NOTE  Internal Medicine

Thiazole Orange Positive Platelets in a Dog with Evans’ Syndrome

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ABSTRACT. We examined transition for the percentage of reticulated platelets (RP%) and platelet count in a canine case of Evans’ syndrome. The result demonstrated that measurement of the RP% can be useful in evaluating platelet production in the bone marrow and response to treatment.

KEY WORDS: canine, Evans’ syndrome, reticulated platelets.


Evans’ syndrome defines the co-occurrence of immune-mediated hemolytic anemia (IHA) and immune-mediated thrombocytopenia (IMT) in humans and animals [1, 6]. This disease has been sometimes found in dogs and cats, but its pathogenesis is not clear.

In the previous study, thiazole-orange (TO) positive platelets were counted by flow cytometry to evaluate the percentage of reticulated platelets (RP%) in healthy and thrombocytopenic dogs [3, 4]. These reports indicated that the RP% of dogs should be very useful for screening candidates for bone marrow aspiration as well as understanding the bone marrow function.

In this report, we examined the RP% in a canine case of Evans’ syndrome evaluating the condition of platelet production in the bone marrow.

A 6-month-old, female Chihuahua was referred with weakness to Nihon University Animal Medical Center, Kanagawa, Japan.

Physical examination revealed pallor of mucosae. Thoracic and abdominal radiographs were normal. A complete blood count indicated macrocytic normochromic anemia (packed cell volume [PCV] 15 percent; red blood cell [RBC] 1.78 × 10⁶ cells /µl; MCV 78.1 fl; MCHC 36.0 g/dl) and thrombocytopenia (platelet [PLT] 17 × 10⁹/µl). Results of serum biochemical analysis were within normal limits and coagulopathy was not recognized (prothrombin time 7.9 sec; activated partial thromboplastin time 16 sec; Fibrinogen 740 mg/dl; AT-III 80%; FDP 2.5 µg/ml). Reticulocyte % was 3.9 percent. On peripheral blood smear, there were erythroblasts, polychromatic cells and spherocytes, and platelets were few and some were larger than normal. These results indicated regenerative anemia. A Coombs’ test was positive (antibody titer 1:256), suggesting immune-mediated hemolytic anemia. Therefore, the patient dog was diagnosed to be a case complicated with IHA and IMT, namely Evans’ syndrome.

The percentage of reticulated platelets was determined by a flow cytometric method as described by Hanahachi and others [4]. The RP% of the case was 62.8%.

Fig. 1. Sequential analysis of reticulated platelets (RP) plotted with platelet counts and reticulocyte % plotted with RBC count under treatment with prednisolone in a dog with Evans’ syndrome.
The patient dog was treated with prednisolone (2 mg/kg bid p.o.). Four days later, the RP% was 35.0% and reticulocyte % was 8.9% (Fig. 1). Seven days later, the PLT count had recovered and the RP% decreased to the normal range (Fig. 1). The RBC count and PCV were low, but the reticulocyte % remained high. Fourteen days later, PLT and the RP% were maintained in the normal range, and RBC count and PCV were improving slowly (Fig. 1). Twenty days later, the RBC count and PCV recovered and the reticulocyte % was decreased (Fig. 1). Thereafter, the dog was followed up for five months without any problems.

For the treatment of immune-mediated hematologic disorders, splenectomy [2] and administration of steroids and the other immunosuppressive agents has been carried out [5]. This patient dog was treated with prednisolone alone, and its PLT and RBC count returned to the normal range.

The RP% of this dog with Evans’ syndrome was significantly increased compared to that of a normal dog [4]. The high RP% suggested that platelet production in bone marrow was accentuated, though the platelets were being rapidly destroyed. Subsequently the RP% was recovered to that of normal dogs after steroid treatment. These results demonstrated that the investigation of RP% can be a useful index of the treatment effect as well as of platelet production. Therefore, the RP% count should be helpful for understanding the disease condition.

Bone marrow aspiration is one of the best diagnostic procedures for bone marrow evaluation, but bone marrow aspiration has several disadvantages such as invasiveness, risk of complication, and cost to the owners. Repeated sample collection may also be required for a definitive interpretation. The determination of the RP% could take place of bone marrow evaluation in some cases, since it is easy to perform and noninvasive.

As for platelets, it is thought that the assay of reticulated platelets to evaluate bone marrow function is one of the examination items which should be tested before performing bone marrow aspiration.

REFERENCES