WHOLE BLOOD TRANSFUSION IN CATS – SUCCESSFUL MANAGEMENT IN THREE CASES

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In some cases anemia in cats is often an indication for blood transfusion but is relatively limited in India. This observation reports feline whole blood transfusion in three cats during 2013-14 in the TANUVAS Animal Blood Bank, Madras Veterinary College. In all the three anemic cats presented, clinical examination revealed hypothermia, poorly perfused and blanched mucous membranes, aortic thudding at abdomen level and related secondary complications of inappetance, orthopnea. The three anemic cats were presented with right fore limb crush injury, haemoprotezoan induced anemia and chronic renal insufficiency respectively. Blood Groups all the cats were identified as type A and the selected donors were also type A. Whole blood transfusion was done after a major and minor cross match. The cat with crush injury was successfully amputated. The other case with haemoprotezoan induced anemia was treated and reviewed in good health after a month. The third case with chronic renal insufficiency developed renal complications after 2 months and succumbed to death. These case reports discuss uncommon whole blood transfusion in cats and the importance of blood typing for safe transfusion in cats.

Keywords: Feline, Whole blood transfusion, Type A, Type B.

Feline blood transfusion is relatively limited in Veterinary practice in India. In some of the cases, anemia in cats is the indication for blood transfusion where fresh whole blood is typically administered at emergency moments. Circulatory overload is a relatively common transfusion complication in small animals (especially in cats) and is usually associated with the rapid administration of whole blood to patients with cardiac disease, renal failure or normovolaemic anaemia (Turnwald and Pichler, 1985). Most type B cats have powerful naturally occurring anti-A alloantibodies, such that transfusion of type A blood into a type B cat will result in an acute hemolytic reaction. Type AB cats do not possess anti-A or anti-B antibodies and can be safely transfused with type A blood. Although a type AB cat could theoretically receive RBCs from a type A or type B cat, anti-A alloantibodies in plasma from a type B cat could cause a reaction (Jenny and Clare, 2010). This early reaction can be fatal, that is why unmatched blood should never be used for cat blood transfusions; Type A cats receiving type B blood. Although type A cats often have weak anti-B alloantibodies, transfused type B (donor) cells can have a mean half-life of as little as two days. The haemolysis that occurs is extravascular and clinical signs are therefore much milder. The main clinical significance is that PCV will fall to pretransfusion levels within days of the transfusion (Callan and Giger, 1994). The AB Blood group system is recognised in cats consisting of type A, type B, type AB and the A allele being dominant over the B allele. Although type A is the most common blood type and AB is the most rare blood type in cats, the frequency of type A and type B in domestic short hair cats varies world wide (Giger et al., 1991). Jenny and Clare, (2010) opined that type B cats normally have high titer of anti-A antibodies and if they receive A blood, they will eventually show massive fatal hemolytic reactions. Type A cats have weak titre of anti-B antibodies and if they receive B blood will show mild hemolytic reactions within 3 days, hence forth making the blood typing most mandatory in cats before a transfusion.

Feline Blood typing enables the Veterinarian to identify the blood group of the patient or a candidate donor. This assay is based on a haemolytic or agglutinating reaction in which the reagent or antibody reacts with the RBCs of the test subject. The crossmatching test does not identify the blood group but, instead, detects serological
incompatibility between a candidate donor and the patient. Reasons for testing, using either of these methods, prior to transfusion include the need to avoid an acute haemolytic reaction during or following transfusion, an assurance of an optimal lifespan of the transfused RBCs, the prevention of incompatible blood transfusions in the future, and the prevention of neonatal isoerythrolysis.

**Materials and methods**

**Case 1**

A four year old male recumbent Domestic Short hair tom cat weighing 4.2 kgs was admitted in the Small Animal Inpatient ward of the Madras Veterinary College Hospital with a recent history of road traffic trauma involving right fore limb crush injury and severe blood loss (Fig. 1). Clinical exam revealed hypothermia, poor perfused and blanched mucous membranes, aortic thudding at abdomen level and related secondary complications of inappetance, orthopnoea and recumbency and signs of wound sepsis at the left fore meta tarsal. Blood profiles on the recumbent cat indicated severe pancytopenia of Hb 5.4 g/dL, PCV 14 %, R.B.C 2.7 mill.

**Case 2**

A nine year old male DSH cat weighing 3 kgs was presented with uremic signs, polyuria, polydipsia, dehydration more than 6%, weight loss, vomiting, lethargy, inappetance and blanched mucous membranes, aortic thudding at abdomen suggestive of anaemia (Fig. 2). The biochemistry parameters showed elevated Blood Urea of 124 mg/dl, creatinine of 5.2 mg/dl, elevated phosphorous values suggestive of Chronic Renal Failure.

**Case 3**

A five year old male DSH cat weighing 3.5 kgs was presented with clinical signs of anemia, fever lateral recumbency, hypothermia, dyspnea, labored breathing, dehydration and aortic thudding at abdomen (Fig. 3). This feline was tested positive for *Haemobartenalla felis* on blood smear.

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**Fig. 1. CASE-1: The fore limb crush injury**

Healthy tom cats aging between four to six years and weighing 4 to 4.5 kgs. brought for vaccination was selected as blood donors with the consent of the owners. Two ml. of EDTA blood was collected (Fig. 4) and the feline donor blood parameters were within normal range viz. Hb 13.5 to 14.7g/dL,

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**Fig. 2. CASE-2: Chronic renal insufficiency**

PCV 40.6 to 43.5 %, R.B.C 7.2 to 8.5 m cells/cmm, Platelets 3,50,000 to 3,82,000 cells /cmm, leucocyte count of 7,000 to 8,400 cells/cmm. Using the Alvedia quick feline blood typing kit (Fig. 5) (Alvedia,11-13 Rue des Aulnes,69760 Limonest, France,ph +33 478 380 239) that uses
immunochromatographic column gel technique, both the donor and the recipient cats were typed as type A (Fig. 6) with the given test procedure. Major and minor cross match were done to ensure further compatibility and no agglutination was observed.

The donor cats were controlled under general anesthesia induced by diazepam and ketamine and prepared for donation. About 30 ml of whole blood was collected from the jugular vein (Fig. 4) of the donor cat using Citrate Phosphate Dextrose as the anticoagulant in a 50 ml syringe slowly with constant tilting of the syringe up and down to ensure proper mixing of the whole blood with the anticoagulant according to the standard procedure.

The whole blood was transfused through the femoral vein of the recipient cat slowly over a period of 20 minutes with all necessary precautions and also to avoid circulatory shock. The recipient cats were kept under observation for 24 hours for post transfusion reactions and follow up.

Results and Discussion

Case 1 showed mild hypothermia (99 degrees F), inappetence and lethargy during the first 24 hours. Then, 48 hours post transfusion the cat showed good improvement especially in terms of blood picture, pink mucous membranes, self grooming, normal...
temperature, pulse and respiration, feeding, urination and bowel patterns. Mid tibial amputation was carried out successfully under general anesthesia and the cat was discharged in 3 weeks with a normal recovery. The cat was reviewed after 2 months in good health.

**Case 2** cat experienced fever and vomiting during the first 24 hours of vomiting but slowly subsided on the next 72 hours by fluid and antihistamine therapy. Subsequent follow ups were carried out during the following weeks. The cat died of uremic encephalopathy, two months post transfusion.

**Case 3** had low grade fever for the first 24 hours and subsequently showed signs of appetite, activity, self grooming, intake of water. The cat responded well to doxycycline @ 5 mg/kg. b wt for 3 weeks and was reviewed in good health.

### TABLE-I: Summary of Pre and Post Blood Transfusion Scenario

<table>
<thead>
<tr>
<th>CASE</th>
<th>SIGNALMENT</th>
<th>HAEMATOLOGY</th>
<th>BLOOD GROUP OF THE DONOR</th>
<th>BLOOD GROUP OF THE RECIPIENT</th>
<th>MAJOR MINOR MATCH AND CROSS MATCH</th>
<th>VOLUME</th>
<th>REACTIONS WITHIN 24 HOURS</th>
<th>SEQUALE</th>
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<tbody>
<tr>
<td>Case 1</td>
<td>road trauma /cat /male/ 4yrs / 4.2 kgs</td>
<td>Hb 5.4 g/dl, PCV 14 %, R.B.C 2.7 m cells/cmm, Platelets 1,90,000 cells /cmm, W.B.C 24,000 cells/cmm</td>
<td>Type A</td>
<td>Type A</td>
<td>No agglutination</td>
<td>25ml</td>
<td>Hypothermia, lethargy</td>
<td>Responded to treatment and reviewed healthy</td>
</tr>
<tr>
<td>Case 2</td>
<td>chronic renal insufficiency /DISH/cat / female/ 9yrs / 3kgs</td>
<td>Hb 4.2 g/dl, PCV 16 %, R.B.C 1.8 m cells/cmm, Platelets 1,20,000 cells /cmm, W.B.C 6,000 cells/cmm</td>
<td>Type A</td>
<td>Type A</td>
<td>No agglutination</td>
<td>22 ml</td>
<td>Shivering, Vomiting</td>
<td>The cat died after 2 months due to uremia</td>
</tr>
<tr>
<td>Case 3</td>
<td>Blood Protocan Anaemia due to Haemobartonella felis /DISH/cat / male/ 5yrs / 3.5 kgs</td>
<td>Hb 3.5 g/dl, PCV 12 %, R.B.C 1.7 m cells/cmm, Platelets 60,000cells /cmm, W.B.C 16,000 cells/cmm</td>
<td>Type A</td>
<td>Type A</td>
<td>No agglutination</td>
<td>20 ml</td>
<td>Fever</td>
<td>Responded to treatment and reviewed healthy</td>
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**Conclusions**

In our country, we are still nascent in the field of cat transfusion medicine and seldom cases are transfused during crisis. Lack of feline blood typing kits, cat blood storage bags and awareness on incompatibilities are the most common causes of reduced potential for cat transfusions. These case reports discusses uncommon whole blood transfusion in cats and the importance of cat blood typing and cross matching for safe transfusion in cats.

**References**


Practicalities of blood collection and administration. *In Practice, 32*: 231–237.


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