

In Vitro Study on Fallopian Tube Patency in Buffaloes

G. M. ANSARI, H. P. GUPTA AND SHIV PRASAD

Department of Animal Reproduction Gynaecology and Obstetrics
College of Veterinary and Animal Sciences
G. B. Pant University of Agriculture and Technology
Pantnagar, Uttarakhand - 263 145

ABSTRACT

Morbid genitalia (309), obtained from freshly slaughtered she buffaloes, were examined for gross abnormalities and assessment, delineation of site and nature of blockade in the fallopian tube by uterotubal insufflation test, salpingography and tubal histopathology. It was observed that 64.06% genitalia had different abnormalities. Further 11.32%, 39.15% and 49.51% genitalia had bilateral blockage, unilateral blockage and bilaterally patent oviducts, respectively.

Key words: Tubal patency, uterotubal insufflation test, salpingography, buffalo.

INTRODUCTION

Cows / buffaloes with tubal abnormalities may show normal or nearly normal oestrous cycles, but fail to conceive even after repeated service. Repeat breeding, as a cause of infertility, is economically more important, because it prolongs inter-calving interval, affects quantum and regularity in the production of milk and calf crop, as well as leads to wastage of superior germplasm through repeated service.

Fallopian tube, an important and vital link between the ovary and uterus, is concerned with both transport of gametes and fertilization. Sufficient information is not available regarding the aetiological and therapeutic aspects of tubal affections, as a cause of infertility or sterility in bovines, because of difficulty in detecting tubal abnormalities clinically

Roberts (1971) stated that the fallopian tube disorders and its diseases probably occurred more commonly than generally assumed and diagnosed. It is for this reason that the assessment of tubal patency has been generally considered, as one of the essential tests of infertility investigation. Therefore, the proposed investigation was undertaken to study tubal patency, salpingography and histopathology of oviducts in slaughter house specimens of buffaloes.

MATERIALS AND METHODS

Morbid genitalia (309), obtained from freshly slaughtered she buffaloes at Haldwani Slaughter

House, were examined for recording of gross abnormalities and for the assessment, delineation of site and nature of blockade in the fallopian tube by uterotubal insufflation test, salpingography and tubal histopathology.

Tubal Patency Testing:

Each specimen of uterus (309) was insufflated with the help of syringe (Dispovan® - 50ml) through the cervical canal by passing a Foley's catheter (08 F) attached to a 3-way valve and an aneroid pressure gauge (Fig 1). The air was infused at the rate of 20 mm Hg per minute up to the maximum of 250 - 280 mm Hg pressure with the intermittent pause at 150 mm, 200 mm and 250 mm Hg pressure. A rapid fall in the intrauterine pressure (within few seconds) was considered as bilateral tubal patency, a slow fall (within 3 minutes) as unilateral patency and maintained pressure (for more than 3 minutes) at 250 mm Hg as bilateral blockade. Final diagnosis on patency status of oviduct was given above 250 mm Hg. The entire genital organ was submerged into water filled glass jar during insufflations. Bubbling of air through ovarian end of the oviduct also indicated patency status of the tube.

Figure and ins

Salping

also sub
lead ox
salpinx.
views)
radiogra
focal fil

Histopa

from sel
were co
were w
differen
embedd
of 4-5µ
stained
1951).

Gross A

(64.06%
having c
The sali
adhesior

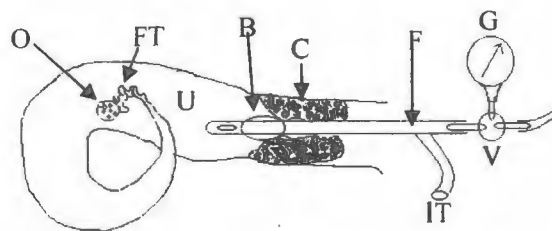


Figure 1 Diagrammatic representation of genitalia and insufflation system.

B	→	Balloon-tip
C	→	Cervix
FT	→	Fallopian Tube
F	→	Foley's Catheter
G	→	Pressure Gauge
IT	→	Inflator
O	→	Ovary
U	→	Uterus
V	→	Three-way Valve

Salpingography:

Selected genitalia (Patent and impatent) were also subjected to bilateral salpingography by injecting lead oxide suspension in soap-water in both the salpinx. The radiographs (in dorsoventral and lateral views) of the fallopian tube were taken using radiographic factors of 6.0 mAs, 45 kVp and 90 cm focal film distance (FFD).

Histopathological Investigation:

Small pieces of fallopian tube (about 1 cm.) from selected morbid genitalia (Patent and non-patent) were collected and fixed in 10% formalin. The pieces were washed in running tap water, dehydrated in different grades of alcohol, cleaned in benzene and embedded in paraffin blocks. The sections and sections of 4-5 μ were prepared by conventional method and stained by Hemotoxyline and Eosin (Lombard *et al.* 1951).

RESULTS AND DISCUSSION

Gross Abnormalities:

Out of 309 genitalia examined, 198 (64.06%) morbid genitalia of buffaloes were found having different type of gross abnormalities (Table 1). The salient pathological lesions evident were bursal adhesion (7.76 %), follicular cyst (5.82 %), luteal cyst

(5.17 %), ovarian hypoplasia (15.53 %), para-ovarian cyst (1.96 %), hydrosalpinx (3.88 %) and kinked cervix (23.94 %). A comparatively lower incidence of pathological lesions was observed by Shalash and Salama (1960). This finding was comparable with the previous finding of Dinc and Gular (1987) and Khan *et al.* (1992).

Air Insufflation Test:

Patency status of fallopian tubes at various levels of air pressure has been shown in Table 2. The final diagnosis of patency was made at a pressure above 250 mm Hg. Hence, the results are described in details at this pressure only.

Based on the final diagnosis at air pressure above 250 mm Hg, it may be concluded that unilateral patency, bilateral patency and bilateral blockade were in 39.15, 49.51 and 11.32% of 309 morbid genitalia studied. A total of 156 (50.49%) morbid genitalia were found having unilateral or bilateral blocked tube (Table 2).

A lower incidence of unilateral tubal patency was recorded by Kavani *et al.* (1982) and Khanna *et al.* (1995). However, Nagarajan *et al.* (1987) found higher incidence of unilateral tubal patency in buffaloes.

Koike and Kawate (1959) reported 48.93% (23) bilateral patency in cows, which was comparable with our finding. However, lower incidence was reported by Nair and Raja (1977) and Duchateau and Whitmore (1978).

Out of 309 morbid genitalia studied, 11.32% bilateral blockade was observed in our study. Khanna *et al.* (1995) reported 14.63% bilateral blockade in buffalo genitalia, which was comparable with our finding. Higher incidence of bilateral blockade was reported by Nagarajan *et al.* (1987) and Chenna Gowda and Abdulla Khan (1975). However, lower incidence of bilateral blockade in buffalo genitalia was observed by Kavani *et al.* (1982).

Salpingography:

Course of the fallopian tube from isthmus to os abdominalis has been delineated in the patent and impatent specimens. Out of specimens having impatent oviducts, right

Table 1: Occurrence of gross abnormalities in the bovine morbid genitalia (N=309).

Sl. No.	Diagnosis	Number of genitalia	Per cent
1	Bursal adhesion	24	7.76
2	Follicular cyst	18	5.82
3	Luteal cyst	16	5.17
4	Ovarian hypoplasia	48	15.53
5	Paraovarian cyst	6	1.96
6	Hydrosalpinx	12	3.88
7	Kinked cervix	74	23.94
Total		198	64.06

Table 2. Overall tubal patency at different ranges of pressure by air insufflation test (N=309)

Range of pressure in mm of Hg	Observation	Patency	No. of Genitalia	Per cent
0 - 150	Slow	Unilateral patency	15	4.85
	Rapid	Bilateral patency	12	3.88
	Maintained	Bilateral Blockage	282	91.62
150 - 200	Slow	Unilateral patency	89	28.80
	Rapid	Bilateral patency	67	21.08
	Maintained	Bilateral Blockage	153	49.51
200 - 250	Slow	Unilateral patency	99	32.04
	Rapid	Bilateral patency	156	50.48
	Maintained	Bilateral Blockage	54	17.48
Above 250	Slow	Unilateral patency	121	39.15
	Rapid	Bilateral patency	153	49.51
	Maintained	Bilateral Blockage	35	11.32

side tubal patency and left side blockade has been shown in Fig. 1. Bilateral tubal patency has been shown in Fig. 2. based on contrast-salpingography of morbid genitalia having patent oviducts. No such work has ever been carried out previously in farm animals. Thus, there is no scope of matching this piece of work for the sake of discussion.

Histopathological Study:

Histopathology of selected fallopian tubes revealed normal lumen with mucinous deposits, suppurative and non-suppurative salpingitis of different durations (acute, subacute and chronic). In acute salpingitis cases, loss of cilia, focal desquamation of epithelium and haemorrhage along with deposition of inflammatory cells were observed in the lumen i.e. acute salpingitis. Hydrosalpingitis was characterized by

epithelium showing hazy appearance (Fig. 3). The tips of some folds with leucocytic infiltration could be observed. However, degeneration and desquamation were more prominent in suppurative cases (Fig. 4). In chronic salpingitis cases, the salpinx, mesosalpinx and ovary commonly revealed adhesions to one another to a variable

extent depending on severity of the lesions and desquamation and degeneration of epithelium along with deposition of inflammatory cell suggestive of pyosalpingitis (Fig. 4). Similar findings of suppurative salpingitis and pyosalpinx have also been reported by Lombard et al. (1951) Sharma et al. (1968), Kavani et al. (1982; 1986).

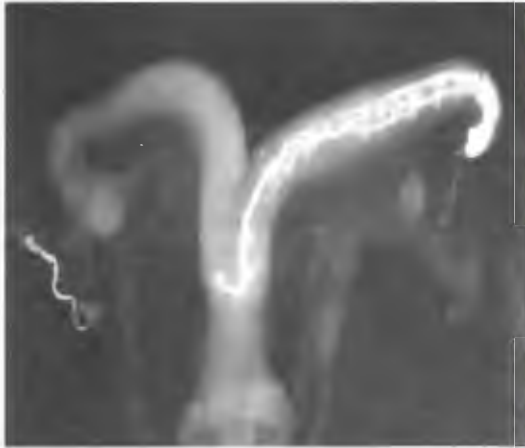


Fig 1. Contrast-salpingography on morbid genitalia showing right side tubal patency and delineation of left side blockade (ventrodorsal position).

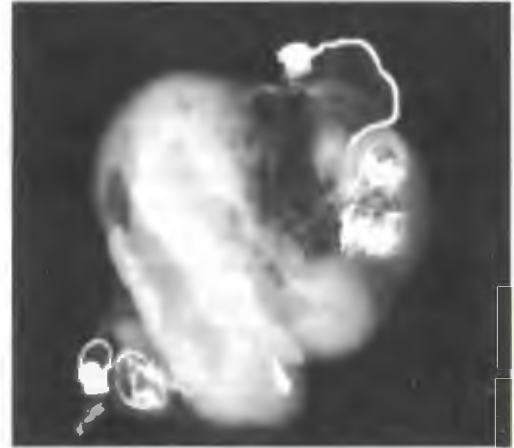


Fig 2. Contrast-salpingography on morbid genitalia showing bilateral tubal patency.

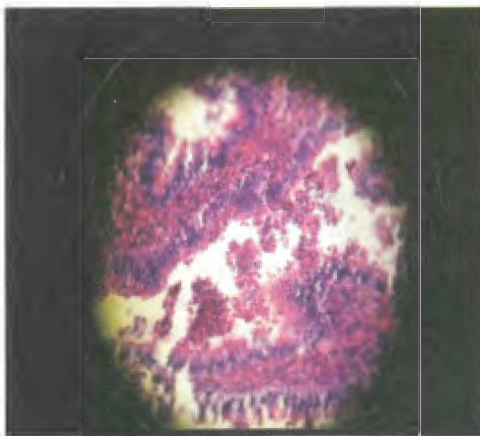


Fig 3. Broken epithelium with hemorrhage and hydrosalpingitis as epithelium shows hazy appearance (40 x10).



Fig 4. Desquamation and degeneration of epithelium along with deposition of inflammatory cells suggestive of pyosalpingitis (40 x10).

nt
85
88
.62
.80
.08
.51
.04
.48
.48
.15
.51
.32

fallopian
mucinous
suppurative
s (acute,
salpingitis
maturation of
ong with
e observed
salpingitis.
ized by

ACKNOWLEDGEMENT

The authors are thankful to Dean, College of Veterinary and Animal Sciences and Director, Experiment Station, G. B. Pant University of Agricultural and Technology, Pantnagar for the facilities provided. The authors are also thankful to In-charge slaughter house Haldwani for their help and co-operation.

REFERENCES

- Chenne Gowda, H. and Abdulla Khan, C. K. (1975). Tubal insufflation of excised bovine genitalia. *Mysore J. Agric. Sci.*, 9: 145-150.
- Dinc, D. A. and Guler, M. (1987). Post-mortem studies on genital organ lesions causing bovine infertility. *Veteriner Fakultesi Dergisi Seleuk Universitesi*. 3: 109-119
- Duchateau, A. B. and Whitmore, H. L. (1978). Uterine tube abnormalities in cattle. *J. Amer. Vet. Med. Assoc.* 172: 1308-1309.
- Kavani, F. S.; Bhavsar, B. K. and Kodagali, S. B. (1982). Studies on tubal patency in Surati buffaloes. *Indian J. Anim. Reprod.*, 2: 19-22.
- Kavani, F. S.; Heranijal, D. D.; Prajapati, K. S. and Kodagali, S. B. (1986). Histopathological investigations of genitalia in repeat breeder cows. *Indian J. Anim. Reprod.*, 7: 48-52.
- Khan, A. P.; Khan, T. M.; Basra, M. A.; Chaudhary, R. A. and Chaudhary, Z. I. (1992). A study on the pathology of internal genital organs of buffalo heifers. *Buffalo Bulletin*. 11: 36-38.
- Khanna, A. K.; Sharma, N. C. and Kali Charan (1995). Fallopian tube abnormalities in buffaloes. *Indian J. Anim. Sc.*, 65: 282-284.
- Koike, T. and Kawata, K. (1959). Studies on the tubal patency of the cow. I. Experiments made with slaughterhouse material. *Jap. J. Vet. Res.* 7: 61-69.
- Lombard, L.; Morgan, B. B. and McNutt, S. H. (1951). Some pathological alterations of the bovine oviducts. *Am. J. Vet. Res.* 12: 69-74.
- Nagarajan, V.; Neduncheralthan, B.; Kathiresan, D.; Quayam, S. A. and Thangaraj, T. M. (1987). The incidence of tubal abnormalities in she-buffaloes. *Cheiron*. 16: 137-140.
- Nair, K. and Raja, C. K. S. V. (1977). A preliminary study on utero-tubal insufflations of the bovine genitalia. *Indian Vet. J.* 54: 309-312.
- Roberts, S. J. (1971). *Veterinary Obstetrics and Genital Diseases (Theriogenology)*, 2nd Edn., Edward Brothers Inc., Michigan.
- Shalash, M. R. and Salama, A. A. (1960). Abnormalities of the genital system in buffalo-cows. *Dtsch. Tierarztl. Wschr.* 67: 44-45.
- Sharma, O. P.; Bhalla, R. C. and Soni, B. K. (1968). Studies on the abnormalities of ovarian bursa and oviduct in buffalo cows. *Indian Vet. J.* 45: 293-296.

Folli

S.SA7

cross
nor
Dur
Rec
nor
thre
0.34
the
day
two
14.6
diff
day

K

Follicular
mechanical
Gonadotrop
indicated as
when applic
ovulation a
1993). Duri
use of GnR
mid-dioestr
positively
(Townson
devoted to
utilize GnF
taurus cow
the incorpo

. Assistant Pro
. Associate Pr
. Professor and
. Professor. E
Madras
Veterinary Co
. Director of C