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Preliminary clinical observation following intravenous blood transfusions in Ovines

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ABSTRACT

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Preliminary clinical observations were carried out following intravenous blood transfusions in sheep. Twelve (12) adult sheep were used, six (6) as donors and six (6) as recipients. Blood was collected via venepuncture using commercial blood bags used for humans. The collected blood was immediately transfused to the recipients; observations for clinical signs, reactions, and vital parameters were recorded. Repeat intravenous transfusions were also conducted and similar clinical observations were conducted. Reactions observed in recipient include Hyperthermia, Hyperthermia tachycardia, hyperpnoea and anorexia. A mean increase of 7.83 cycle/min and 3.83 was observed for respiratory rate, heart beat rate and packed cell volume respectively. A mean decrease in temperature of -3.6^oc was observed in the recipients. No mortality was recorded aside from those clinical observations.

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1. Introduction

Blood is a slight alkaline fluid which serves as a carrier of nutrient to all over the body. Gaseous exchange within the soft tissue, Neuro-endocrine activity, thermoregulation and engage in defense activity as well as

maintaining of tissue pH. (Marcks manual, 2005). These are known to consist of a fluid portion or plasma in which blood cells (RBC, WBC and platelets) are suspended (Gigar et al., 1995). Frequently, the need for blood transfusion is acute, as in acute haemolysis is hemorrhage, transfusions are also appropriate in the treatment of acute or chronic anemia, as in replacement of blood loss caused by accident, hemorrhage, shock of plasma substituted (Cynthia et al., 2005).

According to Bodon, (2001), a health blood donor amount of the same species is required during blood transfusion and up to 10% of the blood volume can be taken without ill effect i.e. 10% of the donor body weight (100ml for 10kg). Adverse reaction due to incompatible blood type is rarely seen in ruminant (Red Sokoto goat). According to Karl et al., (1993), lack of commercially available blood typing reagents makes complex typing and matching difficult. The most serious risk of transfusion is acute haemolysis, but this should not preclude the clinical use of transfusions. Repeated blood transfusion may be a serious problem associated with delayed haemolysis seen clinically as shortened survival if transfused RBC (Hale, 1995).

Other complications analyses by Vamvakes and Blajchaman (2001) include sepsis from contaminated blood, hypocalcaemia from too much citrate hypervolaemia fever, are also seen occasionally. Transfusion may also spread disease from donors to recipients such as RBC parasites, viruses and bacterial pathogens if the donors harboring the pathogens. The practice of blood transfusion in animals for therapeutic purposes is relatively of recent origin but has a long history (Learoyd, 2006). The use of blood for this purpose may be medicinal. The practice of blood transfusion in domestic animals in Nigeria is seldom, there is an increase need for the practice of blood transfusion in our domestic animals due to high percentage of death as a result of post-partum haemorrhage and severe anemia recorded.

The process of blood transfusion will therefore greatly contribute to availability of the good reproduction health; boost the economy of farmers thereby reducing loss of animals as a result of the above mentioned conditions. Blood transfusion in animals in the area of study has not been reported, this work is likely the first of its kind. It has been performed elsewhere, majority in small animals i.e. dog and cat. According to literatures (www.thehindv.com)

In ruminant blood transfusion according to literatures, blood cross matching is only rarely performed all that is advisable is to inject 200ml of donor blood to the adult recipient and wait for 10 minutes if no reaction occurred the rest of the blood can probably be safely administered, adverse reaction is more commonly seen in very young animals or pregnant cattle's (www.doctorslounge.com).

2. Materials and methods

Twelve adult Sokoto red goats of either sex were used for this study. The goats were purchased from Sokoto market with ages ranging from 10-12 months and body weight ranging between 25-30kg. They were fed on bean haulm, wheat bran with fresh tap water. They were kept for 20 days. Before the commencement of the experiment in order to stabilize and acclimatize with the environment. During this period, a prophylaxis antibiotic along with deworming of the animals was incorporated.

- Blood samples taken using EDTA bottles for PCV
- The animals were divided into two groups of 6 each i.e. 6 donor and 6 recipients.
- The donors were physically restrained and jugular vein was prepared aseptically with savlon and razor blade was used for shaving the area.
- Commercial blood bags were prepared with 18g hypodermic needle was inserted via the jugular vein.
- The quantity of blood depends on the weight of the animal i.e. 10% of the blood volume can usually be taken without any effect i.e. rough guide of 1% of the donor body weight i.e. 100ml for 10kg as reported by Boden (2001).
- Samples were stored in the refrigerator for a period of two days before administration. Before administration the PCV were taken and were also warmed to body heat before administration according to Boden (2001).
- The recipients were prepared and mildly sedated, the site of choice for the transfusion was the cephalic vein

Materials used include: Butterfly needle, Given set and Adhesive tape

The animals were observed for any possible reaction with record taken at every stage. Clinical observation during and after intravenous blood transfusion were conducted.

3. Results and discussion

From the result, the increase in temperature of about 5-10°C by the recipient goats is likely due to an introduction of new substances into the circulation of the animals which is explain by the work of (Smith, 1991). It was observed during the work that there was an increase in PCV after the transfusion (significantly 5-10%) it is therefore expected as appreciable amount of blood i.e. not less than 200ml per goat was transfused compared to the literature, a transfusion rate of 10-20ml/kg recipient weight is necessary to result in appreciable increase in PCV (www.ddocctorslounge.com) other observation in the course of this work include salivation, lacrimation, coughing, urination and hiccupping. And after transfusion, the animals were highly pyretic with an increase of 5-15°C of body temperature. This signs were also among the reactions seen in the literature. Though there were more reactions which include hematuria, heamogloburiamia, collapse opisthionus, muscle tremors etc (www.thehindu.com).

Table 1

Showing grouping, aging and body weights of the donor and the recipient

Donor	Age (month)	Wt(kg)	Recipients	Age (month)	Wt(kg)
D1	11	27	R1	10	28
D2	10	28	R2	10	29
D3	10	30	R3	11	30
D4	12	30	R4	12	30
D5	11	29	R5	12	29
D6	12	29	R6	12	28

Table 2

Shows the record of PCV level and vital parameters of goat (donors) before and after sampling were taken

Group	PCV (%)	T Before	T after
D1	28	37.6	37.2
D2	31	37.9	37.0
D3	31	37.5	36.8
D4	29	37.9	36.4
D5	31	37.6	36.2
D6	28	37.7	37.0

Key: PCV=Pack cell volume

T^o= Temperature

Table 3

PCV levels and vital parameters of recipients before and after transfusion.

Group	PCV (%) before	PCV (%) after	T ^o Before	T ^o after	Heart rate Before	Heart rate after
R1	21.0	37.0	37.6	47.0	40.0	54.0
R2	24.0	29.0	37.8	40.6	44.0	57.0
R3	20.0	29.0	37.0	46.0	62.0	66.0
R4	24.0	28.0	37.2	46.5	60.0	65.0
R5	24.0	35.0	38.2	40.5	64.0	67.0
R6	28.0	34.0	38.8	45.3	53.0	66.0

Key: PCV=Pack cell volume

T^o= Temperature

All the later reactions listed were not observed in the course of the work. The drop in temperature of the donors after blood collection were not reported elsewhere, the increase in temperature of the recipient after transfusion is in accordance with the observation of Learoyd (2006) and Harrell *et al.*, (1997). Finally, a significant success of the work as an increase observed in PCV of recipients, successful procedure were practicable and clinical observation were mild, so also there was no abnormal reaction of hemolytic or non hemolytic types. Several animals were successfully transfused with blood in the course of surgery at UDUVTH. It is therefore recommended that the diet of blood transfusion should be practice due to its positive contribution to animal health. Further investigation is therefore required or more successful transfusion in animals.

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