

Survey of multidrug resistance(MDR) mutation in Collies and other dog breeds in Korea

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Purpose: The multidrug resistance(MDR) transporter P-glycoprotein(P-gp), the product of the *MDR1* gene, exerts a protective function in the blood-brain barrier thereby limiting the entry drugs to the central nervous system. A nonsense mutation is associate with increased susceptibility to neurotoxic side effects of several drugs including ivermectin, moxidectin, dexamethasone, cyclosporin A and loperamide etc. In order to survey the frequency of *MDR1* mutation in Korea, we screened 100 dogs, Collie, Collie related dog and some breeds for the *MDR1* mutation.

Materials and Methods: Blood samples were collected from pet dog club, 22 rough- and smooth-coated Collies, 18 Border Collies, 15 Shetland Sheepdog, 12 Old English Sheepdog, 12 Golden Retriever, 11 Labrador Retriever and 10 German Shepherd. We extracted the genomic DNA from blood and analyzed for the mutated *MDR1* allele using PCR and Ultra rapid Real-Time PCR(GenSpector TMC-1000, Samsung, Korea).

Results: Collies(36.4%, 45.5%), Border Collies(5.6%, 11.1%) and Shetland Sheepdog(6.7%, 20.0%) are affected by homozygous and heterozygous *MDR1* mutation, respectively. The others were tested for homozygous intact *MDR1* alleles.

Conclusion: The development of a simple, fast, robust diagnostic test provides an excellent opportunity to reduce the frequency of *MDR1* mutation in Collie and Collie-related dog through a structured selective breeding programme, and also help these dogs be the safety of drug therapy in clinics.

Key words: *MDR1*, Ivermectin, PCR, Genspector, Collie

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