Case report

Achondroplastic Syndrome in a West African Dwarf Lamb

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Abstract
A three week old, male, West African Dwarf (WAD) lamb presented with disproportionate hind limb was diagnosed of having achondroplastic syndrome by physical and radiological examination. Physical examination showed the right hind limb was deformed at the level of the tarsus, metatarsus and phalanges. Radiological examination showed that the tarsal bones were small and laterally compressed, while the lateral sesamoid bone was absent. The right metatarsal bones were rudimentary while the phalanges were only represented by soft tissue structure. The serum alkaline phosphatase (ALP), aspartate transaminase (AST) and alanine transaminase (ALT) were higher in the achondroplastic lamb than the normal flock mate used as control. Based on the radiographic findings, it was concluded that ectrodactyly was the only feature of the achondroplastic syndrome in the lamb.

Key words:
Achondroplastic Syndrome, Lamb, Dwarf

INTRODUCTION
Congenital defects are abnormalities of structure or function present at birth (Leipold et al, 1972). They can affect an isolated portion of the body system, the complete system or several systems. The frequency of congenital defect in sheep is difficult to assess (Saperstein et at, 1975). The defects are peculiar to a breed, geographical location or environmental condition (Dennis, 1974; 1975).

Developmental errors, which ultimately are expressed in the skeleton, may be primary abnormalities of bones, cartilage or primitive mesenchymal cells (Palmer, 1993). They may be genetic or conditioned by the environment, and in either case, the anomalies may be local or systemic. Genetic factors are characterized either by chromosomal aberrations or mutant genes (Rook et al, 1988). Environmental factors include viral agents, bacterial agents, drugs and plant teratogenes.

Hereditary chondrodysplasia have been shown to be due to simple recessive inheritance (Rook et al, 1986; 1988). Two clinical entities have been reported to include those that were grossly abnormal at birth and those that developed abnormal conformation 4-6 weeks of age (Rook. et al, 1988). Radiographically, however, both groups of lambs have similar skeletal defects at births, substantiating a congenital defect.

Wray et al (1971) had described an achondroplastic syndrome in which ectrodactyly was a feature in South Country Cheviot Lambs. The principal features were achondroplasia of the head with protruding eyes, short ears and tail, with the hind hooves reduced in size and abnormal in shape. From available literature, there are no reports of congenital chondrodysplasia in the West African Dwarf Lamb. This report presents a case of an achondroplastic syndrome in a three week old lamb in which ectrodactyly is the main feature.

Case History and Clinicopathological Findings:
A three week old male West African Dwarf Lamb was presented to the Veterinary teaching hospital with complaint of disproportionate hind limbs. Careful questioning and review of the record of the sock revealed that the lamb belonged to a ewe in a flock of 28 sheep comprising 24 ewes and 4 rams. The flocks are raised semi-intensively and breeding is uncontrolled and may occur during pasture grazing or in the pen. The ewe had lambed twice previously with no record of abortion or congenital defect in any of the previous lambs, similarly, there are no previous records of
abortions or congenital defect in the entire flock. The only medical record on the flock is routine
deworm with Levamisole hydrochloride.

Physical examination of the lamb revealed
that the lamb was healthy, although slightly
underweight. The hind limbs were
disproportionate (Plate 1) with the left hind limb
bowing outward and the right hind limb limb
appeared normal from the pelvis to the distal
tibia. However, the tarsus, metatarsus and
phalanges were deformed. The right hoof was
absent only leaving behind a cutaneous
structure, and a wound on its abaxial surface.
Other parameters were within normal limit of the
age of the lamb.

About 3mIs of blood was collected through
jugular venipuncture from the lamb and a flock
mate of the same age but with no deformity
(Control) for the determination of the serum
values of alkaline phosphatase (ALP) alanine
transaminase (ALT) and aspartate transaminase
(AST). Also both lateral and antero-posterior
radiographs of the hind limb were obtained using
a Philippractex 20mA portable machine
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Results of Laboratory Investigations
The serum ALP, AST and ALT were respectively
higher in the achondroplastic lamb (15 K.A.u/L;
47 i.u/L; 43 i.u/L) compared with the control lamb
(10 K.A.U/L; 36 i.u; 34 i.u/L). Radiological
examination (Plates 2 & 3) showed that the
physes are still opened. The left tibiofibula bone
appeared slightly expanded with thinner cortex.
The right tarsal bones were very small and
laterally compressed while the lateral sesamoid
bone was absent. The right metatarsal bones
were rudimentary and were only represented by
two small fused bones of about 3mm in diameter.
The phalangeal bones were absent and were
only replaced by soft tissue with concave
bowing of the hoof structure. In addition, there
was moderate swelling of the entire tarsus.

DISCUSSION AND CONCLUSION
Chondrodysplasia has been reported in other
breeds of sheep either as a single entity or in
association with other defects (Wray et al 1971;
Rook et al, 1988). However, this appears to be
the first reported case of achondroplastic
syndrome in West African Dwarf Lamb.
Although the exact cause of the defect is
unknown, it is unlikely that the syndrome
described was caused by nutritional factors,
drugs or disease. Some transmissible diseases
have been shown to cause deformed foetus
such as vibriofoeuli listeria monocyto genes and
Congenital defect may be caused by
intrauterine environment or may be hereditary.
(Rook et al, 1988). The most likely explanation
is that this condition is of genetic origin and could
either be due to a recessive gene or a dominant
gene with incomplete penetration.
Routine hematology studies and serum
biochemical analyses are often done as part of investigation of hereditary chondrodysplasia. Rook et al, (1988) reported a slight increase in serum ALP between chondroplastic lamb and normal lambs. In this report, the serum ALP, AST and ALT were respectively higher in the achondroplastic lamb compared to the control lamb.

It is probable that this defect affects the development of the bone or the cartilage. This is so because the tarsal and metatarsal bones were rudimentary while the phalanges were replaced by soft tissue structure.

REFERENCES


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