Update on equine grass sickness
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Surveillance

Equine grass sickness (EGS, equine dysautonomia) remains a frequently fatal polyneuropathy of equids. The Animal Health Trust (AHT) continues to host a nationwide surveillance scheme (http://www.equinegrasssickness.co.uk/), in which data from 1410 EGS cases, collated for the decade 2000-2009, were published previously [1]. Since 2010 a further 642 EGS cases have been reported to the surveillance scheme, with 69% occurring in England, 29% in Scotland and 2% in Wales. Reported cases since 2010 ranged in age between 5 months and 48 years, with a median age of 6 years; 48% were geldings, 46% were mares and 6% were stallions. Crossbreeds were most commonly represented (52%), with Welsh Cobs (6%), Thoroughbreds (5%) and Highland ponies (4%) the most commonly reported purebreds. EGS cases were reported in every month of the year since 2010, with 59% occurring during April, May and June, and May seeing the most cases of all months of the year. The most common presentation reported was acute EGS (50%, presenting with colic and surviving <48 hours), with 19% of cases reported as subacute (presenting with colic and surviving 2-7 days). Approximately one-third of cases were reported as chronic EGS (presenting with weight loss, surviving >7 days) and reported survival was 53%. EGS was known to have occurred previously on the same premises as 47% of the reported cases, consistent with presence of ‘higher-risk’ premises.

Randomised clinical trial of a candidate botulinum toxoid vaccine

A primary research focus remains the establishment of a causal pathogenesis, with the principal hypothesis being that EGS is toxico-infectious botulism involving intestinal overgrowth of, and neurotoxin production from Clostridium botulinum type C. As botulism and other equine clostridial diseases are successfully prevented by vaccination, it is hypothesised that C. botulinum type C toxoid vaccination will prevent EGS. Collaboration between the AHT and Universities of Edinburgh, Liverpool and Surrey has facilitated an ongoing nationwide, triple-blinded, randomised, controlled trial (RCT) of a C. botulinum type C toxoid against EGS.

A safety study was initially conducted in 15 young foals in which vaccine immunogenicity and safety were demonstrated [2], which was followed by a cross-sectional feasibility study [3]. A pilot RCT study was then conducted based on 10 high-risk premises in Scotland, enrolling 109 horses/ponies, 87 of which completed the trial [4]. The pilot study provided further evidence of vaccine immunogenicity with seroconversion evident following primary vaccination and a significant increase in antibody titres in vaccinated compared to placebo administered animals and no significant adverse reactions were reported.

Launched in March 2014, the ongoing RCT involves 84 participating veterinary practices, 120 equestrian premises and hundreds of willing owners. Recruitment for the trial was closed in September 2015 with 1,022 horses/ponies randomly assigned to vaccine/placebo treatment groups and as of April 2017 approximately 4,000 vaccine/placebo injections have been administered. Due to a much lower than anticipated incidence of grass sickness during the trial, the RCT has been extended to cover an additional high-risk EGS season in spring/summer 2017.
Clinical signs and diagnosis
The diagnosis of EGS remains a clinical challenge. The RCT feasibility study conducted with 119 British veterinary practices found lower confidence among veterinary surgeons in making a diagnosis of chronic EGS compared to acute or subacute EGS [3]. There remains a need for a more accurate ante mortem diagnostic technique, and research is focussing on two novel routes. Immunolabelling of rectal biopsies with beta-amyloid precursor protein (β-APP) provided more accurate histological assessment compared to conventional haematoxylin-eosin staining, with a sensitivity of 95% and specificity of 100% when compared to cranial cervical ganglia/ileal gold-standard in 21 EGS and 23 control horses [5]. The evaluation of neuronal chromatolysis in subgemmal neurons from tongue biopsy samples obtained post-mortem accurately differentiated 10 EGS and 13 control (non-neurological) horses, although with 100% sensitivity and 98.2% specificity reported, was not pathognomonic [6]. The authors also demonstrated the ability to collect samples from a standing, sedated horse and further work is required to identify the accuracy of both these techniques applied ante-mortem in clinical cases.

Treatment and prognosis
With an improving prognosis recognised for chronic EGS cases, it is prudent to gather data regarding prognosis prediction. A retrospective study of 213 chronic EGS cases hospitalised at Edinburgh University’s equine hospital between 1998 and 2013 found overall survival of 53.5% in this group [7]. The median maximum % bodyweight loss during hospitalisation was significantly lower in survivors, with survivors losing 5.9% bodyweight on average compared to 12.7% for non-survivors, although no specific week up to 28 days after admission was most predictive. As greatest percentage total bodyweight loss was similar for survivors and non-survivors, it was concluded that horses should not be euthanased solely on the basis of weight loss. A cross-sectional study of 74 chronic EGS cases reported to the AHT EGS surveillance scheme found overall survival of 47% with a median survival time of 2.4 years [8]. Although many of these cases would have been included in the Edinburgh hospital-based study, 34 cases (46%) were nursed at home and hospitalisation was not significantly associated with improved survival (P=0.7). Improved body condition score and improved appetite seen at four weeks, but not one week after diagnosis, were both statistically significantly associated with survival (P≤0.002). Six months following recovery, a third of cases were reported without clinical signs, 69% returned to exercise and 91% of owners considered surviving cases’ quality of life to be good/excellent.

References

