

Microcephaly in a Lamb- A Case Report

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Abstract

An ewe with the complaint of dystocia was presented for treatment. A dead male lamb with congenital malformation was delivered with medical assistance. The report documents microcephaly in a lamb

Keywords: Microcephaly, Lamb, Microencephaly

Introduction

Microcephaly is a descriptive term meaning a small head and is usually associated with microencephaly which means small brain. In humans it is usually defined as a head circumference (HC) more than 3 standard deviations below the mean for age and gender. Congenital malformations are structural and functional abnormalities present at birth. They can affect a single structure or function, parts of various systems, or an entire system (Noden and De Lahunta 1985). The common causes for microcephaly are exposure to hazardous chemicals, radiation, lack of proper vitamins and minerals in the diet. The incidence of these abnormalities is reported to vary between 0.2% and 2% in lambs (Dennis 1979). The present case deals with microcephaly in a lamb.

History and Clinical Findings

A two year old primiparous ewe was brought with the complaint of dystocia for treatment. A still born male lamb with malformation was pulled out with assistance. Physical examination of the lamb revealed microcephaly (Fig.1) with flattened frontal area and thickened cranial bones.



Fig.1 Microcephalus-Lamb

Fully developed eyes, ears, nostril and mouth were also observed. All the four limbs were present. The lamb was subjected to radiological (Fig.2) examination which revealed small skull and well developed vertebral bones.



Fig.2 Radiograph showing microcephalus

Discussion

The etiology of most congenital malformations is unknown, simply because of the complexity of the mechanisms leading to the formation of an abnormality. Genetic, environmental factors, or their interaction, were the most common causes of congenital abnormalities.

Nutritional deficiency of minerals may be one of the causes of microcephaly. Hurley and Shrader (1972) stated that severe zinc deficiency in animals had been associated with structural malformations of the brain, such as anencephaly, microcephaly, and hydrocephaly. Zinc, a trace mineral is prevalent in the brain, where it binds with proteins, thus contributing to both the structure and function of the brain.

Since India being a tropical country with the mean temperature of 42-44°C in the summer, hyperthermia may also be one of the reasons for these congenital anomalies. This correlated with the earlier study conducted by Hartley *et al.* (1974) who revealed that ewes exposed to 44°C for 9 h daily during the last two-thirds or last third of gestation showed marked reduction in birth weight, cavitations of the cerebral white matter in 75% and microencephaly in 44% of lambs respectively.

Hyperthermia is thought to be a teratogen in many animal species including primates and also in humans (Smith, 1982). The retrospective human studies have a related hyperthermia to both neural tube and head defects (Fisher and Smith, 1981). Edward (1969) reported that hyperthermia causes several congenital abnormalities in a number of domestic and laboratory species of mammals, including defects on the central nervous system. The biological consequences are extremely sensitive to the heat and hyperthermia exposure, this may lead to harmful effects on them. According to Ahmed (2006), higher the temperature or the longer the hyperthermia, the greater the chance for observing a perturbation to the biological effects.

In the present case the lamb revealed microcephaly with flattened frontal area and thickened cranial bones. This is in accordance with Poul *et al.* (2009) who stated that external features of microcephaly were narrow and flattened frontal area of cranium and thickened cranial bones.

The etiology of most of these malformations is still largely unknown and the same is applicable to this study also that requires further investigation.

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