Haptoglobin concentration in galgos and greyhounds


Greyhounds and galgos Españoles (Spanish greyhounds, GEs) share common origins, and are thus closely related breeds (same breed group and section, according to the Fédération Cynologique Internationale).

Clinicopathological peculiarities of greyhounds have been extensively studied over the last decade. These haematological, haemostatic and biochemical idiosyncrasies have been recently reviewed (Zaldívar-López and others 2011). Despite the similarities between GEs and greyhounds, there are selected phenotypical and physiological differences between them. For example, while greyhounds have a very low frequency of dog erythrocyte antigen 1.1 on the surface of the red blood cells (<15 per cent) (Iazbik and others 2010), GEs have a high frequency (>30 per cent) (Mesa and others 2009).

In 2009, the authors reported that greyhounds have lower serum haptoglobin (Hp) concentrations than non-greyhound dogs; Hp was measured by colorimetric and immunoturbidimetric methods, and confirmed through electrophoresis (Couto and others 2009). Besides systemic immunomodulatory effects (ie, fever, leucocytosis, etc), acute phase response includes changes in the concentrations of acute phase proteins (APPs), which are classified as negative (downregulated) or positive (upregulated). Hp is a positive APP, whose concentration increases rapidly in response to inflammation or tissue injury (Martínez-Subiela and others 2002), in order to remove the noxious stimuli, and restore homeostasis. Hp also acts as a free haemoglobin (Hb) scavenger, preventing tissue oxidative damage and renal dysfunction (Nielsen and others 2010), and has bactericidal effect in infected wounds (by limiting the availability of iron for bacterial growth through Hb-binding) (Murata and others 2004). Hp in dogs is a moderate APP (Conner and others 1983), and changes in concentration have been shown to be of diagnostic and prognostic value in inflammatory processes, such as infectious diseases (leishmaniosis (Martínez-Subiela and others 2002), trypanosomiasis (Ndung’u and others 1991) and after surgical trauma (Ceron and others 2005).

Based on the historical, phenotypical and physiological similarities between the two subbreeds, the authors hypothesised that the low Hp concentration is a common feature of the sighthound group, and thus GEs will have similar Hp concentration to greyhounds. The objective of this study was to measure Hp in GEs, and determine if they are similar to previously reported Hp values in greyhounds.

Venous samples were collected from the jugular vein of 21 healthy adult GEs at the Clinical Veterinary Hospital at the University of Córdoba. Samples were processed within one hour of collection: blood was immediately placed into tubes with EDTA anticoagulant, and centrifuged at 1300 g for 10 minutes; plasma was aliquoted into Eppendorf tubes and immediately frozen at −80 °C. The following day, all the samples were sent overnight as a batch to the Veterinary Clinical Pathology Laboratory at the Veterinary Hospital at the University of Murcia for analysis. Samples were kept frozen at −80 °C until analysis, which was performed three days later. Plasma Hp was measured using a colorimetric Hb-binding method (Tri Delta Phase, Tri Delta Development). Crossreactivity between the polyclonal goat antihuman Hp antiserum and canine Hp was previously demonstrated by radial immunodiffusion and ELISA tests (Teclés and others 2007). The analysis was performed using a biochemistry autoanalyser (Cobas Mira Plus; ABX Diagnostics), and results were reported in grams per litre (g/l). The same samples were analysed again the following day in order to evaluate the intra-individual variability through coefficient of variation (CV). GraphPad Prism was the software used for statistical analysis. GE data were analysed with descriptive statistics and tested for normality using the D’Agostino & Pearson omnibus normality test.

Since there were two Hp measurements (one day apart), mean values for each dog were calculated, and that was the value used for descriptive statistics. Data in GEs were normally distributed, with a mean of 1.78 g/l (sd, 1.41 g/l), and ranging from 0.13 to 4.52 g/l. Intra-individual CV over the two analyses was very low (2.85 per cent). Raw data (greyhounds and non-greyhounds) from previous publication (Couto and others 2009) were used for the graphical representation (Fig 1).

GEs have plasma Hp concentrations similar to those in other dogs (Ceron and others 2005), in contrast to their closely related sighthound
Overview of the dog: the greyhound

The greyhound is a highly specialized animal, adapted for speed and endurance. Its physical characteristics are optimized for its breed-specific role. Understanding the unique aspects of the greyhound's physiology is crucial for veterinarians to provide appropriate care.

Key points:
1. **Specialized Anatomy and Physiology**
   - The greyhound has a shorter, lighter frame, allowing for faster movement. This is evidenced by its reduced body mass and increased red blood cell count compared to other canine breeds.
   - Greyhounds have a higher heart rate and a greater capacity for aerobic exercise.

2. **Specialized Reproduction**
   - Greyhounds are highly fertile and have a higher rate of litter size compared to other breeds.
   - Reproductive health is critical for maintaining the genetic diversity of the breed.

3. **Specialized Diet**
   - Greyhounds require a diet that is high in protein and low in fat, tailored to their energetic needs.
   - Proper nutrition is essential for maintaining optimal health and performance.

4. **Specialized Exercise**
   - Greyhounds are bred for speed and should not be subjected to prolonged periods of high-intensity exercise.
   - Regular exercise, such as daily walks or supervised play, is beneficial for their well-being.

5. **Specialized Behavioral Traits**
   - Greyhounds are known for their high energy levels and need for mental stimulation.
   - Early socialization and obedience training are important for their socialization and behavior.

6. **Specialized Health Considerations**
   - Greyhounds are prone to certain health issues, such as kidney disease and joint problems, necessitating regular veterinary check-ups.
   - Understanding these health concerns is vital for proactive care.

7. **Specialized Environmental Factors**
   - Greyhounds need a secure, enclosed environment to prevent escape and injury.
   - Proper housing and living conditions are essential for their comfort and safety.

Greyhounds are an extraordinary breed with unique needs that require specialized attention from their owners and veterinarians. By recognizing and addressing these specialized aspects, we can ensure the health and well-being of these remarkable animals.
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