ANTIBODIES TO MAEDI-VISNA IN INDIGENOUS SHEEP IN EASTERN TURKEY

B.E.C. SCHREUDER (*) A.D. YONGUÇ (**) H. GİRGİN (***)
A. AKÇORA (**)

ÖZET

Erzurum bölgesinde, ithal koyunlarda Maedi-Visna antikorunun tesbit edilmesi üzerine bu bölgede yerli koyunlarda aynı hastalığın varlığını araştırmak üzere serolojik çalışmalar yapıldı. Bu araştırma süresinde 14 ayrı bölgeden 198 adet koyun serumunda CTB-ELISA metoduyla Maedi-Visna virusuna karşı antikor arandı. Bu serumlardan yalnız 3 tanesinde antikor tesbit edildi (% 1.5). O bölgede 1970 yılında Merinos koçlar kullanılarak bir sun'i tohumlama projesi uygulanmıştı. Bununla beraber yerli ırk koyunlarda bu hastalık tesbit edilmedi. Muhtemel neticeler ve hayvancılığı geliştirecek projeler konu edildi.

SUMMARY

Because of the recent demonstration of Maedi Visna virus infection in imported sheep in Turkey, a serological survey was conducted in the Eastern Anatolian province of Erzurum, in order to assess the possible spread of the virus in the local sheep population. During this survey 198 sheep sera from all fourteen districts of the province were tested in a CTB-ELISA for antibodies against Maedi-Visna virus. Only three (1.5 %), originating from one district,

(*) Dept. of Herd Health and Pathology, Central Veterinary Institute, P.O. Box 65, 8200 AB Lelystad, The Netherlands.
(**) Etlik Hayvan Hast. Araşt. Enst. Viroloji Lab. Şefi.
(***) » » » » » Patoloji Lab. Şefi.

were positive. In this particular district an AI-project has been implemented in the 1970s, using Merino rams. It is concluded that the original indigenous sheep population is still free from this disease. Possible implications for ongoing and future livestock development projects are discussed.

INTRODUCTION

Ovine lentivirus (OLV) infections, exemplified by Maedi Visna virus (MVV) and ovine progressive pneumonia virus (OPPV), have, in recent years been found responsible for various pathological conditions, including a chronic progressive interstitial pneumonia. OLV-infections occur in many countries of the world, including most Western European countries where they had a considerable economic impact. The world wide spread of this disease - Oceania is reportedly the only area free from this infection - has paralleled the intensification of the sheep industry and the consequent importation of foreign breeds.

Turkey is no exception to this phenomenon. Just recently the first clinical, pathologically confirmed cases of MVV infection in Turkey were described (Girgin et al., 1987). In 1985 imported German Fleisch-Merino's were incriminated in these cases. The only other reference to MVV in Turkey comes from Alibaşoğlu (1975), who reported gross lesions suspect of Maedi in 0.02 % of slaughtered sheep in various major cities in the country. What sheep breeds and what regions were involved in these cases was not specified.

To investigate whether the indigenous sheep in Turkey were still free of this infection, the present survey was initiated.

MATERIAL AND METHODS

The area : Erzurum province is over 25,000 square kilometers in area. It is divided into 14 districts and generally considered to be among the least developed regions of Turkey. Livestock, especially sheep, are a major source of income in Erzurum province,

where animal husbandry and management techniques date back to ancient times. Foreign breeds have been imported only in the last two decades but not in substantial numbers. Some government - sponsored livestock development projects have tried to introduce into the area exotic breeds, mainly German Merino, but their impact has been extremely limited. Thus, Erzurum flocks are still representative of the indigenous sheep population of Turkey.

Collection of samples : As a rule samples were collected at two different locations in each of the fourteen districts of the province ,in each case involving at least two different flocks. Collection took place during two periods of approximately two months each, on in the summer of 1986, the other in the spring of 1987.

Sera were collected from adult female sheep, most of them having lambed twice or more. Almost all sheep were of the Mor - karaman (Red Karaman) breed, which is predominant in the area. Only in two collection places were other breeds involved: in one case (Palandöken mountains) samples were collected from Ak-karaman (White Karaman) sheep, belonging to transhumant livestock owners, who originated from the Tunceli district. Additionally, five samples were collected from Merino sheep or their crosses (Savaşçılar, Narman district).

Laboratory examination : Sera were separated the day after collection and stored at -20°C at the Erzurum Veterinary Laboratory, awaiting transportation by air to the Central Veterinary Institute in The Netherlands. Most of the samples were still solidly frozen on arrival. The sera were subsequently examined for the presence of MVV antibodies with a complex-trapping-blocking-ELISA (CTB-ELISA), as described by Houwers and Schaake (1987).

RESULTS

Of the 198 sera that were collected from all fourteen districts of Erzurum Province, all but three were negative in the CTB-ELISA for MVV antibodies (Table 1). The three positive sera came from two villages located in one district (Karayazı district).

DISCUSSION

In the 1986 survey, the only positive samples found were from the two above-mentioned villages in the Karayazi district. For this reason these two villages were included in the 1987 sampling as well. In the 1987 survey, the only positive case originated, again, from one of these two villages. Karayazi district happens to be the highest situated district in Erzurum province, with an extremely long winter period. No crossbreeding with exotic breeds was observed in either of the two villages. According to the local livestock owners, however, a short-lived artificial insemination project had been conducted in the region, in the early 1970s using Merino-rams. Specifically mentioned was the village of Ashar Söylemez, which is situated 30 kms from one of the affected villages and 50 kms from the other. Although the farmers claimed that no influx of outside stock had occurred, the nearby AI-project may very well explain these positive cases. Vertical transmission is unlikely, since the virus is apparently not transmitted via semen (Dawson 1987). It is likely, however, that the utilised breeding rams were distributed in the area on completion of the project thus enabling horizontal transmission through direct contact.

Horizontal transmission in MVV may not be very efficient but in Eastern Turkey with its prolonged winter-housing together with the indoor-lambing and a communal grazing system, the rate of increase of the infection by horizontal transmission will be at least comparable with developments in Iceland. In the latter country the introduction of MVV proved to have had a disastrous effect (Pálsson 1976). A difference in breed-associated susceptibility may mitigate this effect for Turkish conditions.

The economic effects of MVV reach beyond direct of indirect succumbing to the well-known respiratory from, and the loss of bodyweight in the advanced chronic cases. Recent research has focussed increasingly on udder changes caused by OLV infections. An indurative interstitial mastitis, histologically comparable with the lung lesions found in the respiratory form, has been found (Van der Molen et al.1985, Cutlip et al. 1985, Houwers et al. in press). Although exact figures on the effect of MVV on milk production

are unavailable they are estimated to be considereble (Houwers, in press). In Turkey, where milk production is not just meant for lamb rearing (sheep supply over 20 % of the country's demand for milk and milk products) this effect on milk production could over time become the most serious economical aspect of MVV. In this survey exotic breeds could not directly be incriminated, apart from a possible link with a former A.I.-procet. The study, however, indicates that the indigenous sheep population was basically free of MVV. The demonstration of positive reactors in a fairly remote area of the Eastern-anatolian province of Erzurum also shows that intraduction of the disease into Turkey must have taken place prior to the 1985-imports in Ankara region.

Total eradication of the disease at the present low rate of infection would be technically possible but will be hampered by economic and logistic restraints. We therefore recommend that, in addition to testing sheep on statefarms and livestock improvement centres, all exotic breeding stock introduced through ongoing or future livestock development projects should originate from confirmed MVV-free («accredited») flocks. If not, it remains to be seen whether the obtainable improvement in production by introducing foreign breeds, outweighs the economic damages inflicted by this disease.

ACKNOWLEDGEMENTS

The outhor is indebted to Miss Irene Naute for carrying out the CBT-Elisa. The cooperation of my interpreter, Mr. Recep Kaya, and of my colleagues at the Erzurum Veterinary Laboratory - Dr. Mohammet Aksim, Dr. Fikriye Ekmen and especially Dr. Vildan Özdemir - in the collection of the sera is higly appreciated. Mrs. Victoria Thatcher is acknowledged for editorial assistance.

NOTE

Field work was done while the author was on assignment for the FAO in the Erzurum Rural Development Project, Turkey.

TABLE 1 Locations of serum-collection and results of serology

District	Village	No of animals samples in year		Results of MVV Serology	
		1986	1987	post.	neg.
1. Erzurum-Merkez	Şenyurt		12	0	12
	Palandöken	12		0	12
2. Aşkale	Merdivenköy	9		0	9
	Yeniköy		6	0	6
3. Çat	Parmaksız		5	0	5
	Ashar Çat		5	0	5
4. Hınıs	Halilçavuş		10	0	10
5. Horasan	Hasanbey		10	0	10
	Muratbağı		8	0	8
	Aras		2	0	2
6. Ispir	Pazaryolu		10	0	10
7. Karayazi	Çakmaközü	5		1	4
			5	0	5
	Salyamac	5		1	4
			5	1	4
8. Narman	Savaşcılar		5	0	5
	Kışlaköy		6	0	6
9. Olur	Ormangazi		5	0	5
	Olgun		5	0	5
10. Oltu	Gönlüce	5		0	5
	Camlıbel		5	0	5
11. Pasinler	Büyük Tüy	11		0	11
	Küçük Tüy	6		0	6
12. Şenkaya	Merkez	11		0	11
	Kömürlü		5	0	5
13. Tekman	Çevirme		4	0	4
	Erence	11		0	11
14. Tortum	Alapınar		4	0	4
	Yukarı Sivri		6	0	6
Total		**75**	**123**	**3**	**195**

REFERENCES

Alibaşoğlu, M. and Arda, M. (1975) : Koyun pulmoner adenomatosis'inin Türkiye' de durumu ile patolojisi ve etiyolojisinin araştırılması. Tübitak-VHAG Yayınları. 273/4: 111.

Cutlip, R.C., Lehmkuhl, H.D., Brogden, K.A. and Bolin, S.R. (1985) : Mastitis associated with ovine progressive pneumonia virus infection in sheep. Am. J. Vet. Res. 46 (2): 326-328.

Dawson, M. (1987) : Pathogenesis of maedi-visna. Vet. Rec. 120: 451-454.

Girgin, H., Aydın, N., Yonguç, A.D., Aksoy, E. and Çorak, R. (1987) : Ve şimdi koyunların viral maedi-visna'sı Türkiye'de. Etlik Vet. Mikrob. Derg. 1987, 6 (1): 9-22.

Houwers, D.J. and Schaake, J., Jr. (1987) : An improved ELISA for the detection of antibodies to ovine and caprine lentiviruses, employing monoclonal antibodies in a one-step assay. J. Immunol. Methods, 98: 151-154.

Houwers, D.J. in «Maedi-Visna and related Lentivirus-infections» (Eds. G. Pétursson and R. Hoff-Jørgensen), Development in Veterinary Virology, M. Nijhoff, Amsterdam, in press.

Houwers, D.J., Pekelder, J.J., Akkermans, J.P.W.M., Van der Molen, E.J. and Schreuder, B.E.C. Incidence of indurative lymphocytic mastitis in a sheep flock heavily infected with maedi-visna virus. Vet. Record, in press.

Pálsson, P.A., Maedi and visna in sheep. In: Slow viruses of animals and man (Ed. R.H. Kimberlin), North-Holland Publishing Company, Amsterdam, Oxford, 1976: 17-43.

Van der Molen, E.J., Vecht, U. & Houwers, D. (1985) : A chronic indurative mastitis in sheep, associated with maedi/visna virus infection. Vet. Quarterly 7, 112.