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IN VITRO EVALUATION OF COMPATIBILITY OF FELINE TYPE-B BLOOD WITH CANINE AND FELINE BLOOD OF DIFFERENT BLOOD TYPE

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Cats have no naturally occurring antibodies against canine red blood cell (RBC) antigens, therefore, xenotransfusion of canine blood to a feline recipient is still used in emergencies [1,2]. This practice is particularly helpful in type-B recipients for which it is sometimes difficult to find a compatible feline donor, due to their rarity in feline population (from 5.2% to 12.1% in North and South Italy, respectively) [3]. However, data on compatibility of canine blood with type B cats are limited. The aim of this study was to evaluate *in vitro* compatibility of feline type-B blood with canine blood in comparison to type-A or type-B blood. Forty-nine type-B cats were crossmatched using a slide crossmatch (XM) technique with at least one DEA1+, DEA1- canine blood and one type-A feline blood. Both major and minor XMs were performed with macro- and microscopic evaluation of agglutination. Of 49 type-B cats, 35 were also major crossmatched with at least one type-B cat. A total of 214 major XMs were performed, 165 with canine blood and 49 with type-A feline blood, of which 91 were incompatible: 43/165 (26%) with canine blood samples and 48/49 (98%) with type-A feline samples. Only the species had a statistically significant association (P<0,0001) with incompatible XM results, with type-A feline blood having a significant relative risk (RR) of 3.7 (95%CI:2.8-4.8, P<0.0001) of incompatibility with type-B feline blood. Of 201 minor XMs performed, 153 were with canine blood and 48 with type-A feline blood. Incompatibility was found in 150 minor XMs, 131/153 (86%) canine samples and 19/48 (40%) type-A feline samples. Species (P<0.0001) and DEA blood type (P=0.0001) were significantly associated with incompatibility, with canine blood and DEA1+ type having respectively a RR of 2.1 (95%CI:1.5-3.0, P<0.0001) and 1.3 (95%CI:1.1-1.5, P=0.0006) of incompatible minor XM. Relative to the 35 type-B cats crossmatched with type-B cats, of 71 major XMs performed, 25 (35%) were incompatible. No significant difference (P=0.1555) was found for type-B blood major XM incompatibilities between canine blood and feline type-B blood. In emergencies, when compatible feline blood is not readily available, type-B cats could be transfused with canine blood, if possible, using DEA1- packed RBCs. Due to incompatibility outside the AB feline blood group system, major XM should be always performed before feline transfusions, even when blood type compatible blood is being transfused.

[1] Le Gal, A., Thomas, E. K. & Humm, K. R. Xenotransfusion of canine blood to cats: a review of 49 cases and their outcome. J. Small Anim. Pract. 61, 156–162 (2020).
[2] Tinson, E., Talbot, C. T. & Humm, K. Incidence of acute haemolysis in cats receiving canine packed red blood cells (xenotransfusions). J. Feline Med. Surg. 24, e628–e635 (2022).
[3] Spada, E. et al. Prevalence of Blood Types and Alloantibodies of the AB Blood Group System in Non-Pedigree Cats from Northern (Lombardy) and Southern (Sicily) Italy. Animals 10, 1129 (2020).