

Quick Recovery of Fulminant Hepatitis E Virus (HEV) Infection in Few Days with Excessive Intake of Plum Juice During Last Trimester of Pregnancy

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ABSTRACT

Hepatitis E virus (HEV) is the cause of acute viral hepatitis and fulminant hepatic failure. HEV has huge global bioburden which accounts for 70,000 deaths and 20 million infections per year. HEV during third trimester of pregnancy causes maternal death, fulminant hepatitis, and death of fetus in some cases. Existing literature suggest 33% prevalence of vertical transmission among females infected with HEV during third trimester of their pregnancy. This case-study presents an unusual quick recovery of fulminant HEV in a pregnant female with no medication and excessive intake of plum juice during third trimester followed by normal delivery of health child. Further studies should be conducted to understand the effects of plum juice on liver function and its metabolism.

Keyword: fulminant HEV, Pakistan, treatment, pregnant

INTRODUCTION

Hepatitis E virus is a spherical and non-enveloped virus with 7.2 kilo bases long genome that exists in the form of single stranded positive-sense RNA genome. It belongs to family *Herpesviridae*. Four major genotypes of HEV have been detected in humans. The most common route of transmission of HEV is water or food contaminated with faeces [1]. Prevalence of HEV is quite high in developing countries especially those located in Southeast Asian region because of poor hygienic conditions. Pakistan experienced as ever outbreak of HEV during the first of 2019. On April 26th, 2019, more than 300 people were found HEV positive in Lahore.

HEV in pregnancy has been reported to cause maternal and fetal morbidity and mortality following fulminant hepatitis and liver complications. The reported frequency of vertical transmission is 50% [2]. The immunologic and hormonal changes during pregnancy favors viral replication [3]. This case-report presents laboratory and clinical findings of pregnant female infected with HEV during the last trimester of her pregnancy who later exhibited successful management in just few days of with excessive fluid intake and other supportive measures. This study provides the first evidence of health benefits of plum juice in liver functioning.

CASE PRESENTATION

On May 23rd 2019, a 29-years old, eight months pregnant female was brought to hospital following severe jaundice, malaise, nausea, vomiting, and abdominal pain. She has no past medical history and acquired the infection during an HEV outbreak that occurred in the city in April, 2019. The liver function enzymes noted on the day of admission were significantly raised. Liver function tests showed AST2471IU/ml, ALT862IU/ml, ALP136, and total bilirubin 5.8g/dL. The patient was prescribed with hepamerz and fluid intake on the first day of admission (May23rd) but the liver function tests kept on increasing until 1st, June. The patient stopped taking hepamerz and started excessive fluid intake of plum juice and tamarind. The liver function enzymes turned completely normal during the week when patient changed her eating habits and added excessive intake of plums and tamarind in fluid form. In contrast to previously reported findings, patient delivered normal health female child, HEV cleared in few days, and LFTs level decreased to normal range without taking any specific medication and following hygienic lifestyle. Upon interview, the patients shared her experience of health benefits she gained from prune/plum juice. Figure 1 shows that liver function enzymes elevated to an abnormally high figures during the second week of infection whereas, the laboratory investigation showed normal

LFTs during the third week when patient reportedly increase the intake of prune and tamarind in fluid form.

The patient delivered healthy neonate with no anomalies 4 weeks after recovery from infection and LFTs and HEV PCR of both the mother and child were found normal during the follow-up visit.

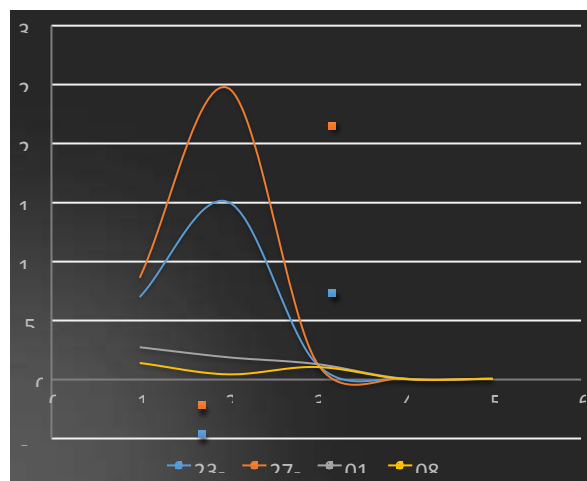


Figure 1: Liver function enzymes of patient showing a very high elevation during the second week of infection. Patient reported increased uptake of plum juice during third week of infection that later lowered the LFTs to normal range.

DISCUSSION

This case-study is unusual because existing literature suggest that HEV in pregnant women is associated with hepatic failure, still births, preterm delivery, and maternal death in many cases [3-7]. Whereas, we observed that HEV infected pregnant female diagnosed with fulminant hepatitis, a very high viral titre, and highly elevated LFTs in the last trimester for pregnancy recovered in few days and delivered normal neonate.

The patient herself was a researcher and reported the health benefits she gained by using prune/plum/tamarind juices regularly. Previous studies have already proven the role of fruits and vegetable juices in the treatment of cardiovascular diseases by controlling blood pressure and improving the blood lipid profiles [8]. Another study by Noratto et al., investigated the role of polyphenol-rich peach and plum juices against cardiovascular and obesity-

related disorders in Zucker rats and found out that peach and plum juice provided protection against obesity related problems such as leptin and insulin resistance, dyslipidemia, low-density lipoprotein oxidation, hyperglycemia [9]. Furthermore, another study also proved that dried plums and their products can control obesity, diabetes, and heart disorders. Likewise, Henning et al., reported that 3 days long regular intake of juice decrease oxidation of lipid, cause weight loss, and improve digestion [10]. A clinical trial published in 2010 also reported decrease in LFTs in hepatitis patients following regular intake of prune (dried form of plum) [11]. This case-study provides another evidence of efficacy of plum juice in hepatitis and its role in normalizing liver function enzymes.

CONCLUSION

HEV in pregnant women has been reported to cause preterm delivery or fetal death in majority of cases. Patients are suggested to take ribavirin for a month with supportive measures like hygienic eating and the use of clean water because the virus spreads through oral-fecal route. Management of HEV in pregnancy is quite challenging. Ribavirin therapy in pregnant women is not recommended because of reported teratogenic outcome of ribavirin and HEV if left untreated can be vertically transmitted. This study also highlights the need to conduct future research on the effects of plum juice on liver.

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REFERENCES

1. Kamar, N., et al., Hepatitis E virus infection. *Clinical microbiology reviews*, 2014. 27(1): p. 116-138.
2. Salman, M., Z.M. Ul, and N. Asif, Hepatitis E outbreak in the province of Punjab, Pakistan: a call for action. *Infectious diseases (London, England)*, 2019. 51(8): p. 633-634.
3. Chaudhry, S.A., N. Verma, and G. Koren, Hepatitis E infection during pregnancy. *Canadian Family Physician*, 2015. 61(7): p. 607-608.
4. Paskaran, P., et al., A case report of hepatitis E infection leading to acute liver failure and transplantation. *Clinical Medicine: Case Reports*, 2008. 1: p. CCRRep.S845.
5. Kumar, N., et al., Fetomaternal outcomes in pregnant women with hepatitis E infection; still an important fetomaternal killer with an unresolved mystery of increased virulence in pregnancy. *Turkish journal of obstetrics and gynecology*, 2017. 14(2): p. 106.
6. Goumba, C.M., E.R. Yandoko-Nakouné, and N.P. Kompa, A fatal case of acute hepatitis E among pregnant women, Central African Republic. *BMC research notes*, 2010. 3(1): p. 103.
7. Chandnani, M., et al., A case report about the most common yet most forgotten hepatitis E. *The American journal of case reports*, 2016. 17: p. 584.
8. Zheng, J., et al., Effects and mechanisms of fruit and vegetable juices on cardiovascular diseases. *International journal of molecular sciences*, 2017. 18(3): p. 555.
9. Noratto, G., et al., Consumption of polyphenol-rich peach and plum juice prevents risk factors for obesity-related metabolic disorders and cardiovascular disease in Zucker rats. *The Journal of nutritional biochemistry*, 2015. 26(6): p. 633-641.
10. Henning, S.M., et al., Health benefit of vegetable/fruit juice-based diet: Role of microbiome. *Scientific reports*, 2017. 7(1): p. 1-9.
11. Ahmed, T., et al., Report: prunes and liver function: a clinical trial. *Pakistan journal of pharmaceutical sciences*, 2010. 23(4): p. 463-466.