

# Epidemiological characteristics and clinical features of sporadic viral hepatitis E (HEV)

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**Abstract:** The study aims to analyze the epidemiological characteristics and clinical features of sporadic viral hepatitis E. The 1,000 cases of sporadic viral hepatitis E patients treated in 20 hospitals from May 2013 to May 2016 were selected as research subjects, with their clinical data retrospectively analyzed. (1) Epidemiological characteristics: Seen from the disease time, the 1,000 patients have morbidity throughout the year, but morbidity in hot and rainy summer is significantly higher than other seasons, there exists statistically difference in comparison between the groups ( $P < 0.05$ ); sporadic viral hepatitis E has no family aggregation; male morbidity is greater than female. In the study, there were male 782 cases, 218 female cases, with male /female ratio at 3.6: 1; morbidity was 13.7% (137/1000) for patients under 18, 62.9% (629/1000) for patients aged 18-60, 23.4% (234/1000) for patients over 60; there were 692 cases of simplex hepatitis E (simplex infection), 308 cases of hepatitis E complicated with chronic liver disease (super infection), of which, complicated viral hepatitis B took up the majority. (2) Clinical features: In the early stage, patients had symptoms of fever, stuffy nose, sore throat; 784 (78.4%) patients had jaundice during illness; 527 (52.7%) patients had loss of appetite, nausea and other gastrointestinal symptoms; ALT, AST of patients with hepatitis E plus posthepatic cirrhosis were significantly lower than patients with simplex infection (all  $P < 0.01$ ); total bilirubin in patients over 60 was significantly higher than that of young and middle-aged patients, statistical difference in statistical analysis was ( $P < 0.05$ ); in the study, 274(27.4%) patients had complications, complication probability of patients aged over 60 was higher than young and middle-aged patients, difference comparison was statistically significant ( $P < 0.05$ ); complication probability of super infected patients was higher than those with simplex infection ( $P < 0.01$ ). All the patients underwent liver protection, jaundice removal and other symptomatic treatments, achieving good treatment effect: 315 cases were cured, 678 cases had improved condition, 7 cases died. There exists obvious correlation between morbidity of sporadic viral hepatitis E and season, gender and age; once sicken, one needs to take early symptomatic treatment, to avoid more severe damage to liver function.

**Keywords:** Sporadic viral hepatitis E, epidemiological characteristics, clinical features.

## INTRODUCTION

Sporadic viral hepatitis E is mainly observed in some developing countries in Asia and Africa. In general, developed countries feature sporadic cases, while developing countries feature epidemic cases (Haidar *et al.*, 2016; Hashem *et al.*, 2016; Gao *et al.*, 2016; Liu and Liu, 2010).

Data analysis results show that transmission of sporadic hepatitis E mainly has four routes: (1) Food contamination factors leading to outbreak of the disease. Some clinical study results indicate outbreak of viral hepatitis E caused by food contamination. (2) Mainly through fecal - oral dissemination channel, transmission is largely due to water source pollution by fecal, incidence peak mainly occurs in rainy seasons or after flooding, with pandemic scale depending on degree of water source pollution. (3) Transmission via normal life contact. (4) Transmission via transfusion channel. Research shows that by venous inflow of blood or plasma containing HEV, recipient will also have HEV infection (Huang *et al.*, 2009; Cui *et al.*, 2015; Ameen *et al.*, 2016).

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The results show that sporadic viral hepatitis E generally needs comprehensive measures like cutting off route of transmission to achieve effective disease prevention, which is the same as hepatitis A (El Serehy *et al.*, 2015). In addition, to prevent more severe damage to liver function, patients need early diagnosis and symptomatic treatment, so it is quite necessary to study epidemiological characteristics and clinical features of sporadic viral hepatitis E (He *et al.*, 2001). In this paper, a retrospective analysis is done on clinical data of 1000 patients with sporadic viral hepatitis E, with the specific circumstances described below.

## MATERIALS AND METHODS

The research objects are 1,000 patients with sporadic viral hepatitis E who were treated in 20 hospitals from May 2013 to May 2016; all the patients underwent clinical examination and diagnosis in line with "Prevention and Treatment Program for Viral Hepatitis", and were diagnosed with sporadic viral hepatitis E (Chen *et al.*, 2013; Cao *et al.*, 2016; Tibpromma *et al.*, 2016). General information and clinical data of all patients are highly complete with retrospective analysis value. To ensure

result accuracy, patients complicated with other serious diseases, other liver diseases and not voluntarily willing to participate in investigations were excluded in the study.

A retrospective analysis was done on clinical data of the 1,000 patients, including such epidemiological characteristics as gender, age, disease time, as well as type, symptoms and signs, complications, laboratory tests (ALT, AST, total bilirubin, serum albumin, prothrombin time), outcome, etc.

In the study on epidemiological characteristics and clinical features of sporadic viral hepatitis E, SPSS19.0 statistical software was employed for relevant data analysis and processing. Count data was expressed by (n, %), to be tested by chi-square, measurement data was expressed by ( $\bar{x} \pm s$ ), to be tested by t. Only when  $P < 0.05$  is met, difference is deemed to be statistically significant.

## RESULTS

Seen from gender, male morbidity is higher than female. In the study of 1,000 patients, there were 782 male cases, 218 female cases. With male /female ratio at 3.6: 1, gender difference is statistically significant ( $P < 0.05$ ).

Seen from age, the youngest patient in this study was 5 years old, the oldest was 83 years, with average age at ( $43.5 \pm 6.4$ ) years; morbidity of non-elderly patients was 76.6% (766/1000): 13.7% (137/1000) for patients under 18, 62.9% (629/1000) for patients aged 18-60; morbidity of elderly patients (aged 60 and over) was 23.4% (234 / 1000); so, there exists big differences between morbidity of non-elderly patients and elderly patients, morbidity of young and middle-aged patients is significantly higher than other age groups. Comparison between groups  $P < 0.05$ , with statistics significance.

Seen from disease time, the 1,000 patients have morbidity throughout the year, but 65.5% (655/1000) in hot and rainy summer season, while totally 34.5% (345 / 1000) in spring, fall, winter, showing that morbidity in summer is significantly higher than other seasons. There is statistical significance in comparison between groups ( $P < 0.05$ ).

Sporadic viral hepatitis E has no family aggregation; according to analysis result of general data, 1 week to 2 months before the onset, the 1,000 patients had long-standing history of eating out and eating seafood; the shortest period from the onset to hospitalization was 3 days, the longest was 34 days, with average hospitalization period at ( $5.6 \pm 1.3$ ) days.

In the investigated 1,000 patients, there were 692 cases of simplex hepatitis E (simple infection); 308 cases of hepatitis E complicated with chronic liver disease (super infection), of which, complicated viral hepatitis B took up

the majority. Specifically, there were 13 cases complicated with viral hepatitis A, 248 cases complicated with viral hepatitis B (hepatitis B), 42 cases complicated with hepatitis E and posthepatitic cirrhosis, 5 cases complicated with viral hepatitis C; for the 692 patients diagnosed with simplex infection, there were 28 patients with severe hepatitis (4.04%); among the 308 super infected cases, 17.86% (55/308) had severe hepatitis; hence, severe hepatitis morbidity of super infected patients is significantly higher than those with simplex infection. Comparison between groups is  $P < 0.05$ , statistically significant.

Compared with simplex infection, ALT, AST of hepatitis E complicated with posthepatitic cirrhosis were significantly lower (all  $P < 0.01$ ); total bilirubin in patients over 60 years of age was significantly higher than that of young and middle-aged patients. Statistics analysis was with statistical difference ( $P < 0.05$ ).

**Table 1:** The Statistical analysis of symptoms and signs in patients

Symptom	Number of Case	Occurrence Rate
Jaundice	784	78.4%
Anorexia and nausea	527	52.7%
Emesis	376	37.6%
Abdominal distension	348	34.8%
Emesis by oil	233	23.3%
Right upper abdomen discomfort	92	9.2%
Gum discomfort	72	7.2%
Skin itch	45	4.5%
Double leg edema	25	2.5%
Hepatomegaly	112	11.2%
Splenomegaly	107	10.7%
Hepatalgia	41	4.1%
Liver ascites	72	7.2%

In the early stage, patients had symptoms of fever, stuffy nose, sore throat, etc.; 784 (78.4%) patients had jaundice during illness; 527 (52.7%) patients had loss of appetite and nausea; 376 (37.6%) patients had vomiting; 348 (34.8%) patients had abdominal distension; 233(23.3%) patients had oil tiredness; 92(9.2%) patients had right upper abdominal discomfort; 72 (7.2%) patients had gum discomfort; 45(4.5%) patients had skin itchiness; 25(2.5%) patients had lower extremity edema; 112(11.2%) patients had hepatomegaly; 107 (10.7%) patients had splenomegaly; 41 (4.1%) patients had liver percussion pain; 72(7.2%) patients had liver ascites. The Statistical analysis of symptoms and signs in patients is shown as table 1 (Note: There was overlapping of various disease symptoms).

In this group 274 patients who were all middle-young and elderly patients, accounting for 27.4%, suffered

**Table 2:** Risk of developing complication between elderly patient and middle-young patient (n,%)

Type of complication	Number of middle-young patient (n=629)	Number of elderly patient (n=234)	P
Biliary complication	12(1.91)	21(8.97)	<0.05
Electrolyte disturbance	9(1.43)	18(7.69)	<0.05
Pulmonary infection	14(2.22)	27(11.54)	<0.05
Upper gastrointestinal hemorrhage	17(2.70)	25(10.68)	<0.05
Urinary tract infection	10(1.59)	22(9.40)	<0.05
Hepatic encephalopathy	13(2.07)	24(10.26)	<0.05
Spontaneous peritonitis	11(1.75)	19(8.12)	<0.05
Hepatorenal syndrome	11(1.79)	21(8.97)	<0.05

complications including biliary complication, electrolyte disturbance, pulmonary infection, upper gastrointestinal hemorrhage, urinary tract infection, hepatic encephalopathy, spontaneous peritonitis, hepatorenal syndrome; Patients aged over 60 suffered a higher risk of developing complications than middle-young patients did, and the difference were of statistic significance ( $P < 0.05$ ). All patients were applied with liver protection, jaundice removing, and symptomatic treatments. The treatments achieved sound effect, healing 315 and improving 678, while there were still 7 died. The Risk of developing complication between elderly patient and middle-young patient is shown as table 2.

## DISCUSSION

The research results show clinical characteristics of sporadic hepatitis E mainly in the following aspects: (1) Acute onset, in the early stage, some patients had fever, stuffy nose, sore throat and other upper respiratory tract infection symptoms plus obvious gastrointestinal symptoms; (2) Although jaundice is the main symptom of hepatitis E, some patients still have no symptoms of jaundice, which, however, should not exclude probability of the disease so as not to delay treatment (Xiong *et al.*, 2016; Liu *et al.*, 2016; Qin *et al.*, 2016; Chen *et al.*, 2016; Liu and Liu, 2013); (3) Super infected patients accounted for a certain proportion with severe illness; (4) HEV may overlap with other hepatitis virus, mainly HBV. Hepatitis E complicated with chronic liver disease can cause exacerbations. Patients with chronic liver disease, especially liver cirrhosis, are immunocompromised, plus liver cell damage induced by immune response, are more prone to HEV infection (Al-Ghamdi *et al.*, 2016). (5) Total bilirubin of the elderly hepatitis E patients was significantly higher than that of non-elderly hepatitis E patients. Moreover, jaundice directly causes bilirubin increase, with liver function severely damaged (Cheng *et al.*, 2014; Yang *et al.*, 2016; Erum *et al.*, 2015; Abou-Ghali and Stiban, 2015).

## CONCLUSION

In summary, sporadic hepatitis E attacks all the year round, young and middle-aged male are the main patients.

The majority of patients had good prognosis, but the elderly and super infected patients had higher complication incidence, with severe damage in liver function. Therefore, elderly patients with hepatitis E and super infected patients should be closely observed with active treatment. Plus, attention should be paid to complication prevention and control in order to improve the prognosis.

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