Short communication:

Lack of Evidence for Infection of Camels with tick-borne Diseases in Riyadh Region, Saudi Arabia

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الملخص

أجريت هذه الدراسة للتحقيق في إصابة الإبل بالأمراض المنقولة عن طريق القراد و هى الثيلرية و البابيزيا و مرض المثقبيات. لهذا الغرض جمعت 77 عينة دم من الإبل فى منطقة الرياض ، المملكة العربية السعودية. تم تطبيق إختبارات التفاعل الإنزيمى المتسلسل بإستخدام بادى تفاعل محدد لكل طفيل. من المثير للاهتمام، لم يتم العثور على حيوان إيجابي لأى من الأمراض المنقولة عن طريق القراد و هى الثاليريا و البابيزيا و الأنابلازما. من ناحية أخرى، خمس من الإبل سجلت حالات إيجابية لمرض المثقبيات (6.5 %). هناك حاجة إلى مزيد من الدراسات لحقيقة تقارير أخرى تشير إلى إصابة الجمال بالثيلرية في المملكة العربية السعودية

Summary

This study was conducted to investigate infections of camels with tick-borne diseases, namely *Theileria*, *Babesia* and *Anaplasma*, and *Trypanosoma evansi*. For this purpose, a total of 77 blood samples was collected from camels in Riyadh region, Saudi Arabia during February–April 2013. Specific PCR tests were applied for each parasite. Interestingly, no animal was found positive for the genus *Theileria*, *T. annulata*, *Babesia bigemina* and *Anaplasma marginale*. On the other hand, five camels were found positive for *Trypanosoma evansi* infection (6.5%). Further studies are needed to verity previous reports indicating infection of camels with *Theileria* spp.

Theileria camelensis is the only species of *Theileria* recorded from the camel and has been reported from Turkestan, USSR, Egypt and Somalia (Barnett, 1977). Reports of *T. camelensis* were based on the presence of the piroplasm stage inside the erythrocytes in Romanowsky-stained blood smears. The lack of any description of schizont stages, however, calls into doubt on the validity of the taxonomic status of *T. camelensis* and led Wenyon (1926) to suggest that the parasite might be *Babesia equi*. The recent evidence for exoerythrocytic schizogony of *Babesia equi* transmitted by *Hyalomma anatolicum* (Schein *et al.*, 1981) indicates that this parasite may be a *Theileria*. Furthermore, the presumed vector of *T. camelensis, Hyalomma dromedarii,* has been shown to be capable of transmitting the bovine parasite *T. annulata* (Bhattacharyula *et al.*, 1975; Ashmawy, 1981). The exact speciation of *Theileria* parasites reported from the camel may be in doubt. Attempts, however, to infect camels in Kenya with *T. lawrencei*, the causative agent of corridor disease in bovines had failed (Evans and Powys, 1979).

There appears to be no report that describes infection with *T. camelensis* as pathogenic to camels, although Barnett (1977) reported a fatal case in a member of the Camelidae (aIlama) in an Egyptian zoo.

The only report of *Anaplasma* infection in camels, in addition to those cited by Rutter (1967), is that from Somalia in which *Anaplasma* bodies were found in erythrocytes in 13 out of 293 blood samples collected from camels in Kismayo region (Anon, 1981).

This study was conducted to investigate infections of camel with tick-borne diseases, namely *Theileria*, *Babesia* and *Anaplasma*, and to determine *Trypanosoma evansi* infection in camel in Riyadh region, Saudi Arabia during February–April 2013.

Seventy-seven blood samples were collected from camel in Riyad region during February – April 2013. These camels were from indigenous breeds. Forty samples were collected during February, 12 in March and 25 in April 2013. All camels were juvenile males.

DNA extraction was done using Qiagen mini extraction kit (Qiagen, Germany). PCR for *Theileria* genus, *Theileria annulata*, *Anaplasma marginale* and *Trypanosoma evansi* was performed according to Allsopp *et al* (1993).

Although many reports and documentations are available concerning *Theileria annulata* infection in cattle, few reports exist on tick-borne diseases infection in camels. This communication is intended to provide more insight into this poorly studied subject. In spite of the fact that, *T. camelensis* was reported in camel in Egypt (Hamed *et al.,* 2011), it is not possible to support that finding by detecting *T. annulata* in this limited study. Nevertheless, specific primers and highly purified camel DNA were used. In an attempt to demonstrate tick-borne diseases other than *Theileria,* PCR assays for *Babesia bigemina* and *Anaplasma marginale* were applied. Again, no sample was found positive for any studied parasite.

The detection of *Trypanosoma evansi* in these samples was not surprising, since this pathogen is the most important protozoan parasite of the camel, which causes severe disease throughout Africa and Asia (Boid *et al.*, 1985; Al-Khalifa *et al.,* 2009).

These results have confirmed that camels are not infected with any of the tick-borne disease studied; however, several reports stated that, camels were infected with *Theileria*. A statement which may need to be confirmed by further molecular technique or it could be false positive results that need to be re-examined.

References

Allsopp, B.A.; Bayliss, H.A.; Allsopp, M.T.E.P.; Cavalier-smith, T.; Bishop, R.P.; Carrington, D.M.; Sohanpal, B. and Spooner, P. (1993). *Parasitology***, 107:** 157-165.

Al-Khalifa, M.S.; Hussein, H.S.; Diab, F.M. and Khalil, G.M. (2009). *Saudi J. Biol. Sci.*,**16**: 63–67

Anon (1981). Annual report of the Veterinary Laboratory, Kisimayo. Somali Democratic Republic. Ministry of Livestock, Forestry and Range, Department of Veterinary Services.

Ashmawy, K. (1981). Inaugural dissertation, TierartzlicheHochschule, Hannover.

Barnett, S.F. (1977). In: Kreier, J.P. (ed.) *Parasitic Protozoa*. Vol IV, New York Academic Press.

Bhattacharyula, Y.; Chaundri, R.P. and Gill, B.S. (1975). *Parasitology*, **71**: 3.

Boid, R.; Jones, T.W. and Luckins, A.G. (1985).*Br. Vet. J.*,**141**:87-104.

Evan, J.O. and Powys, J.G. (1979). In IFS provisional reports No 6, Camels, p. 242. Stockholm; International Foundation for Science.

Hamed, M.I.;Ahmed, M.A.; Taha Z.; El-Allawy, A.A. and Mourad, M.I. (2011). *J. Adv. Vet. Res.*,**1**: 4-7.

Rutter, T.E.G. (1967).*Vet. Bull.*,**37**: 611.

Schein, E.; Rehbein, G.; Voigt, W.P. and Zweygarth, E. (1981). *Z. Tropenmed. Parasitol.*,**32**: 227-233.

Wenyon, C.M. (1926). *Protozoalogy*, Vol. II. A manual for Medical Men, p. 1011. London: BailliereTindall and Cassell Ltd.