ACM/818

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

RISK ASSESSMENT OF THE ROLE OF FOODBORNE TRANSMISSION OF HEPATITIS E IN THE U.K.

AN UPDATE - NOVEMBER 2006

Introduction

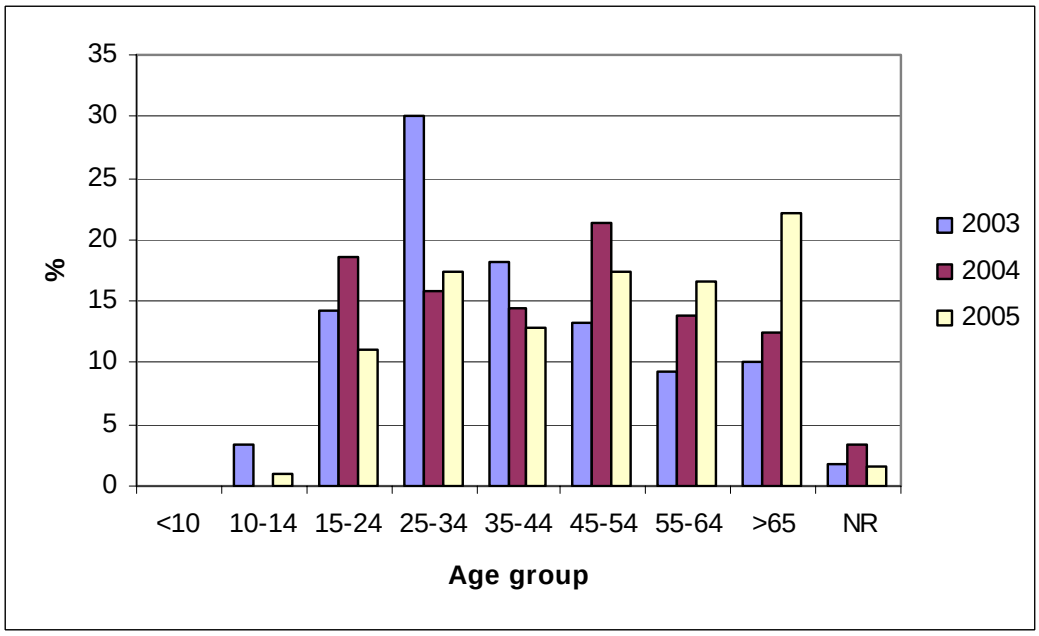
1. In September 2005, ACMSF considered a discussion paper (ACM766) which assessed the risk of acquiring hepatitis E from the food chain. This paper concluded that
   - the risk of acquiring hepatitis E through the food chain in U.K is likely to be low. However studies of the burden of infection, of transmission routes and of risk factors for acquisition are required to more accurately quantify the risk of occupationally exposed groups and consumers.
   - Current FSA recommendations, if properly implemented, should prevent foodborne transmission since proper cooking will destroy any virus present in meat.

   This update will present relevant recent work on hepatitis E.

Surveillance studies in U.K 2003-05

2. During 2005, the reference laboratories at HPA Centre for Infections and HPA Birmingham confirmed a total of 329 cases of acute Hepatitis E. This was a substantial increase compared to 125 cases in 2003 and 150 cases in 2004.

Figure 1: Age distribution of acute HEV cases by year 2003-2005 (n=604)

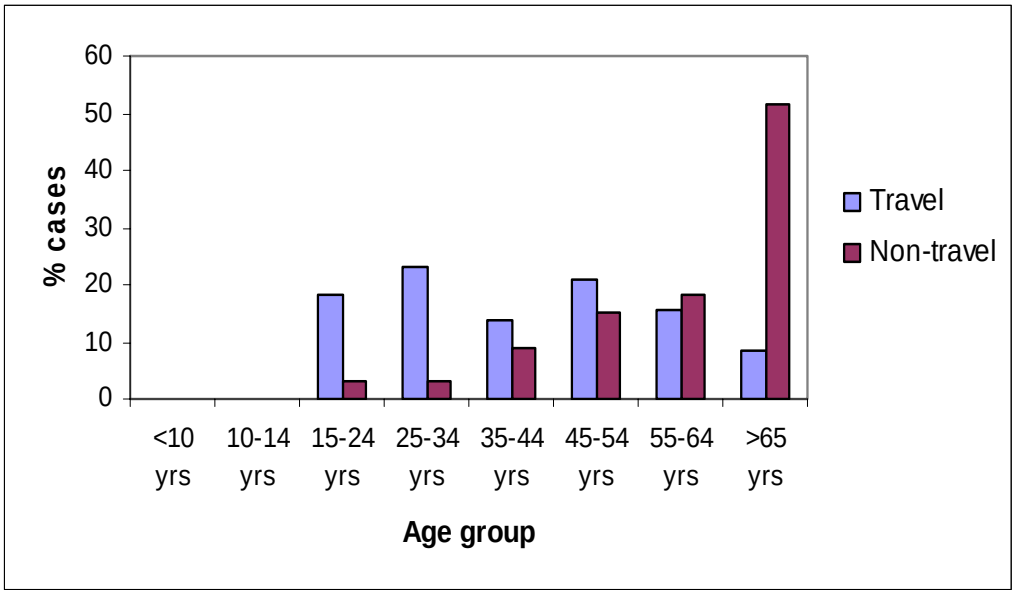


Enhanced Surveillance 2005

Demographic features all cases

3. During 2005, 329 cases of acute HEV infection were confirmed and most cases were male (71%) and almost a quarter (22%) were over 65 years of age. HEV infection was rare among children less than 15 years of age with only 2 cases reported in this age group.

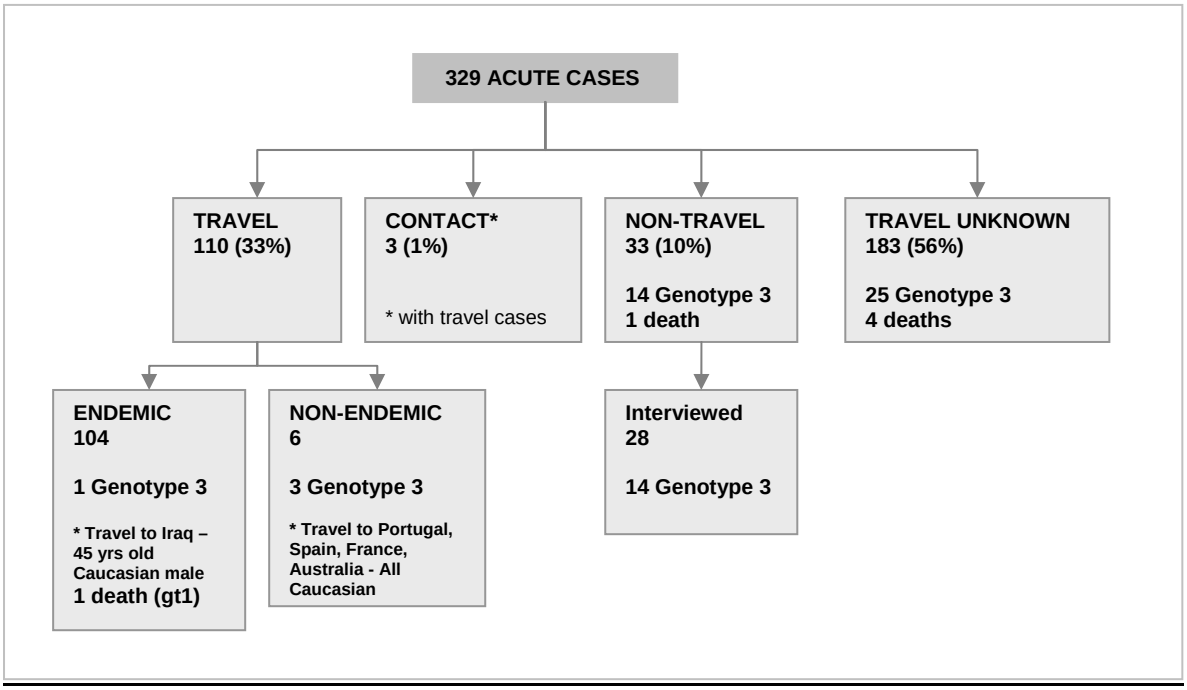
Figure 2: Age distribution of HEV cases according to travel history (n=143)



4. Six patients were known to have died during 2005. One patient was a 24 years old girl who had returned from a trip to India. Molecular analysis confirmed that she was infected with HEV Genotype 1. The remaining 5 patients who died were Caucasian and males. They were between 51 and 82 years old. One was diagnosed with autoimmune hepatitis 3 to 4 years before his death. Two patients were diagnosed with alcohol-related liver cirrhosis and the other two patients were infected with HEV Genotype 3, but no additional information was available.

Investigation of risk factors

Figure 3: Travel history of cases of acute Hepatitis E infection in 2005



5. Patients were contacted by telephone and asked questions from a structured questionnaire. Questions included demographic features and risk factors and referred to 9 weeks before illness. It asked detailed questions about travel, occupation, food and drink preferences, food preparation, animal and environmental contact, and recreational activities.

6. No common source for the acquisition of HEV was identified. Some studies have found higher HEV prevalence among workers who are in contact with pigs. However, only one case in our study had an occupation involving animal exposure (a butcher). In addition, only 5 cases lived on a farm or had visited a farm prior to their illness. The proportion of cases owning pets, especially dogs, was substantially higher (17/28, 61%) than in the general UK population, where it is estimated that 25% of households own cats and 21% dogs. High prevalence of anti-HEV antibodies have been found among dogs in India (22%) and cats in Japan (33%). However, this was an older, mainly retired group in whom pet ownership might be expected to higher than the general population.

7. Although sporadic HEV cases have been associated with consumption of undercooked pigs liver in Japan, only 7 patients interviewed had either eaten or may have eaten cooked pig liver. Other food products have been documented as potential risk factors such as deer meat and

shellfish, however no-one interviewed had eaten deer meat and only one had eaten shellfish. None of the patients ate raw meat and less than half (43%) handled raw meat for cooking. The majority washed their vegetables (71%) and fruits (61%) before eating them. Twenty-one (71%) drank water from the mains and only a minority mentioned participating in recreational activities involving water exposure (38%).

8. Clusters: A cluster of cases was defined as more than 2 cases occurring in the same month within the same postcode area. Two clusters were identified in 2005; one was in Southampton and the other in Birmingham. However, the different genotyping sequences indicated that a common source was unlikely.

New work on pigs

9. A recent study examined hepatitis E shedding in pigs at different stages of production. The principle risk stage was the first month of feeding followed by the weaners stage. Earlier reports from Japan that HEV could be detected in retail pig meat has been confirmed in the Netherlands with the detection of HEV in 4/64 pig livers tested. Studies in U.K are required and should include assessment of infectivity.

Thermal stability of hepatitis E

10. This has been investigated and shown to be less stable than HAV, but the authors conclude that it would most likely survive the internal temperature of rare-cooked meat.

Conclusion

11. The number of cases of HEV infection diagnosed increased significantly between 2003 and 2005. Evidence suggests that an increase in the number of indigenously acquired infections may partly account for the rise. During 2005, 33 cases had not travelled before they became ill, and a further 48 were highly likely to have acquired their infection in the UK. This is likely to be an underestimate of the true burden of disease. It is difficult to ascertain whether this represents a real increase or greater awareness of HEV infection in individuals who would not have previously been considered at risk.

12. The demographic features of those who must have acquired their infection in the UK was striking. The majority of cases were older, Caucasian males and thus represent a group not usually considered at risk of an infection that is likely to be enterically acquired. It is not known whether others were exposed to HEV infection and either were not infected or had a mild undetectable illness.

13. Detailed questionnaires did not identify any likely vehicles of infection. Thirty-three cases were interviewed and despite in-depth interviews, a hypothesis as to the risk factors for infections was still not generated.

Thus, it was not considered appropriate to proceed to an analytical case / control study at this point.

14. In U.K the route (and associated risk factors) for acquiring infection have not been established and further studies are needed. The earlier recommendations from ACMSF that the risk of acquiring hepatitis E through the food chain are likely to be low and that FSA cooking recommendation should prevent foodborne infections if properly implemented are still appropriate.

David Brown
Dilys Morgan
Sophie Boissant
Malcolm Banks