STUDIES ON THERAPEUTIC EFFICACY OF FRESH AND STORED BLOOD TRANSFUSION IN CLINICALLY ANAEMIC CANINES

Anil Kumar and S. Haque

Department of Teaching Veterinary Clinical Complex

Bihar Veterinary College, Patna-800014.

Email: dranilvet95@gmail.com

Received 26-6-2013 Accepted 20-8-2013

ABSTRACT

25 clinically anemic canines randomly divided into 5 equal groups were studied. Group T_5 was treated as control group, T_1 was transfused with fresh blood and T_2, T_3, and T_4 with 7, 14 and 21 day preserved blood respectively. The hematology showed significant decrease in hemoglobin, PCV, total erythrocyte count and mean corpuscular hemoglobin concentration. But on 24, 72 and 120 hours post blood transfusion, a significant increase in the hematological parameters approaching to normal values were observed; where as no significant improvement was noticed in anemic control group treated with single i.m iron dextran injection.

KEY WORDS : anorexia, anemia, blood transfusion, hemoglobin and packed cell volume.

INTRODUCTION

Blood transfusion is one of the most effective biotherapeutical procedures for different forms of life threatening anemia. Effect of anemia is so serious that in absence of proper management the animal die soon. It is indicated in situation where packed cell volume (PCV) is less than 15% and hemoglobin concentration below 5 gm% (Nalini, 1993 and Tufani et al. 2004), in order to replace both oxygen carrying capacity and oncotic activity.

Therefore, the present study was conducted to study the effect of fresh and stored blood transfusion in clinically anemic canines.

MATERIALS AND METHODS

Present study was carried out with 25 clinical cases of age group 3-4 months. Pups were screened for anemia under field conditions and the clinical cases were selected on the basis of their hemoglobin level and clinical symptoms and were maintained in the department of medicine for conducting experiment. The major signs of anemia exhibited by animals were pale mucous membranes, dullness, tachycardia, tachypnoea, partial anorexia, weakness and rough hair coat.

Animals were divided into 5 groups randomly consisting of five (n=5) animals in each group. Group T_1 was transfused with fresh blood@ 20 ml/Kg body weight as a single therapy, while Group T_2, Group T_3 and T_4 were transfused with stored blood maintained at 4-6^{oC} for 7,14,and 21 days respectively @ 20 ml/Kg body weight as a single therapy. Group T_5 was maintained as control and treated with single iron dextran injection @ 10 mg/Kg body weight intramuscularly. 5 ml of blood was collected from each pup of all the five groups before and after transfusion of blood for hematological analysis as per standard methods.

RESULTS AND DISCUSSION

The mean hemoglobin (Hb), packed cell volume (PCV), total erythrocyte count (TEC), mean corpuscular hemoglobin concentration (MCHC) were recorded as 12.44±0.31gm/dl, 40.00±1.29%,6.25±0.21x10^6 /cumm and 31.21 ±0.52 gm% respectively in donors before collection of blood into CDP-A collection bags.

The hematological data presented in the table revealed that hemoglobin (Hb) concentration, Mean packed cell volume (PCV) and mean total erythrocyte progressively increases with advancement of time in all the four treated blood groups. However, significantly lowest value of these parameters was recorded at 0 hour as compared to 24, 72 and 120 hour post blood transfusion, but the difference among later three periods were not significant . Similar findings were also reported by Joshi *et al.* (2003), Saini *et al.* (2005), Quazi *et al.* (2012), Ingole *et al.* (2012), Ognean *et al.* (2010) and Sufin *et al.* (2001). This might be due to direct effect of blood transfusion and erythropoietic activity in increasing the hemoglobin concentration. Non-significant but progressive improvement in hemoglobin concentration due to iron dextran in control group T_5 revealed that intramuscular injection of organic iron preparation gives less rapid but prolonged results in the treatment of anemia.

Table: 1 Haematological values of different treatment at different time interval after blood transfusion.

Parameters	Group	Before blood transfusion	Post blood transfusion		
		0 hour	24 hour	72 hour	120 hour
Hemoglobin concentration (gm/dl)	T_1	5.54±0.39^a	8.32±0.62^b	8.50±0.54^b	8.74±0.57^b
	T_2	5.48±0.37^a	8.06±0.70^b	8.34±0.66^b	8.58±0.63^b
	T_3	5.80±0.24^a	8.18±0.38^b	8.36±0.34^b	8.60±0.34^b
	T_4	5.70±0.24^a	8.00±0.35^b	8.32±0.29^b	8.56±0.42^b
	T_5	5.56±0.22^a	6.08±0.24^a	6.28±0.20^a	6.32±0.22^a
Packed cell volume (%)	T_1	19.60±1.28^a	27.20±1.28^b	28.00±1.51^b	29.80±1.28^b
	T_2	19.00±1.14^a	26.20±2.13^b	27.20±1.98^b	28.40±2.06^b
	T_3	20.20±1.11^a	26.40±1.03^b	27.40±1.32^b	28.40±1.20^b
	T_4	19.80±1.02^a	25.40±1.16^b	26.40±1.12^b	27.80±1.28^b
	T_5	18.60±0.81^a	20.00±0.70^a	20.40±0.74^a	21.40±0.74^a
Total erythrocyte count (10^6/cumm)	T_1	3.48±0.22^a	4.46±0.19^b	4.52±0.19^b	4.63±0.18^b
	T_2	3.40±0.17^a	4.30±0.21^b	4.39±0.19^b	4.46±0.20^b
	T_3	3.58±0.20^a	4.30±0.12^b	4.36±0.12^b	4.46±0.10^b
	T_4	3.60±0.20^a	4.28±0.14^b	4.36±0.19^b	4.44±0.22^b
	T_5	3.57±0.19^a	3.66±0.19^a	3.71±0.17^a	3.81±0.16^a
Mean corpuscular hemoglobin concentration(gm %)	T_1	28.22±0.59^a	30.66±0.74^b	30.28±0.38^b	30.26±0.49^b
	T_2	28.94±0.45^a	30.74±0.42^b	30.62±0.52^b	30.20±0.30^{ab}
	T_3	28.74±0.69^a	30.98±0.46^b	30.54±0.25^b	30.30±0.23^b
	T_4	28.61±0.58^a	31.50±0.32^b	31.28±0.19^b	30.81±0.34^b
	T_5	29.91±0.54^a	30.40±0.69^a	30.80±0.49^a	30.19±0.19^a

The MCHC value increased at the three treatment period after blood transfusion, although the increase was non significant in all the groups including T_5. This finding correlates with findings of Joshi *et al.* (2003) and Ingole *et al.* (2012) which might be due to direct effect of transfused erythrocytes brought into circulation. During study, no adverse reaction was noticed.

From the present study, it can be concluded that fresh and stored whole blood transfusion leads to significant improvement in clinico- hematological parameters and thus might be equally effective in therapeutic management of anemia in canines.

REFERENCES

Ingole, K.H.; Keskar,D.V.; Gaikwad,R.R. and Sawale,G.K.(2012). Studies on blood transfusion in canines. *Indian Vet. J.,* **89 (6):***122-123.*

Joshi, S.A; Rajguru, D.N.; Rane, R.S.; Saleem,M. and Miss, G.S Shastri (2003). Efficacy of blood transfusion in experimental anaemia in dogs. *Indian Vet. Med. J;* **23(2)**:106-107.

Nalini, K. (1999). Blood transfusion in canines. *Pet India,* **5 (1):** 15.

Ognean, L. ; Moldovan, M.M.; Cernea, C. and Morar,I. (2010). The evolution of some safety and efficacy parameters in dog whole blood transfusion therapy. *Lucrari Stiintifice Medicina Veterinara;* **XLIII (1)***: 345-350.*

Quazi , J.A; Kachwaha,K; Parasar, M.C; Palecha, S. and Gahlot, T.K. (2012). Clinical Management of Ailments with Blood Transfusion in Canines. *Intas Polivet;* **13 (1)**: 89-91.

Saini, N; Dua, K; Randhwa, S.S; Singh, R and Uppal, S.S. (2005). Effect of blood transfusion on clinic-hematological parameters in anemic dogs. *I.J.V.M*. **25 (1)**:1-3.

Sufiun, M.A., Hussain, M.A. and Aziz, S.A. (2001). Effect of blood transfusion in calves. *Bangladesh Vet.,* **18 (1)**: 9-13.

Tufani, N.A; Shekhar, P; Haque, S; Kumar, P. and Thakur, S.K. (2004). Blood transfusion in anemic dog and its management. *Intas Polivet* **5:** 100-02.

❑