ARGUMENT ABOUT TRANSMISSION OF *TOXOCARA VITULORUM* IN BUFFALOES AND COWS

I. MOSSALAM[1], M.S. NADA[1] AND K. EL-KHOLANY[2]

1 *Faculty of Veterinary medicine, zagazig University .*

2 *Animal Health Research Institute, Agricultural Research Centre, Giza, Egypt.*

(Manuscript received 1 November 1995)

Abstract

Certain nematodes utilize milk as a means of transfer from one host to another. The transmammary passage of *Toxocara vitulorum* is very rare. Only one buffalo (out of 42 buffaloes and cows) proved to have *Toxocara vitulorum* larvae in its milk which may be an indicative of the transmammary transmission. The appearance of *T.vitulorum* eggs in faeces of calves born from experimentally infected buffaloes is attributed to the transplacental infection.

INTRODUCTION

Most of parasites utilize certain modes or combination of modes in infecting new hosts. Warren (1971) reported *Neoascaris vitulorum* larvae in the milk of experimentally infected cows between 2nd and 18th day post-partum. Tongson (1971) found Toxocara vitulorum larvae in the sediment of 14 milk samples taken from Murrah buffaloes. However, Stewart and Stone (1981) reported Toxocara vitulorum larvae in colosturm and milk of naturally infected cattle, but not in the milk of experimentally infected ones. On the other hand, Swain *et al.* (1987) were unable to detect *Toxocara vitulorum* larvae in colosturm and milk samples of dams inspite of their calves descending *Toxocara vitulorum* eggs in their faeces. Mossalam *et al.* (1991) mentioned that *Toxocara vitulorum* larvae were not detected

neither in colostrum nor in milk samples randomly collected from 412 buffaloes and 259 cows and from 20 experimentally infected buffaloes and cows. Pandey et al. (1990) mentioned that Toxocara vitulorum larvae were not detected in colostrum and milk samples collected from 55 cows aftter parturition. Roberts *et al.* (1990) recorded that most larvae of Toxocara vitulorum were present in colostrum and milk samples of buffaloes from the day after calving and further 5 days, and very few larvae were found from day 9 onwards. Partoutoma et al. (1993) reported *Toxocara vitulorum* larvae in one of 14 milk samples collected from cows, and 2 larvae were found in 2 out of 51 milk samples collected from 51 Ongole cows .

Further study about the role of milk in transmission of *T.vitulorum* was the aim of the present work .

MATERIALS AND METHODS

Colostrum and milk samples of 42 animals (29 buffaloes and 13 cows) were examined after parturition for detection of *Toxocara vitulorum* larvae. Colostrum of each was examined for 3 successive days and the milk samples of each were examined daily up to one month after parturition .

Examination of colostrum and milk samples were done according to Enigk and Stoye (1967) and Pandey *et al.* (1990) .

Three healthy pregnant buffaloes (*Bos bubalis* L.) were experimentally infected each with 30000 embryonated eggs of *Toxocara vitulorum* at, 1,2 and 3 months pre-partum, respectively. Eggs for experimental infection were obtained from the uteri of the dissected mature female worms and washed several times by saline thee, the washed eggs were placed in Petri-dishes containing a thin layer of 2-3 mm depth of 2.5% potassium dichromate solution and incubated at 26^{o}C for 20 days to complete embryonation. Some residual placental foetal fluids were taken after animal parturition and examined for *Toxocara vitulorum* larvae. The born calves were allowed to suckle colosturm and milk of their dams. Colostrum and milk samples of the parturient dams were examined daily through 30 days for detection of *Toxocara vitulorum* larvae. Faecal samples from born calves were examined daily from 10th day up to 40 th day of birth by direct smear and saturated sodium chloride concentrated technique for detection of *Toxocara vitulorum* eggs .

RESULTS

Only one buffalo (out of 42 buffaloes and cows) proved to have 3rd stage larvae in its milk samples on 8th day post-partum. The recoverd larvae were identified as Toxocara vitulorum larvae on the basis of their size and the presence of a well developed ventriculus and clearly demarcated lips with presence of a cuticular lining of the rectum. These obvious characteristics were enough for distinguishing *Toxocara vitulorum* larvae from other milk borne and extraneous parasites such as *Strongyloides papillosus*. Sedimentation of the foetal fluids of experimentally infected buffaloes with embyonated *Toxocara vitulorum* revealed absence of *Toxocara vitulorm* larvae. Examination of the faeces of the born calves from experimentally infected buffaloes during late pregnancy revealed eggs of *Toxocara vitulorum* on the 17 th - 25 th days of parturition .

DISCUSSION

In the present study, out of 42 buffaloes and cows, only one buffalo (2.38%) was postive for *Toxocara vitulorum* larvae in its milk. Nearly, the percentage (2.14 %) was recorded by Gautam et al. (1976) who found 4 positive samples for *Neoascaris vitulorum* from 187 milk samples. Examination of colostrum and milk samples of the 3 experimentally infected buffaloes with *Toxocara vitulorum* eggs during late pregnancy did not reveal larvae. The same results were obtained by Stewart and Stone (1981), Swain et al. (1987), Pandey *et al.* (1990) and Mossalam *et al.* (1991). In this study, the eggs of *Toxocara vitulorum* were detected in the faeces of calves when they were 17-25 day old, but their respective dams colostrum and milk samples were negative for larvae. This result was in agreement with that obtained by Baruah *et al.* (1981) who found eggs of *Neoascaries vitulorum* in faeces of calves 21-30 days old, but no larvae were found in their mothers milk. Also, Stewart and Stone (1981) did not report *Toxocara vitulorum* larvae in the milk of experimentally infected cattle. Panday et al (1990) and Roberts *et al.* (1990) found *Toxocara vitulorum* eggs in faeces of buffalo calves when they were 22-24 days old. Swain et al. (1987) stated that, the rate of infection with *Toxocara vitulorum* was (39%) in calves 1-2 months of age, and they were unable to detect larvae in their mothers milk .

The absence of larvae in colostrum or milk samples and the early apperance of *Toxocara vitulorum* eggs in the faeces of calves may be attributed to the prenatal

infection which was believed to be the usual mode of infection. This result coincided with that obtained by Mozgovoi *et al.* (1973), Barbosa and Corerra (1989) and Mossalam *et al.* (1991). On the other hand, the transmammary transmission of *Toxocara vitulorum* to the calves through mother's milk in the present study, also, coincided with the results obtained by Mia *et al.* (1975), Pandey *et al.* (1990), and Partoutoma *et al.* (1993).

From the above argument, it appears that, some authors claim the presence of *Toxocara vitulorum* in the milk of buffaloes and cows, while others did not find larvae in milk. Pregnancy has an important influence on the migratory behaviour of certain parasites both in favourable and unfavourable hosts (Lewert 1958 and Lee *et al.* 1976). It has been suggested that, transmission of larvae to the foetus during pregnancy is due to reactivation of encysted larvae in the tissues of the host, enhancing their invasion (Beaver 1956).

The present thinking on the mechanism of migration of infective larvae from somatic tissues to mammary glands, and subsequent transmission to suckling young, is due to released hormones during late pregnancy or just prior to parturition being resp onsible for such stimulation (Webster 1958 and Olsen & Lyons 1962).

REFERENCES

1. Barbosa M.A. and P.M.A. Correa. 1989. Natural parasitism of buffaloes in Botuecatu, Saopaulo, Barazil observation on *Toxocara vitulorum.* Arquivo Brasileiro de Medicina Veterinaria Zootecnia, 41 (6) : 521-525 .

2. Baruah P.K., R.P. Singh and M.K. Bail. 1981. Relationship between presnece of 3rd stage larvae of *Neoascaris vituloum* and *Strongyloides papilosus* in colostrum and milk of buffaloes and appearance of eggs in the faecal samples of their calves. Indian J. Dairy Sci, 34 : 76-78.

3. Beaver, P.C. 1956. Parasitological reviews larva migrans. Exp. Parasit., 5: 587 - 621.

4. Enigk, K. and M. Stoye. 1967. Untersuchungen uber den Infektion von *Ancylostoma caninum* beim Hund. KongreBbericht uber die III Tagung der Deutschen Tropenmedizinischen Gesellschaft e. V, vom 20-22 April in Hamburg Urban und Schwarzenberg, Munchen-Berlin- Wien : 101 - 113 .

5. Gautam, O.P, P.O. Malik and D.K. Singh. 1976. *Neoascaris vitulorum* in colostrum and milk of buffaloes. Curr. Sci, 45 (9) : 350 - 351 .

6. Lee, K.T, H.K. Min and C.T. Soh. 1976. Transplacental migration of *Toxacara canis* larvae in experimentally infected mice. J. parasit., 62 : 460 - 465 .

7. Lewert, R.M. 1958. Invasion of helminth larvae. Rice Inst. Pamphlet., 45 : 97-133 .

8. Mia, S., M.L. Dewan, M. Uddin and M.U.A. Showd hury. 1975. The route of infection of buffalo calves by *Toxocara vitulorum.* Trop. Anim. Health prod., 7 : 153-156.

9. Mossalam, I., G.H. Amer and K. El-Kholany. 1991. Studies on alleged transmammary transmission of *Toxocara vitulorum* in buffaloes and cows. 3rd World Buffalo Cong. Bulgaria, Varna, May 13-18, IV : 1073 - 1075 .

10. Mozgovoi, A.A, V.I. Shakatova and R.M. Shinkhov. 1973. Experimental study of the life cycle of *Neoascaris vitulorum*, a pathogenic nematode of ruminants. Moscow, 12 datestvo " Nauka " : 105 - 112 .

11. Olsen, O.W. and E.T. Lyons. 1962. Life cycle of the hook worm, *Uncinaria lucasi* of northern fur seal on the pri-birth of Island Alaska. J. Parasit., 51 : 689 - 700 .

12. Pandey, V.S., F.W.G. Hill, D.G. Hensman and L.C. Bara gwanath. 1990 . *Toxocara vitulorum* in beef calves kept on efficient irrigated pastures in Zimbabwe. Vet. Parasit., 35 : 349-355 .

13. Partoutoma, S., M. Suhardono and G. Adiwinata. 1993. The infection of *Toxocara vitulorum* in cattle and buffalo calves in selabinta sukanaja and surade, in the district of sukebumi. Vet. Bull., 63 (2) : 150 - 151 .

14.Roberts, J.A., S.T. Fernando and S. Sivanthan. 1990. *Toxocara vitulorum* in the milk of buffalo (bubalus bubalis) and cows. Res. Vet. Sc., 49 (3) : 289 - 291 .

15. Stewart, T.B. and W.M. Stone. 1981. Report of the meeting on Peri-parturient transmission of parasites. Rev. Adv. Parasit. (warszawa) : 1024-1033 .

16. Swain. G.D., S.C. Misra and D.N. Panda. 1987. Incidence and chemotherapy of *Neoascaris vitulorum* infection in Murrah buffalo calves at Bhubane Shwar. Ind. Vet. J., 195 - 202 .

17. Tongson. M.S. 1971. *Neoascaris vitulorum* in milk of Murrah buffalo. Phillipine J. Vet. Med., 10 (1) : 60-62 .

18. Warren. E.G. 1971. Observation on the migration and development of *Toxocara vitulorum* in natural and experimental hosts. Int. J.Parasit.,1: 85-95.

19. Webster. G.A. 1958. A preliminary report on the biology of *Toxocara canis*. Canad. J. Zol., 34 : 725 - 726 .

جدل حول إنتقال عدوى التوكسوكارافيتولورم فى الجاموس والأبقار

إسماعيل مسلم[1] ، محمد سعيد ندا[1] ،
خالد عبد الحليم الخلانى[2]

١ كلية الطب البيطرى – جامعة الزقازيق .
٢ معهد بحوث صحة الحيوان – مركز البحوث الزراعية – الدقى – جيزة .

تستخدم بعض الديدان الخيطية اللبن كوسيلة للانتقال من عائل لآخر ، ففى حالة التوكسوكارافيتولورم، لم يتم العثور على يرقات الطفيل فى عينات لبن الجاموس والأبقار إلا فى حالة واحدة فقط وذلك يدل على أن العدوى عن طريق اللبن قد تكون فى الحالات النادرة. و ظهور بيض الطفيل مبكرا فى براز العجول حديثة الولادة يعزى إلى أنتقال الطفيل إليها قبل ولادتها عبر المشيمة.