FELINE NEONATAL ISOERYTHROLYSIS

Clara Mariné Canals, June 2017

INTRODUCTION

Feline neonatal isoerythrolysis (FNI) is a haemolytic disease characterized by immune-mediated destruction of red blood cells. It occurs when kittens with blood group A are born from a mother with blood group B. Type B queen possess naturally occurring alloantibodies against type A cells that can be transferred to the kitten via colostrum.

Prevalence of FNI is unknown, but depends on the number of type B cats in a population, and different studies have shown how feline blood types vary geographically and among breeds.

OBJECTIVES

The objective of this project is to make a literature review of the most recent scientific papers about feline neonatal isoerythrolysis.

BLOOD GROUPS

	A	B	AB
Alloantibodies in plasma	Anti-B (low titers of low-affinity antibodies)	Anti-A (high titers of high-affinity antibodies)	None
Antigen in plasma	A (in heterozygous cases there can be certain amounts of B antigen)	B	A and B

The form of neuraminic acid attached to the glycolipids of the red cell determine the antigen type A and B. Type A blood has mostly $[NeuGc]_2G_{D3}$, and type B has only $[NeuAc]_2G_{D3}$.

	Phenotype	Genotype
Feline blood groups	A	AA, AB, Aa^{ab}
	B	bb
	AB	$a^{ab}a^{ab}$, $a^{ab}b$

Types A and B are the predominant feline blood, being A much more common. Type AB is rare. Inheritance of blood groups is autosomal Mendelian, A being dominant over B. Inheritance of blood group AB is not known, but it seems to be related to a third allele dominant over b and recessive over A.

Cats have naturally occurring alloantibodies against the blood type they lack, so there is no need for previous exposition to blood to create antibodies, which are believed to result from exposure to epitopes commonly found in nature.

PREVENTION

Avoid incompatible matings

Remove kitten from the mother during 16-24h

↓

Failure in passive immunity

Remove type B cats from the population

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Reduction of genetic variation

↓

Let kittens nurse from a queen with blood group A. → <u>best option</u>
Previously frozen colostrum from another queen.
Artificial colostrum.
Parenteral administration of adult serum (150mL/Kg).

Blood typing is crucial for the preventing programs of FNI. Blood typing agglutination card is the most commonly used test for blood typing.

Rapid-Vet-H Feline Card. Macroscopic aglutination appears on the B sample, so this blood was typed as B.

CLINICAL SIGNS

Pigmenturia, haemoglobinuria, weakness, jaundice, anaemia, tachypnea, tachycardia, nephropathy, disseminated intravascular coagulation, pale mucous membranes, tail tip necrosis and death.

TREATMENT

Life support treatment should be provided immediately

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Remove kittens from the mother 16-24 h after birth

↓

Replace immunological protection

If necessary (anaemia becomes worse and hypoxia appears)

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B blood cells transfusion (the queen being the best donor candidate)

Even proceeding correctly mortality rate associated with FNI is high.

CONCLUSIONS

When doing a diagnosis of feline neonate mortality, the geographical zone and the breed should be taken into account to consider FNI as an important differential diagnosis. In countries where there is a high frequency of blood type B it is higher in nonpedigree cats, probably because these cats, unlike pedigree cats, are not usually bred under control and selection of blood groups to prevent diseases such as FNI.

In general, FNI is rare, even so, mortality rate is high and little can be done when it appears. For this reason, taking preventive actions is the major step in managing this disease, and avoiding incompatible matings is the best way to do it. For this reason, determination of blood types in breeding animals plays a very important role on FNI prevention.

References: Proverbio, *et al.* 2011. "Comparison of Gel Column Agglutination with Monoclonal Antibodies and Card Agglutination Methods for Assessing the Feline AB Group System and a Frequency Study of Feline Blood Types in Northern Italy." *Veterinary Clinical Pathology* 1: 32–39.