

HEPATITIS E VIRUS IN WILD UNGULATES IN NORTH-EASTERN ITALY

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Hepatitis E, due to a *Hepeviridae*, represents an emerging zoonosis in industrialized countries, where it could become even more important in the future. In this context, pigs are the main reservoir for zoonotic genotypes 3 and 4, and a relevant role seems to be played by wild boar; moreover, the virus has been detected in cervids, namely red and roe deer. For these reasons, Hepatitis E virus (HEV) should be taken into account as a potential hazard for wild game meat consumers and game local supply chains.

From 2016 to 2019, the Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe) carried out a research project funded by the Italian Ministry of Health (RC IZSVe 14/15), aimed at investigating on HEV prevalence and distribution in the main wild ungulate species of North-Eastern Italy, identifying factors associated with HEV occurrence and assessing the infection risk for humans namely in people exposed due to their job (vets, slaughterhouse workers, gamekeepers) or activities (hunters).

Serological and virological analyses were performed on 117 red deer, 259 roe deer and 569 wild boars regularly hunted or, for wild boar, culled for populations control programmes. Serological analyses were performed by an indirect commercial ELISA kit on meat juice from wild boar, and a commercial competitive ELISA kit on deer sera. RNA was extracted from livers, bile (wild boar only) and/or faeces, and then analysed with an ORF-3 targeting rRT-PCR protocol. ORF regions of RNAs were sequenced and investigated through a preliminary phylogenetic analysis. In order to conduct epidemiological analysis, the study area was divided into 9 epidemiological units, based on population distribution and on the presence of natural or artificial barriers possibly limiting animal movements and exchange.

Positive samples (13) were found only from wild boar and in one area only, the Euganean Hills (serological prevalence on meat juice = 17.6; 11.8-23.4, 95% C.L – virological prevalence = 7.3; 3.5-11.1, 95% C.L.). No virological positives were indeed detected outside this area or in other species. The few serological reactors detected in other areas within Verona, Vicenza, Treviso and Belluno provinces and Friuli Venezia Giulia region, were probably due to the non-absolute Sp of the test. Among the 13 wild boars testing positive for virological analysis, 7 were found positive for all the three matrices, 3 tested negative in the faeces and positive in the liver. 4 wild boars tested positive for both serological and virological tests. The search for viral RNA in the muscle, performed by now only on 1 infected subject, gave a positive result.

The phylogenetic analysis of two complete viral genomes made it possible to identify a new viral subtype within the genotype 3; moreover, the analysis of partial ORF2 sequences evidenced the close correlation of our isolates with virus found in wild boar and in one human case in recent years in central-northern Italy, thus confirming the zoonotic potential of these strains.

Concerning the results, HEV infection seems to be limited to wild boar, with a very focused distribution in a fairly small sized area, almost completely isolated, intensely man-made and not particularly suitable to pig farming, but showing a long-standing problem of wild boar overpopulation. Since other intensely sampled areas, also similar to Euganean Hills, tested negative for HEV, it can be hypothesized that HEV circulation in this area is favoured by the presence and /or intensity of specific risk factors. In this sense, the results of a still in progress serological screening on potentially exposed volunteers, operating in both the Euganean Hills and in an apparently HEV-free area, will be of great interest.