What exactly is GSDIVA?

What is GSDIVA?

How is it genetically transmitted?

How is it diagnosed?

Signs and symptoms to watch for in the dog?

Will the pup outgrow the condition?

Treatments for the condition?

What constitutes a normal test?

What are the optimal ages for performing the Holter monitor?

German Shepherd Dog Inherited Ventricular Arrhythmias

IVAGS

Inherited Ventricular Arrhythmias of German Shepherd

Other breeds?

Ventricular Arrhythmias

• ventricular extra or premature beats
• Can be individual beats, pairs, triplets or runs of ventricular beats called salvos (short bursts) or sustained runs called ventricular tachycardia
Electrical System in heart - generates the ECG

Ventricular Tachycardia

What exactly is GSDIVA?
What does that mean for the dog?
• Sudden death typically occurs only in dogs with Ventricular Tachycardia
  • >10 runs @ >350 bpm = 50% sudden death
  • Dogs most commonly die suddenly at 7 months of age
• No other clinical abnormalities are present. Arrhythmia is the only one.
  • Dogs that die typically do not have structural changes
• Arrhythmia due to change at cellular level with ion channels related to repolarization, K+ channel and Ca cycling. Plus heterogenous sympathetic innervation.

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Sudden death typical only if VT

VT = ventricular tachycardia

Single ventricular premature complex VPC
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Holter is a 24 hour recording of the ECG
Like minimum of 20 hours

VT is most often seen when at rest, or rapid eye movement sleep
During rest following excitement or exercise

In 24 hours:
<50 ventricular premature beats is normal.
What constitutes a normal test?

In 24 hours:

- <50 ventricular premature beats is normal.
- Between 50-60 beats, singles only is equivocal
- > 60 beats, especially with pairs or triplets, is abnormal
- < 50 with pairs or triplets is equivocal
- Escape beats do not count VPCs

Abnormal Holter

195 singles, 7 months

Abnormal Holter

73,000 VE, 3500 runs, longest 14, 6 months

Abnormal Holter

Used with permission, from animmod spon arrhydeath J CVElectph97 Moise

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What are the optimal ages for performing the Holter monitor?

- Sudden death can occur anytime between 3 to 18 months.
- Peak affected period appears to be 6-7 months.
- Arrhythmias will start to decrease after a year of age and may be completely gone by 18-24 months.
- Rare to have arrhythmias prior 3 months of age.

Ideal time if doing single Holter – 6-7 months of age.

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Will the pup outgrow the condition?

• VA is rare to see after 24 months
• Dogs reaching 2 years of age typically live normal life.

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• 3 traits for heritability: 1) single VPCs 2) couplets 3) 3 or more VE as VT
• May be genetic variation for 3 traits
• No simple recessive or dominant inheritance. No indication of sex bias.
• Mildly affected dogs could produce dogs with VT. Matings between dogs with VT produced unaffected dogs, mildly affected dogs and VT dogs
• Breeding unaffected to affected produced full spectrum
• One breeding of 2 unaffected dogs did not produce affected, but few pairings.
• Heritability for affectedness is very high

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Treatments for the condition?

- Medical therapy
  - Sotalol
  - Amiodarone
  - Mexilitine/tocainide
  - Proarrhythmia
- Pacemaker
- Defibrillator
- Nothing

Treatments for the condition?