INFERTILITY IN GOATS RELATED TO TESTICULAR ATROPHY

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SUMMARY

Testicular atrophy in the goat is described as a principal factor in goat infertility. The clinical features of the condition are apparent in reduced testicular size and altered testicular shape. The semen picture is markedly affected: there are reduced numbers of sperms and an associated high incidence of abnormal sperm forms.

INTRODUCTION

Goat breeding is carried out on a world-wide basis but it is probably of greatest importance as an agricultural industry in certain regions where large-scale farming is not practised. In many regions within the tropics goat breeding plays an important role in agricultural economics. In Central American countries, for example, goat flesh is the preferred and therefore the most expensive form of butcher-meat. In some rural communities the size of a small farmer's goat herd indicates his available capital and the goat therefore has certain socio-economic values. Outside of the arid tropics the goat would appear to be well suited for the utilisation of uncultivated areas of bush. Goat reproduction, therefore, merits some attention.

Reports on goat fertility widely indicate that as a general rule it is a highly fertile species; conception rates as high as 80 per cent are common. Jordao and Caldas (1952) reported a conception rate of 87.5 per cent in goat breeding in Brazil and conception rates between 80-85 per cent have been reported for goat breeding in European countries (Achnelt & Brockman, 1955; Blokhuis, 1959; Schmidt, Dietz & Weiss, 1950).

During periods of professional service in the West Indies the author occasionally encountered infertility in goat herds there. On each occasion male infertility was implicated and the simple solution to the problem lay in culling the infertile stud goat. Wider investigations into male goat infertility has established that infertility is not uncommon in this animal (Fraser & Wilson, 1966). Clinical studies by the author, spread over some period of time, have given the impression that the most common cause of goat infertility, in clinical terms, is testicular atrophy.

CLINICAL AND EXPERIMENTAL METHODS

Most cases of testicular atrophy were encountered in goats in the tropics during clinical routines and were therefore examined only once. A small number, however, were experimentally maintained and were examined repeatedly over a period of several months to observe the course of the condition including the changing semen picture. The clinical findings, from their several sources, are considered collectively below.
General

The testes of the goat are smaller than those of the sheep and they are suspended within an elongated and relatively thin scrotum. They can be easily grasped and each testicle and its epididymis can be readily palpated overall. Testicular size, shape, consistency and intra-scrotal mobility can be ascertained without difficulty. Clinical normality is indicated when each of these four features meets exacting standards derived critically from young mature male goats of proven fertility. Certain deficiencies in these features characterise testicular atrophy. The normal testicle has a well-rounded base and has a deep notch between this convex base and the protruding cauda epididymidis. The caput epididymidis has detectable lobulations in the normal subject.

Testicular atrophy

In testicular atrophy the testes are typically reduced in size and altered in shape. The consistency of the testicular parenchyma may also be detectably changed; in some cases induration may be evident while in other cases the testes become softer. The nature of testicular consistency is dependent on the pathological nature of the degenerative changes within the substance of the testicle. In some cases of testicular calcinosis excessive firmness is detectable, while atrophy due to extensive tubular degeneration reduces the consistency of the testicle.

Reduction in testicular size is a constant feature of testicular atrophy and in the most advanced cases the affected testicle may become half its former size.

In atrophy the gland is also typically altered in shape and two forms of abnormal shape can be encountered:

(i) The most common alteration in testicular shape as a result of atrophy involves a reduction in horizontal circumference. This reduction, taking place at all horizontal levels, narrows the testicle throughout its vertical length. The length may be reduced in some cases and not in others. As a result the testicle acquires an elongated appearance although it is certainly not longer. The reduction in circumference is most noticeable at the ventral pole of the testicle so that the normal fullsome convexity at this site is lost. In consequence of this, the notch between the basal contour and the tail of the epididymis becomes shallow, the angle between these two parts becoming obtuse.

(ii) Another pathological testicular shape resulting from atrophy is one in which the affected testicle becomes reduced in size in all planes, eventually becoming small and spheroidal. Here again the basal convexity is lessened and the angle or 'notch' between the tail of the epididymis and the ventral line of the testicle becomes significantly wider.

Epididymal change

While the tail of the epididymis does not appear to become involved in any of these testicular changes and shows no sign of undergoing a 'sympathetic' atrophy the same statement does not hold good for the caput epididymidis. This structure loses lobulation in association with progressive testicular atrophy. The loss of lobulation may be clinically detectable on careful testicular palpation in cases where the degenerative processes are advanced.