

# THE INCIDENCE OF TRYPANOSOMIASIS IN THARI CAMELS AND EFFICACY OF VARIOUS DRUGS

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**ABSTRACT:** The present study was carried out to determine the incidence rate of the Trypanosomiasis in Thari camels and observe the efficacy of various antiprotozoal drugs. Five hundred camels were observed for the identification of trypanosomiasis by using blood smears (three thin and three thick blood smears from each animal) prepared from different localities of district Therparker. The diagnosis was made on the basis of clinical signs and microscopic examination. All blood smears microscopic examinations revealed 123 positive cases of Trypanosomiasis with incidence rate of 24.6 %. To observe the efficacy of the various drugs, Thirty Two positive cases were selected and divided into four groups, Group A was treated with Suramin, Group B with Isometamidium chloride, group C was treated with the Diminazine di aceturate and group D was kept as control. All experimental animal were observed for clinical signs before and after the treatment. The treatment results showed that Suramin was the most effective drug curing 75% Trypanosomiasis cases, Isometamidium chloride and Diminazine di aceturate cured 50% and 37.5%, respectively. It was concluded that the Trypanosomiasis is endemic in camel's population of Therparker and it is needed to be controlled with the effective drug.

**Key Words:** Camel, Trypanosoma Evansi, incidence rate, Suramin, Isometamidium chloride, Diminazine-di-aceturate

## INTRODUCTION

Trypanosomiasis is a protozoal disease of domestic and wild animals worldwide, caused by Trypanosoma Evansi, the camel is considered major target infected species from trypanosomiasis [1, 2]. Clinically, disease occurs in acute or chronic form and may be sometimes fatal [3]. The disease is known as Surra locally, and is characterized by intermittent fever, progressive anemia, emaciation, edema of the dependent parts of the body, the other common clinical signs are including sweating, lacrimation, nasal discharge, hyper aesthesia, urticarial plaque formation on the skin, conjunctivitis, petechial hemorrhage, hindquarter muscles atrophy and posterior paralysis [4].

In camels, commonly trypanosomiasis occurs in chronic form, and is directly related to production losses including, reduction in milk, meat, drought power, in females sometime premature birth, abortion and infertility [5].

Therparker district is fertile desert area (Thar) of the Sindh province (Pakistan) comprises the large numbers of camel population. The camel is main source of transport, serving in the extreme hot weather and secrecy season. Camel not only plays an important role for socioeconomic development of the region, but fulfil the requirement of milk for local population. Trypanosomiasis is one of the most important Economical protozoal disease of camels. The poormanagemental condition and presence of the biting flies (vector) are the major contributing factor for the incidence of the Trypanosomiasis. Unfortunately, none of the planned study has been carried out to determine the incidence of Trypanosomiasis in Thari camels, in fact camels contribute the economic benefits for the farmers of this desert area. The basic diagnosis of trypanosomiasis is depending still on the examination of fresh and stained blood smears, and control depends on the accurate diagnosis of the disease at the initial stage of the infection and treatment with the effective drugs [6]. The goal of this study was to estimate the incidence rate of trypanosomiasis and observe the therapeutic effect of market available drugs in Thari camels.

## MATERIAL AND METHODS

### Experimental animals, collection of the blood and processing of blood samples

Five hundred camels (different ages and sex) were selected for the identification of trypanosomiasis from different localities of district Therparker. All the animals were observed clinically before the collection of blood samples, and each animal blood sample was collected aseptically from jugular vein. Three thin and three thick blood smear from each animal were prepared immediately and fixed in 100% Methyl alcohol and brought to laboratory for further process of Giemsa stain described by Soulsby [7].

### Identification of the Trypanosomiasis Infection

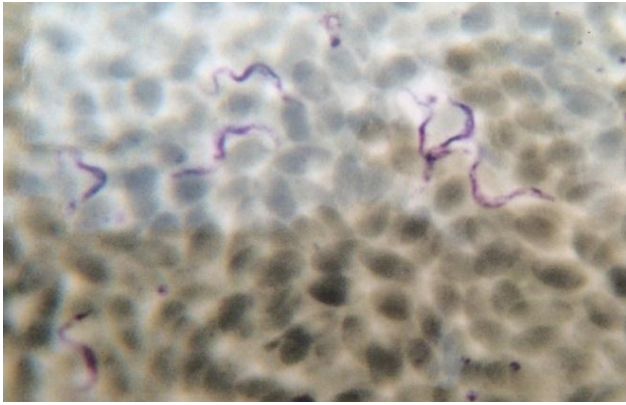
All Giemsa stained thick and thin blood smears were examined under binocular 100X objective lens for the diagnosis of Trypanosomiasis infection according to the procedure described by Soulsby [7].

### Antiprotozoal drug efficacy

Suramin, Isometamidium chloride and Diminazine di aceturate were selected to observe the efficacy against the Trypanosomiasis, All the selected animals were injected drugs under standard dose rate according to the manufacturer's instructions. After fifteen days of treatment, blood smears were again prepared and examined for the identification of trypanosomiasis infection and drug efficacy.

## RESULTS

Five hundred camels were examined for the presence of trypanosomiasis infection and only 123 camels were found positive, the highest incidence rate of infection was recorded with 67 (30.04%) positive cases from Gadhi-jo-Luck, and lowest incidence rate with 25 (19.68%) positive case from Hajaman-jee-dub as shown in the Table 1. The Trypanosoma Evansi was identified as causative parasite (Fig. 1).



**Fig. 1 Microscopic examination of Camel blood smear showing Trypanosoma Evansi**

Out of 123 positive cases thirty two animals were selected and divided into four groups comprising of 8 animal in each group. Group A was treated with suramin, Group B with Isometamidium chloride, Group C with Diminazine di aceturate and group D was kept positive control and treated with injection of buffer saline 0.9% 20 ml IV.

The blood smears were prepared after the fifteen days of treatment and examined for the efficacy of drugs. Suramin was the most effective drug with a cure rate of 75%, while Isometada chloride and Diminazine di aceturate cured 50% and 37.5%, respectively.

Table 2. Summarizes the sensitivity results of the various drugs used for the treatment of Trypanosomiasis. The findings of efficacy rate of Suramine, Trypamedium and Diminazine di-aceturate were observed 75%, 50% and 37.5%, respectively.

**Table: 1 shows localities and numbers of sample examined**

S. No:	Localities	No: of animal examined	Positive cases	Incidence rate (%)
01	Sawai	150	31	20.66
02	Hajaman- jee-dubi	127	25	19.68
03	Gadhi-jo- Luck	223	67	30.04
	Total	500	123	24.60

**Table -2. Microscopic examination results of different groups before and after the treatment with antiprotozoal drugs**

Group	Drugs	Dose rate and route of admin:	Selected animals	Positive animals*	Recovery (%)
A	Suramin	10mg/kg, (10%), IV	08	02	75%
B	Isometamidi- um chloride	0.5mg/kg, 1%, IM	08	04	50%
C	Diminazine di aceturate	3.5mg/kg, IM	08	05	37.5%
D	Controlled (buffer saline)	20ml IV	08	08	00.00

\* Trypanosoma Evansi Positive animals after the treatment

## DISCUSSION

The present study was designed to investigate the incidence of Trypanosomiasis and observe the efficacy of antiprotozoal drugs for the treatment of Trypanosomiasis in Thari camels. According to the observation of clinical signs and blood samples smear results, the over-all incidence rate of trypanosomiasis was found 24.6% (Table 1), and Trypanosoma Evansi (Fig: 1) was identified by as a causative parasite with the similar characteristics [7]. The incidence rate of trypanosomiasis was higher in Tharparkar as compared to Tehseen et al (2015) reported 0.7 % prevalence rate from 1005 camels from Cholistan desert, Pakistan [8]. In another study report by Abdel-Rady (2008), the prevalence rate was 10.3% (from 193) camels from Egypt [9], Salim et al (2011) reported the highest prevalence rate 57.1% (117/205) of trypanosomiasis in camels from Sudan [10]. The current results of trypanosomiasis vary due to seasonal variation of vector populations, general management condition, frequently usage of preventive drugs, different diagnostic techniques and stage of the disease at the time of diagnosis animals. In group A, Suramin resulted 75% by a single intravenous injection, the clinical sign of the disease disappear within five days, and all animals improved gradually. These results were observed similar with the findings of faccio et al (2013), that a single injection of suramin cure the 100% trypanosomiasis in mice [11], however drug resistance to trypanosoma evansi have been reported by Zhou et al. (2004) from China [12], and Payne et al. (1994) from Indonesia [13]. In group (B) Isometamidium chloride results were observed 50%, the clinical signs of the disease did not subside early, as fever decreased gradually in all recovered animals. These results were similar with Ahmed et al (2005), reported that induced trypanosomiasis in Albino mice single injection of Trypamedium did not cured 100% [14]. However, Subekti et al. (2015) reported that Isometamidium chloride was not recommended for the treatment of trypanosoma evansi isolates in Indonesia due to widespread drug [15], and the same results of drug resistance were observed from Philippine [16]. While in C group, efficacy results of Diminazine di-aceturate were not in agreement with the Akber et al, (1998) that Dimininc (Diminazine di-aceturate) had the highest rate of recovery, 66.66% (2 of 3) from trypanosomiasis [17], however, these results vary due to less number of animals treated or may be the species variation. However, Diminazine di-aceturate results suggest that it is not effective and drug resistance has been found in camels [3,18]. Control group (D) animals did not show any recovery and animals increased the severity in clinical signs during throughout the experimental period.

## CONCLUSION

It can be concluded that Trypanosomiasis is endemic in Thari camels, the Suramin may be used for the treatment of trypanosomiasis. Modern molecular techniques may be applied for the accurate diagnosis of trypanosomiasis in camels, new drugs may be tested for the better results to control the disease, prevent the drug resistance and economic losses.

## REFERENCES

- 1, Bengis R, Kock R , Fischer J., "Infectious animal diseases: the wildlife /livestock interface, *Revue Scientifique et Technique-Office international des épizooties*, **21**, 53-66 (2002)
- 2, Dirie MF, Wallbanks K, Aden AA, Bornstein

- S , Ibrahim M., Camel trypanosomiasis and its vectors in Somalia, *Veterinary parasitology*, **32**, 285-291(1989)
- 3, Desquesnes M, Dargantes A, Lai D-H, Lun Z-R, Holzmuller P, Jittapalpong S., Trypanosoma evansi and surra: a review and perspectives on transmission, epidemiology and control, impact, and zoonotic aspects,*BioMed res:inter*, (2013)
  - 4, Abo-Shehada MN, Anshassi H, Mustafa G, Amr Z., Prevalence of Surra among camels and horses in Jordan, *Pre: veter:med.*, **38**, 289-293 (1999)
  - 5, Gutierrez C, Corbera J, Juste M, Doreste F, Morales associated with Trypanosoma evansi infection in camels in the Canary Islands, *Veterinary Parasitology*, **130**, 163-168 (2005)
  - 6, Dia M, Diop C, Aminetou M, Jacquiet P, Thiam A., Some factors affecting the prevalence of Trypanosoma evansi in camels in Mauritania, *Veterinary parasitol.*,**72**,111-120 (1997)
  - 7, Soulsby, E.J.L., *Helminths, Arthropods and Protozoa of Domesticated animals*, 7th edn.(ELBS), Bailliere Tindal, London, (1982)
  - 8, Tehseen, Sonia, Nusrat Jahan, Muhammad Fiaz Qamar, Marc Desquesnes, Mirza Imran Shahzad, Stijn Deborggraeve, and Philippe Büscher., Parasitological, serological and molecular survey of Trypanosoma evansi infection in dromedary camels from Cholistan Desert, Pakistan, *Parasites & Vectors*, 8(1), 1(2015)
  - 9, Abdel-Rady, Ahmed., Epidemiological studies (parasitological, serological and molecular techniques) of Trypanosoma evansi infection in camels (Camelus dromedarius) in Egypt, *Vet:World*, 11(1),325-328(2008)
  - 10, Salim, Bashir, Mohammed A. Bakheit, Joseph Kamau, Ichiro Nakamura, and Chihiro Sugimoto., Molecular epidemiology of camel trypanosomiasis based on ITS1 rDNA and RoTat 1.2VSG gene in the Sudan”*Parasites & vectors*,4(1),1 (2011)
  - 11, Faccio, Luciana, Aleksandro S. Da Silva, Lucas T. Gressler, Alexandre A.Tonin, Cícera R. Lazzarotto, Luiz Claudio Miletti, and Silvia G. Monteiro., Susceptibility of Brazilian isolates of Trypanosoma evansi to suramin sodium: Test in experimentally infected mice, *Exp:para.*,134(3), 309-312 (2013)
  - 12, Zhou, Jinlin, Jie Shen, Dangjin Liao, Yongzhi Zhou, and Jiaojiao Lin., Resistance to drug by different isolates Trypanosoma evansi in China." *Acta Tropica*, 9(3), 271-275 (2004)
  - 13, Payne RC, Sukanto IP, Partoutomo S, Jones TW., Efficacy of cymelarsan treatment of Suramin resistant Trypanosoma evansi in cattle, *Tropical animal health and production*, 26(2), 92-94(1994 Jun 16)
  - 14, Ahmad, S., A. A. Nasir, and A. H. Awan., Therapeutic drug trial in albino mice against Trypanosomiasis, *Pakistan Veterinary Journal*, (2005)
  - 15, Subekti, Didik Tulus, I. Yuniarto, H. Susiani, F. Amaliah, and B. Santosa., Trypanocidals effectivity against some isolates of Trypanosoma evansi propagated in mice, *Indonesian Journal of Animal and Veterinary Sciences*, 20(4), (2015)
  - 16, Macaraeg, Bryan B., Jonathan V. Lazaro. Nancy S. Abes, and Claro N. Mingala., In-vivo assessment of effects of trypanocidal drugs against the Trypanosoma evansi isolates from Philippine water buffaloe (Bubalus bubalis), *Veter: arhiv*, 83(4),381-392 (2013)
  - 17, Akbar SJ, Munawar G, Ul-Haq A, Khan SM, Khan MA., Efficacy of ryanocidal drugs on Experimentally induced trypanosomiasis in racing camel, *J Protol Research*, 8, 249 -252 (1998)
  - 18, Gutiérrez, C., González-Martín, M., Corbera, J. A., &Junco, M. T. T., Chemotherapeutic agents against pathogenic animal Trypanosomes, *Microbial pathogens and strategies for combating them: science, technology and education (Méndez-Vilas A, editor)*. Formatex Research Center, Spain, 564-1573(2013)