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Case Report

Nutritional Deficiency-Induced Bilateral Ocular Blindness in a Newborn Lamb: A Case Report

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ABSTRACT
This report reveals a rarely reported occurrence of ocular blindness in a newborn lamb suspected to be due to nutritional deficiencies in a pregnant Ewe. It involved a 1-week-old lamb brought to Theriogenology Unit of the University of Maiduguri Veterinary Teaching Hospital (UM-VTH), Maiduguri with complaint of sudden vision loss, noticed by the client after five days that the lamb was delivered. Clinical examinations revealed that both the dam and the lamb were feeble, but without any neurologic signs. Ophthalmic evaluations of the lamb revealed corneal opacity of the two eyes and a complete bilateral vision loss. The client was unable to ascertain the possibility of intake of colostrums within the first few days of birth of the lamb. In the ewe, un-thriftiness, unstable gait and notable appearances of the skeletal ribs and paralumbar fossa region were observed. The lamb died within few hours after presentation at the hospital. Optic nerve lesions and injuries on the cranial bones were not found during the postmortem ophthalmic examination of the lamb's eye. Nutritional improvement that involved placement of ewe on diets supplemented with essential macro-and-trace minerals during pregnancy was recommended as a preventive measure for future re-occurrence of the condition in the sheep flock.

Keywords: Maiduguri; Newborn lamb; Nutrition; Ocular blindness; Pregnant ewe

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INTRODUCTION

In sheep production systems, ocular blindness in newborn lambs poses a significant threat to neonatal wellbeing and productivity (Banin *et al.,* 2009). Although, this condition may arise principally from infectious and hereditary factors (Hunt *et al.,* 2022); inadequate nutrition in pregnant ewes is a well-known but often overlooked cause (Bush et al., 2006). Foetal growth particularly during organogenesis when the ocular structures are developed depends on adequate maternal nutrition during gestation. Essential nutrients such as vitamin A, selenium, zinc, copper and several amino acids are required for improved retinal development and optic nerve functions in neonates (Gruner *et al.,* 2004; Abou-Zeina *et al.,* 2008; Hosnedlova *et al.,* 2017). A major risk factor for conditions like microphthalmia, retinal degeneration and bilateral ocular blindness in lambs is an inadequate maternal consumption of vitamin A during pregnancy. Vitamin A is critical in embryonic morphogenesis, epithelial integrity and photoreceptor differentiation (Kang *et al.,* 2017; Sajovic *et al.,* 2022; Pupin *et al.,* 2023).

Furthermore, deficiencies in trace minerals such as zinc and copper may cause optic neuropathies because they

support the enzymatic process required for normal ocular development (Kojouri and Shirazi, 2007). Nutritionally-induced blindness is prevalent in areas where pregnant ewes rely mostly on poor quality fodder or inadequately supplemented diets, particularly during the dry-season. Such nutritional imbalances not only impair foetal ocular structures during growth but negatively impact the ewe's overall reproductive function, which further reduces the flock output (Rao *et al.,* 2018; Asin *et al.,* 2021; Hunt *et al.,* 2022). Case reports on neonatal blindness and understanding the relationship between maternal nutrition and neonatal ocular health are critical in developing preventive measures to lower the incidence of blindness in newborn lambs. This paper presents a case of ocular blindness in newborn lamb suspected to be due to nutritional deficiencies in a pregnant Ewe

CASE PRESENTATION

On 26th July 2025, a 1-week-old lamb was brought to Theriogenology Unit of the University of Maiduguri Veterinary Teaching Hospital (UM-VTH), Maiduguri with complaint of sudden vision loss, noticed by the client after five days that the lamb was delivered (Figure 1a). Anamnesis revealed that the dam had delivered the lamb without any assistance, although the dam's body condition score upon physical examination was estimated at 2 on a scale of 1 to 5 (Figure 1d). According to the client also, the lamb could see within the first 48 hours of birth but began to notice blindness at day 5 post-delivery. Clinical examinations revealed that both the dam and the lamb were feeble, but without any neurologic signs when presented to the hospital. Ophthalmic evaluations of the lamb revealed corneal opacity of the two eyes and a complete bilateral vision loss (Figure 1b). The client was unable to ascertain the possibility of intake of colostrums within the first few days of birth of the lamb. The lamb could not stand without assistance and died few hours after presentation at the hospital. A normal optic disc with blood vessels was observed during the postmortem examination (Figure 1c).

Figure 1a: vision loss in a weak lamb presented at day 7 old of birth

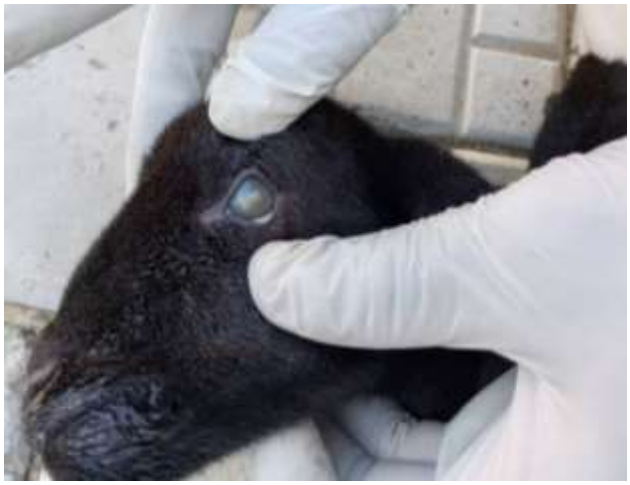

Figure 1b: corneal opacity of the eye in 1-week old lamb

Figure 1c: a normal optic disc with prominent blood vessels observed at postmortem of the lamb

Figure 1d: The dam with poor body condition (estimated at 2 on a scale of 1 to 5)

DISCUSSION

The case in this report is a rarely reported occurrence of ocular blindness in newborn lamb suspected to be due to nutritional deficiencies in a pregnant Ewe. Nutritional management is a critical factor that ensures adequate productivity, prevents wasting in sheep and reduces threat of neonatal wellbeing (Asin *et al.,* 2021). The condition of the ewe in this report was characterized by emaciation, unstable gait and notable appearances of the skeletal ribs and paralumbar fossa. The ewe's body condition was estimated at 2 on a scale of 1 to 5, which showed that the animal was either fed with poor quality feed or inadequately supplemented diets. Detailed flock history with clinical examination was the basis for the diagnosis of this condition. In other reports, poor nutrition has led to metabolic disorders such as sub-acute ruminal acidosis and subsequent emaciation (Asin *et al.,* 2021). The sub-acute ruminal acidosis does arise from low ruminal pH when there is excess concentrate in diets. Furthermore, motility disorder in non-rumen chambers of the stomach may also contribute to ill-thrift and gaunt seen in poorly fed animals (Hosnedlova *et al.,* 2017; Asin *et al.,* 2021).

Conceivably, foetal growth particularly during organogenesis when the ocular structures are developed depends on adequate maternal nutrition. Ophthalmic evaluation of the lamb in this report showed that there were corneal opacity of the two eyes and a complete bilateral loss of vision from the fifth day the case was noticed. Deficiency of essential nutrients such as vitamin A, selenium, copper and some amino acids may be incriminating factors as this macro-and trace minerals are needed for improved retinal development and optic nerve functions in neonates (Abou-Zeina *et al.,* 2008; Hosnedlova *et al.,* 2017). We suspected shortage of essential nutrients in the dam and their consequent insufficient transfer and impact as passive immunity to the lamb during lactation. This has been similarly reported by Asin *et al.* (2021) and Pupin *et al.* (2023).

It was not ascertained if the lamb took colostrums from its mother, and no optic nerve lesions were evident during postmortem ophthalmic examination; hence the blindness could have been due to nutritional deficiencies. In a previous study also, neonatal blindness in bovine have been reported and thought to be due to photoreceptor degeneration caused by rhodopsin deficiency that is synthesized from nutrients such as vitamin A (Pupin *et al.,* 2023). Likewise, the blindness observed in the current report does not include bilateral optic disk swelling, as often reported in malnourished dams particularly with hypovitaminosis (Kang *et al.,* 2017).

CONCLUSION

Nutritional deficiency-induced bilateral ocular blindness in a newborn lamb is herein reported. The main clinical signs in the lamb were corneal opacity of the two eyes and a complete bilateral vision loss; while for the ewe, un-thriftiness, unstable gait and notable appearances of the skeletal ribs and paralumbar fossa region were observed. Nutritional improvement that involved placement of ewes on diets supplemented with vitamins, sodium chloride and essential macro- and trace minerals during pregnancy was recommended as a preventive measure for future re-occurrence conditions in the sheep flock.

Conflict of Interest

The authors declare that there is no conflict of interest in this case report

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