovine HCV-like viruses" refers to viral sequences found in cows that share genetic similarities with HCV. While these bovine viruses are closely related to HCV, they are not the exact same virus (Feagins *et al.*, 2008). The significance and implications of these bovine HCV-like viruses in cattle health and their potential to cause hepatitis in cows are still not fully understood. It's important to note that the discovery of bovine HCV-like viruses highlights the potential for cross-species transmission and the existence of related viral strains in different animal species. However, further research is needed to determine the clinical significance, transmission dynamics, and impact of these bovine HCV-like viruses on cattle health and their relevance to human health (Shu *et al.*, 2014).

Overall, hepatitis viruses in cows, such as BVDV, bovine HEV, and bovine HCV-like viruses, can cause diseases and impact cattle health. Ongoing research is crucial to better understand the prevalence, transmission and clinical significance of these viruses in cows, which can aid in the development of effective control strategies (Johne *et al.*, 2016).

3. Bovine Viral Diarrhea Virus (BVDV) and Hepatitis C

Bovine Viral Diarrhea Virus (BVDV) is a viral infection that primarily affects cattle. It is a member of the Pestivirus genus, which also includes other viruses like Border Disease Virus (BDV) and Classical Swine Fever Virus (CSFV). BVDV can cause a wide range of clinical manifestations in cattle, including diarrhea, respiratory symptoms, reproductive disorders, and immunosuppression. Persistently infected (PI) animals, which are born with the virus and can spread it throughout their lives, play a significant role in the transmission and maintenance of the virus within herds. BVDV can have a significant economic impact on the cattle industry due to decreased reproductive performance, reduced growth rates, and increased susceptibility to other infections. Vaccination and biosecurity measures are key strategies for preventing and controlling BVDV in cattle populations (Scobie and Dalton, 2013).

Hepatitis C, on the other hand, is a viral infection that affects humans. It is caused by the Hepatitis C virus (HCV), which primarily targets the liver. Hepatitis C is transmitted through contact with infected blood, most commonly through sharing needles among people who use illicit drugs or through unsafe medical practices. In some cases, the virus can also be transmitted sexually or from mother to child during childbirth. Hepatitis C can lead to acute or chronic liver disease, with symptoms ranging from mild illness to severe liver damage, cirrhosis, and an increased risk of liver cancer. Antiviral medications are available to treat Hepatitis C and can cure the infection in the majority of cases. Prevention measures for Hepatitis C include screening blood donations, implementing universal precautions in healthcare settings, promoting safe injection practices, and raising awareness about the risks associated with certain behaviors. While both BVDV and Hepatitis C are viral infections that affect the liver, they are caused by different viruses and primarily impact different species (cattle for BVDV and humans for Hepatitis C). It is important to differentiate between the two when discussing their characteristics, transmission, and management strategies (Debing *et al.*, 2016).

4. Pasteurized milk infected with Hepatitis E Virus

There is some evidence to suggest that Hepatitis E Virus (Sabat *et al.*, 2013) can be transmitted through consumption of contaminated milk, both raw and pasteurized. However, it's important to note that the risk of HEV transmission through milk is generally considered to be low, and most cases of HEV infection are associated with the consumption of undercooked or raw pork products or contaminated water (Sabat *et al.*, 2013). HEV is primarily transmitted through the fecal-oral route, meaning that the virus is shed in the feces of infected individuals or animals and can contaminate the environment or food and water sources (Lee *et al.*, 2016). In the case of milk, if an infected cow sheds the virus in its feces, there is a possibility of contamination of the milk during the milking process. Pasteurization, a process that involves heating milk to a specific temperature to kill pathogens, including HEV, is highly effective in reducing the risk of transmission of many infectious agents, including HEV. Proper pasteurization destroys HEV present in milk, ensuring its safety for consumption (Johne *et al.*, 2014). However, it's important to ensure that pasteurization is done correctly according to established guidelines. Raw or unpasteurized milk, on the other hand, has the potential to carry various pathogens, including HEV, if the milk comes from an infected animal. Consuming raw milk can pose health risks as it bypasses the safety measures provided by pasteurization. Therefore, health authorities often recommend the consumption of pasteurized milk as a safer option.

To minimize the risk of HEV transmission, it's advisable to follow good hygiene practices, such as washing hands before handling food and practicing proper food handling and preparation techniques. Additionally, consumers should ensure that milk and other dairy products they consume come from reputable sources and are properly pasteurized (Lee *et al.*, 2016).

In summary, HCV is not a natural infection in cows or ruminant species. It is a human-specific virus that primarily affects human liver cells. When discussing HCV in the context of cows or ruminants, it is important to recognize that the virus does not have a significant impact on these animals, and they are not considered a reservoir or source of HCV infection.

5. Reference

1) Debing, Y., Moradpour, D., Neyts, J. & Gouttenoire, J. 2016. Update On Hepatitis E Virology: Implications For Clinical Practice. *Journal Of Hepatology,* 65, 200-212.
2) Feagins, A., Opriessnig, T., Huang, Y., Halbur, P. & Meng, X. 2008. Cross-Species Infection Of Specific-Pathogen-Free Pigs By A Genotype 4 Strain Of Human Hepatitis E Virus. *Journal Of Medical Virology,* 80, 1379-1386.
3) Hoofnagle, J. H., Nelson, K. E. & Purcell, R. H. 2012. Hepatitis E. *New England Journal Of Medicine,* 367, 1237-1244.
4) Johne, R., Reetz, J., Ulrich, R., Machnowska, P., Sachsenröder, J., Nickel, P. & Hofmann, J. 2014. An Orf 1-Rearranged Hepatitis E Virus Derived From A Chronically Infected Patient Efficiently Replicates In Cell Culture. *Journal Of Viral Hepatitis,* 21, 447-456.
5) Johne, R., Trojnar, E., Filter, M. & Hofmann, J. 2016. Thermal Stability Of Hepatitis E Virus As Estimated By A Cell Culture Method. *Applied And Environmental Microbiology,* 82, 4225-4231.
6) Kamar, N., Bendall, R. & Legrand-Abravanel, F. 2012. Hepatitis E (Vol 379, Pg 2447, 2012). *Lancet,* 380, 730-730.
7) Lee, G.-H., Tan, B.-H., Teo, E. C.-Y., Lim, S.-G., Dan, Y.-Y., Wee, A., Aw, P. P. K., Zhu, Y., Hibberd, M. L. & Tan, C.-K. 2016. Chronic Infection With Camelid Hepatitis E Virus In A Liver Transplant Recipient Who Regularly Consumes Camel Meat And Milk. *Gastroenterology,* 150, 355-357. E3.
8) Sabat, A., Budimir, A., Nashev, D., Sá-Leão, R., Van Dijl, J., Laurent, F., Grundmann, H., Friedrich, A. & Markers, E. S. G. O. E. 2013. Overview Of Molecular Typing Methods For Outbreak Detection And Epidemiological Surveillance. *Eurosurveillance,* 18, 20380.
9) Scobie, L. & Dalton, H. 2013. Hepatitis E: Source And Route Of Infection, Clinical Manifestations And New Developments. *Journal Of Viral Hepatitis,* 20, 1-11.
10) Shu, X., Duan, X., Song, C., Li, J., Jiang, L., Yin, G. & Li, W. 2014. Genetic Heterogeneity Of Swine Hepatitis E Virus Isolates From Yunnan Province, China In 2011–2012. *Virology Journal,* 11, 1-7.
11) Slot, E., Hogema, B., Riezebos-Brilman, A., Kok, T., Molier, M. & Zaaijer, H. 2013. Silent Hepatitis E Virus Infection In Dutch Blood Donors, 2011 To 2012. *Eurosurveillance,* 18, 20550.

Access this Article in Online

Quick Response Code	
Website	www.jpsscientificpublications.com
DOI Number	DOI: 10.22192/lsa.2023.9.3.3
Thomson Reuters Researcher ID	L – 5547 – 2016
ISI Impact Factor	4.206

How to Cite this Article:

Noor Abady, Hamed AH Al-jabory, Abdul Kareem Salman, Lamees Abdul-Razzaq Abdul-Lateef and Ahmed Hamzah Mosa. (2023). A Review on Hepatitis Virus-Infected Cows may exhibit a Variety of Clinical Symptoms, such as Decreased Milk Output. *Life Science Archives*, 9(3): 2682 – 2686.

DOI: 10.22192/lsa.2023.9.3.3