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Immune mediated haemolytic anaemia (IMHA) in mare: A case report

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Abstract

A 3½ year Marwari mare was presented at Large animal clinics of the Teaching Veterinary Hospital of the university with the history of reddish colored urine and fever since last five days. Owner suspected the mare to be having some pervaginal injury, however no apparent lesion or was evident on examination. Haematological examination revealed anemia with low packed cell volume (14.8%) and a leukamoid response with total leukocyte count(TLC) of 54050 and differential blood count revealing absolute neutrophilia (92%). Severe agglutination on peripheral blood smear examination indicated secondary IMHA, which was confirmed by positive Insaline agglutination test. Treatment was started with antibiotic course for seven days. Besides, animal was given dexamethasone 40 mg IM daily for three days followed by prednisolone 300 mg po in tapering dose for 9 days. Mare was observed for clinical recovery which was evident by normal colour of the urine and reduced TLC count.

Keywords: Secondary IMHA, corticosteroid therapy, Mare, Hemolytic anemia

Antibody mediated destruction of erythrocytes or Immune mediated haemolytic anaemia (IMHA)is a condition in which body no longer recognizes circulating red blood cells (RBCs) as their own. IMHA is unusual finding in horse where membrane of RBCs is found coated with immunoglobulins (Day, 2000). It can be classified into primary or secondary on the basis of origin. Primary IMHA is a condition in which clone of suppressed B-lymphocyte produces antibody against surface antigen of normal RBCs (Sellon, 2004). Primary IMHA can occur after blood transfusion, in neonatal isoerythrolysis and as a part of autoimmune diseases like systemic lupus erythematosus (Dunkel, 2018). Secondary IMHA is comparatively more common than primary and is either caused by alteration of RBCs membrane due to primary problem such as bacterial infection (*Clostridium perfringens*, *Rhodococcus equi* infections, Streptococcal infections), viral infection (equine infectious anemia), neoplastic process (lymphoma) (McGovern *et al.,* 2011*,* Johns *et al.,* 2011) or can be either due to antigen-antibody complex deposition on surface of RBCs or can be drug induced (McConnico *et al.* 1992; Thomas and Livesey 1998*)*.

Clinically disease is characterized by depression, weakness, tachycardia, tachypnea, icteric mucous membrane and haemaglobinuria or haemoglobinaemia (Underwood & Southwood 2008). Severity of disease depends on the extent of RBCs destruction and haemoglobin deficit. The presumptive diagnosis of IMHA can be made by pathological examination of blood smear and for confirmation, Insaline agglutination test can be done.

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Case history, Observations and Treatment

A 3½ year Marwari mare was presented at Large animal clinics, College of Veterinary Sciences, GADVASU, Ludhiana with the history of reddish colored urine (Fig.1) and fever since last five days. General demeanour of mare was found to be active and alert. Physical examination revealed tachycardia (heart rate 72 beats/min), tachypnea (respiratory rate 40 breaths/min), icteric mucous membranes (Fig.2) with normal intestinal borborygmi. Rectal temperature was found to be103.8°F. Owner suspicion of pervaginal injury was ruled out after examination. Abdominal ultrasonography was performed to figure out any possibility of intra abdominal, mesenteric or intraluminal haemorrhage.

Blood sample was collected in EDTA vial and sent to clinical diagnostic laboratory for hematological and protozoan analysis. Urine sample was sent for urinalysis. Haemogram showed anaemia with low packed cell volume (PCV=14.8%), leukamoid response with total leukocyte count of 54,050/µl and differential blood count revealed neutrophilia (92%). The platelet count was found to be normal in the range of $433x10^3$. Blood protozoan examination was negative and urine analysis revealed numerous crystals resembling hemoglobin and several squamous cells.

Fig. 1: Redish colour urine in the mare pre-treatment

Fig. 2: Icteric mucous membrane at day 0

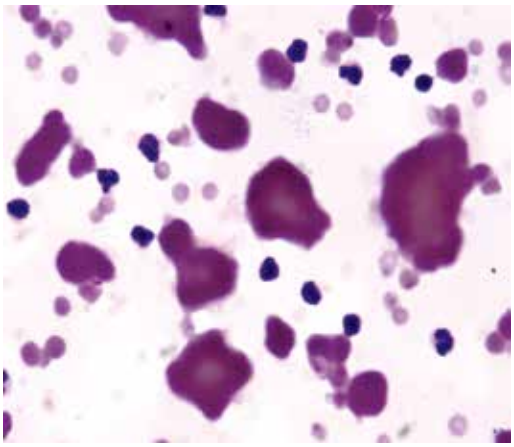

Fig. 3: Peripheral blood smear showing severe agglutination and leukemoid responsex100X

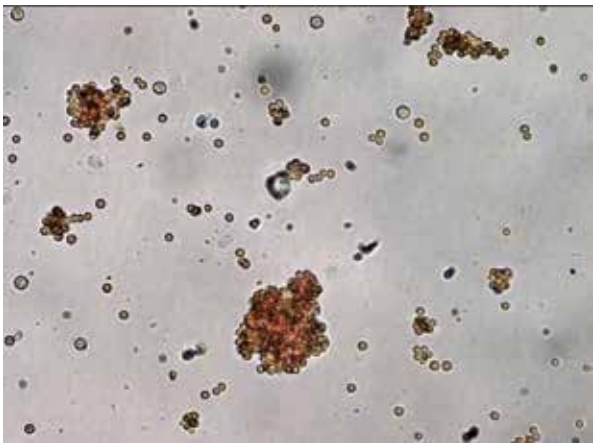

Fig. 4: Insaline agglutination test showing clumping indicative of IMHA

In the present case, neutrophilia was present along with leukemoid response indicative of bacterial infection and severe agglutination on peripheral slide examination indicated IMHA (Fig.3). On the basis of clinical signs, haematological findings and severe agglutination on peripheral blood smear examination, the case was diagnosed tentatively to be of secondary IMHA. Insaline agglutination test was performed which confirmed the case to be of IMHA. There was spontaneous aggregation of RBCs which failed to disperse even after 1:1 and 1:5 dilution with 0.9% NaCl solution, suggestive of IMHA (Fig. 4).

The animal was treated with ampicillin @ 10mg// kg body weight intramuscularly twice a day along with gentamicin @ 6.6mg/Kg body weight IV once daily for 7 days. The animal was given dexamethasone 40 mg IM daily for three days followed by prednisolone 300 mg PO in tapering dose for 9 days. Mare was observed for clinical recovery which was evident by disappearance of fever and normal urine colour by third day. The blood sample was sent for laboratory evaluation on 4th day post treatment. The TLC count got reduced to 28,303/µl and no clumping was evident on smear examination.

Mare was discharged and therapy was continued up to 9 days. On telephonic conversation, owner revealed that after completion of treatment, animal was healthy and taking feed and water normally.

Discussion

The history, clinical and clinic-pathological findings in the present case were consistent with IMHA secondary to bacterial infection indicated by profound leukomoid response along with severe neutrophilia. It directly points towards the fact that some primary disease process might be going on in the animal which might have led to inappropriate antibody production against RBCs antigens (Peek, 2010). Secondary IMHA due to bacterial infection has also been reported in horse previously (Weissand Moritz 2003; Sellon 2004; Cottle and Hughes 2010). Diagnosis of IMHA in the present case was made on the basis of history, clinical findings and clinico-pathological data along with positive

direct comb test which is usually seen as an essential test for the work up in any suspected case of IMHA (Peek 2010). Nevertheless, more confirmatory diagnosis can be made through flow cytometry for erythrocyte antibodies which was not required in present study due to therapeutic improvement of case after initiation of therapy. Therapeutic management of IMHA involves supportive therapy and treatment of underlying causes. Similar to our results, Weiss and Moritz (2003) used corticosteroid to successfully manage clostridial induced IMHA. However, previous studies conducted by Sellon (2004) and Cottle and Hughes (2010) recommended to avoid use of steroids in IMHA or use them with caution especially while addressing some infection. Moreover, frequent blood work should be undertaken to monitor improvement in PCV and evaluate regeneration in such cases before discontinuing therapy.

Conclusion

It was concluded that microscopic examination and insaline agglutination test can be used in field conditions to diagnose secondary IMHA. Corticosteroid therapy along with removal of cause responsible for IMHA is an effective treatment for IMHA.

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Corrigendum

The name of one author in the following article which was published in 2018 appeared as Kalaiselvan, P. instead of Kailaiselvan, E. It should be read and mentioned in the reference as Kalaiselvan, E.

Reetu, Hoque, M., Saxena, A.C., Pawde, A. M., Kalaiselvan, E. and Dey, S. (2018). Incidence of cardiac diseases in dogs. *Indian J. Vet.* Med. 37(1&2): 64-67.