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Studies on biometry of female genitalia in Nellore sheep of Andhra Pradesh

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Abstract

The present study was undertaken to evaluate the biometry of female genitalia of Nellore sheep of Andhra Pradesh. Fifty non-gravid female genitalia of sheep were collected from the abattoir immediately after slaughter to study the biometry of different parts of genitalia. The biometry was studied in the three groups viz., ewe lambs (n=25), ewes in follicular phase (n=13) and ewes in luteal phase (n=12). Dimensions of less than 10 cm were made by means of vernier caliper and those above 10 cm were recorded with the help of a thread that was calibrated against the measuring scale. The results showed a significant difference ($P < 0.01$) in different dimension of ovaries, uterine horn, uterine body and cervix between the ewe lambs in comparison with adult ewes; while there was no significant difference ($P > 0.05$) in different dimension of ovaries, uterine horn, uterine body and cervix between adult ewe in follicular and luteal phase of the estrous cycle.

Keywords: Biometry, female genitalia, ewe lambs, follicular phase, luteal phase

1. Introduction

India is a plentiful source of diverse ovine germplasm with 74 million of ovines which are 6.8% of world sheep population [1]. There are about 60 recognized sheep breeds in India, with Andhra Pradesh having 17.6 million sheep in as per 20th Livestock Census report of Department of Animal Husbandry, Dairying and Fisheries, Government of India. Knowledge of the biometry of the female ovine genitalia is of great significance in determining the breeding efficiency, diagnosis, treatment and management of infertility, artificial insemination and embryo transfer technology [2]. The reproductive anatomy is complex and least understood as compared to cattle, buffaloes, goat and pig.

Studies on biometry of female genital tract reveals the overall reproductive wellbeing of the animals and the knowledge is essential improved ease of artificial insemination, conception rates and to identify problems of infertility due to anatomical defects [3]. Perusal of literature revealed meagre information with regards to the biometry of genitalia, except for few reports on Malpura and Kheri ewes [4]. However, such systematic information for Nellore Jodipi sheep was not available. Therefore, the present study was planned to establish baseline data on the normal biometry of different segments of the reproductive tract of the Nellore Jodipi sheep.

2. Material and Methods

The female genitalia were collected from abattoir located at Vijayawada and was visited on several occasions to collect 50 specimens representing 25 ewe lambs and 25 adult ewes that were examined prior to slaughter, the animals were classified into ewe lambs and ewes based on the dental configuration. The genital organs without pregnancy and visible abnormalities were selected for the present study. The selected organs were washed with sterile normal saline and packed with ice cubes and transported to Department of Veterinary Gynaecology & Obstetrics, N.T.R. College of Veterinary Science, Gannavaram, in an igloo box for biometric studies of different segments of the genitalia (Figure 1). The genitalia of the ewes were further grouped into two categories based on the presence of the ovarian structures into follicular phase and luteal phase. The biometry was studied in the three groups viz., ewe lamb (n=25), ewes in follicular phase (n=13) and ewes in luteal phase (n=12).

The organs were placed in a tray and the different segments of the reproductive tract viz. length and diameter of cervix, length of uterine body, length and diameter of left and right uterine horns and length, width and thickness of left and right ovaries were recorded in centimeters under natural light.

Dimensions less than 10 cm were made by means of vernier caliper and above 10 cm with the help of a thread that was calibrated against the measuring scale as per the procedure described earlier [2]. All the dimensions are expressed in centimetres. The statistical analysis such as Analysis of Variance (ANOVA) of the experimental data was done by adopting computer software (version 15.0, SPSS Inc. Munich) and excel (version 2007 Microsoft) and as per the standard

procedures [5].

3. Results and Discussion

The dimensions of right and left ovary (length, width and thickness), right and left uterine horn (length, diameter), uterine body (length) and cervix (length and diameter) were presented in Table 1 and Figure 2.

Table 1: The Mean \pm SE of parameters related with biometry of ovaries, uterus, cervix of ewe lambs and ewes of follicular phase and luteal phase.

Parameters		Ewe Lambs (n=25)	Adult Ewes		Overall Mean
			Follicular Phase (n=13)	Luteal Phase (n=12)	
Ovary	Right	Length (cm)	1.49 \pm 0.00 ^a	1.70 \pm 0.00 ^b	1.59 \pm 0.01
		Width (cm)	0.49 \pm 0.01 ^a	0.70 \pm 0.00 ^b	0.59 \pm 0.01
		Thickness (cm)	0.77 \pm 0.02 ^a	1.14 \pm 0.02 ^b	0.95 \pm 0.03
	Left	Length (cm)	1.51 \pm 0.11 ^a	1.76 \pm 0.01 ^b	1.63 \pm 0.01
		Width (cm)	0.49 \pm 0.01 ^a	0.73 \pm 0.01 ^b	0.60 \pm 0.01
		Thickness (cm)	0.77 \pm 0.02 ^a	1.14 \pm 0.02 ^b	0.96 \pm 0.03
Uterine Horn	Right	Length (cm)	10.08 \pm 0.15 ^a	13.99 \pm 0.34 ^b	11.93 \pm 0.032
		Diameter (cm)	1.10 \pm 0.05 ^a	1.74 \pm 0.02 ^b	1.42 \pm 0.05
	Left	Length (cm)	10.09 \pm 0.15 ^a	14.23 \pm 0.36 ^b	2.12 \pm 0.31
		Diameter (cm)	1.09 \pm 0.05 ^a	1.84 \pm 0.02 ^b	1.43 \pm 0.05
Uterine Body	Length (cm)	1.44 \pm 0.03 ^a	2.40 \pm 0.06 ^b	2.42 \pm 0.06 ^b	1.91 \pm 0.05
Cervix	Length (cm)	2.94 \pm 0.13 ^a	5.23 \pm 0.11 ^b	4.83 \pm 0.12 ^b	3.97 \pm 0.16
	Diameter (cm)	0.81 \pm 0.05 ^a	1.04 \pm 0.03 ^b	0.9 \pm 0.03 ^b	0.89 \pm 0.03

^a Means bearing different superscripts within the row differ significantly ($P < 0.01$)

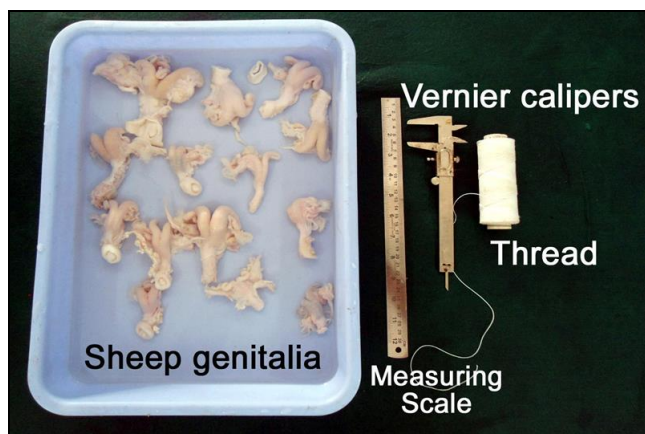


Fig 1: Genitalia collected from abattoir for recording the biometry

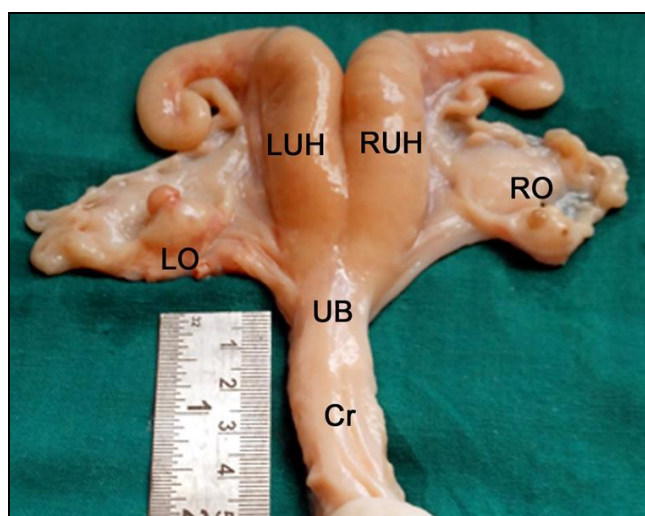


Fig 2: Different parts of genitalia for recording the biometry
Cr: Cervix; UB: Uterine body; LUH: Left uterine horn; RUH: Right uterine horn; LO: Left ovary; RO: Right ovary

A significant ($P < 0.01$) difference was observed between the biometry of length, width and thickness of both the right and left ovaries of ewe lambs and adult ewes whereas no significant ($P > 0.05$) difference was observed in these parameters between the adult ewes during follicular and luteal phases with a marginally lowered values during luteal phase. In the present study, a marginally higher biometry was recorded in left ovary in all the three groups. Similar trend of having non-significantly ($P > 0.05$) higher length, width and thickness for left ovary compared to right ovary was also recorded in earlier studies [2, 6]. On the contrary, few studies have reported that right ovary was physiologically more active which was reflected in terms of greater length, width and thickness of the right ovary [7, 8]. While, some studies concluded that the difference was non-significant between the comparative length and width of right and left ovaries [9, 10]. The length and diameter of both the uterine horns between ewe lambs and adult ewes had significant ($P < 0.01$) difference, whereas no significant ($P > 0.05$) difference was observed between the length and diameter of uterine horns in between adult ewes of follicular and luteal phases. No significant ($P > 0.05$) difference was observed with regards to length and diameter between the right and left uterine horns which were nearly analogous with slightly higher dimensions for left uterine horn. It was reported that the length of uterus in Gaddi ewes was more than that of the Egyptian sheep [6]. From previous studies it was observed that the right uterine horn was non significantly longer than that of the left uterine horn [2], while other reports recorded a slight increase in the length of the left uterine horn which was non-significant as noticed in the present study [7, 10]. The uterine body recorded a significant ($P < 0.01$) difference between ewe lambs in comparison with adult ewes during follicular and luteal phases. Similar findings with respect to length of uterine body were also reported in Gaddi ewes [6], local Kashmiri ewes [2] and Yankasa ewes [10]. On the contrary, greater dimensions

were reported in Awassi ewes [7] and local sheep of Kurdistan region [11], while in indigenous Bangladeshi ewes the uterine body diameter was similar to that of the present study [9].

The mean length and diameter of cervix was significantly ($P < 0.01$) different between the ewe lambs in comparison with adult ewes. The findings in the present study were similar to those reported in Santa Ines ewes [12], Brazilian Somalis ewes [13] and Yankasa ewes [10]. Variations were observed in Barbari ewe lambs [14] and Lori ewes [15], which had larger cervix. While, Barbari ewes, indigenous Bangladeshi ewes [9] and Santa Ines ewes [16] exhibited lower biometry of cervix. The differences in biometry of ovaries, uterine horn, uterine body and cervix in comparison with previous studies might be due to variations in breed, age, season of study, sample size, geographical and many other factors like genetic make-up and endocrine profile of the ewes under report [2, 10].

4. Conclusion

It is concluded from the present study that measurements of the different parts of female genitalia in Nellore sheep of Andhra Pradesh are more or less similar to the earlier reports in other Indian breeds of sheep with little variations. The data thus generated would be beneficial to the researchers and could be used as baseline data to improve the knowledge with respect to the female genital system in Nellore breed. Further, the data on anatomical variations in the female genitalia would help in evolving simple and easy steps in artificial insemination and pregnancy diagnosis.

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