



Australian Shepherd Health & Genetics Institute, Inc.

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Juvenile Renal Dysplasia

by

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What is JRD?

Juvenile renal dysplasia (JRD) is an important category of kidney diseases in dogs. Dysplasia is defined as abnormal growth or development of cells or organs. In the case of JRD the kidney fails to develop properly in the womb. At birth immature structures consisting of undifferentiated fetal cells or tissue types are found in the kidney and are persistent throughout the life of the animal.

Some dogs develop serious disease as puppies and usually die before a year of age. Others become ill later in life. Treatment may help these dogs for a while but they will have shortened life spans because of the disease.

Most dogs with the mutation don't develop disease at all, but for those who do it is a serious and life-threatening situation.

What to look for in young animals

Some of the early signs of JRD in puppies over 10 weeks may include excessive drinking and urination and pale (dilute) urine.

Often there are problems with housebreaking.

IMPORTANT

Most animals that harbor one or two copies of this mutation will have some minor defects in the kidney that can only be seen on biopsy. This does NOT affect the overall health of the animal. Their kidneys function normally and appear normal on the gross scale. Some may be biopsy negative. Any of these cases can, however, produce JRD affected progeny.

When clinical cases do arise the results can be devastating and individuals die from end stage renal failure.

How is JRD inherited?

JRD is inherited as "dominant with incomplete penetrance, similar to the HSF4 cataract mutation previously identified in Australian Shepherds. This means that animals with one or two copies of the mutation are at risk for developing the disease and/or passing this on to their progeny.

How to test

ASHGI now offers the JRD test at its clinics. If it is not convenient to attend a clinic with your dog, you can order a kit from:

DOGenes, Inc.
151 Sherin Ave.
Petersborough, ON K9J 7V5
705-748-0089
www.dogenes.com
info@dogenes.com

What does the genetic test tell you?

The DNA test results are reported as follows:

- a) Carrier - (one copy of the JRD mutation)
- b) Homozygous mutant allele = Homozygote (two copies of the JRD mutation)
- c) Clear - No copies of the JRD mutation are present.

With a) or b) results the animal is *potentially* affected by JRD or may be normal. It should be monitored by its veterinarian so it can receive treatment should it become ill.

Breeding decisions

At this point we do not know the frequency of the JRD in Aussies. Until we have a better understanding of the frequency, it would be best to follow the advice below.

Test Result Clear - There is no need to restrict the breeding of this dog due to JRD. If you are trying to clear your line of the JRD mutation, give preference to clear tested dogs over their carrier or double-mutant siblings.

Test Result Carrier- These

dogs have one copy of the JRD mutation. You can breed out the mutation in one generation. As long as they are clinically normal (no sign of kidney disease) breed them only to dogs that have tested clear. Use the best quality clear offspring to carry on with. There is a 50% chance of producing a clear progeny in a clear-to-carrier cross. If you breed to another carrier 75% of the progeny will have at least one copy of the mutation.

Test Result Homozygous -

This dog has two copies of the JRD mutation. It takes two generations to breed out the mutation. If the dog is clinically normal and has significant positive traits you wish to preserve, breed it only to dogs that have tested clear for the mutation. All the puppies from such a cross will be carriers. Take the best of those, breed them to dogs that are tested clear then carry on with the best of the progeny.

Dogs which are clinically affected with JRD should not be bred. If the dog was bred prior to diagnosis, it should be withdrawn from further breeding. Offspring should be tested to determine their status. Give preference to clear offspring for further breeding but if there are carrier or homozygous offspring that are of high quality, breed them as per the advice above for those categories.

Down the Road

Your ultimate goal is to breed only clear to clear. Through effective use of the JRD test and careful breeding decisions you can eliminate JRD from your kennel

without having compromised the
gene pool. Rev. 9/14/09