Hepatitis E Virus (HEV) and blood safety in England 2012

Until recently acquisition of this virus was associated solely with travel to developing countries with a poor infrastructure. However, it is now well recognised that HEV can be acquired within the UK[1] with studies indicating HEV antibody (anti-HEV) seroprevalence rates in the English human population to be between 10 and 15% in adults with an overall annual attack rate of between 0.1-0.2%. The incidence does not vary across the age groups and it is estimated that in the region of 62,000 infections occur per year in England[2] implying that the majority of HEV infections in England are asymptomatic. However, clinical cases of hepatitis E are at an all time high this year.

The genotype 3 virus is thought to be primarily transmitted zoonotically in the UK. Pig meat is thought to be the dietary source (unpublished data HPA) and HEV RNA has been detected in sausages in the UK[3] and pork and game meats elsewhere[4-5]. Outside the UK, higher antibody prevalence rates in paid blood donors sero-positive for other blood borne viruses and in repeatedly transfused haemodialysis patients has led to suggestions that the virus could also be acquired parenterally[6-7]. There have been reports of post-transfusion hepatitis (PTH) cases linked to HEV from several countries including the UK[8-10]. A recent study undertaken in London blood donors found 11% of donor sera to contain anti-HEV of which 0.7% were also anti-HEV IgM reactive[11]. Molecular investigation of plasma 96-mini-pools found 1% to contain detectable HEV RNA[12] confirming turnover of the virus in the donor panel and the potential for transfusion associated transmission in line with similar studies from Japan[13] and Holland (personal communication Hans Zaaijer). Recent investigations into plasma fractionation pools from across the world also reported that 10% of pools tested were HEV RNA positive[14] and recommendations for screening plasma pools for fractionation are likely.

It can be predicted that in countries which have high HEV incidence rates, transfusion associated transmissions of HEV are already taking place but that the vast majority result in an asymptomatic infection. However, these cannot be dismissed without considering the significant harm caused by persistent HEV infections in the immunosuppressed[15-16]. Current estimates indicate that a significant proportion of all components in the UK are used to give haematological support to the immunosuppressed patient.

Funding from NHS Blood & Transplant Blood Safety programme has facilitated a study to develop a better understanding of the risk HEV poses to the safety of blood. By donor screening for HEV RNA it will address:

1. incidence of HEV infection in blood donors
2. outcome of receiving HEV-containing blood/blood components
3. route of HEV acquisition in infected donors and their household contacts

This study is one component of an interlinked series of HEV related projects being undertaken in the HPA. These include a detailed study of dietary risk in cases of hepatitis E in adults in England (joint HPA Health Protection Services-HPS and Microbiology Services Division-MSD), use of next generation whole virus sequencing to provide definitive comparison between human and animal HEV (HPS, MSD and Sanger), studies on the prevalence of HEV infection in pigs coming to slaughter in the UK (HPA, DEFRA and AHVLA) which is expected to lead to *in vivo* pig challenge and virus stability studies next year as yet unfunded.

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