

**EFFECT OF CAESAREAN SECTION (C.S) ON AEROBIC  
BACTERIA OF GENITAL TRACTS OF NUBIAN GOATS**

By

**Badawi, M. E.<sup>1</sup> and Makawi, S. A.<sup>2</sup>**

- 1- College of Veterinary Medicine and Animal Production, Sudan University of Science and Technology.
- 2- Department of Obstetrics and Gynaecology, Faculty of Veterinary Medicine, University of Khartoum, P.O. Box 32 Khartoum North.

**ABSTRACT**

A total of 82 deep cervical swabs were collected from 10 post-parturient Nubian goats. Thirty eight (38) of these swabs were from five Nubian goats which have kidded normally (control group) and 44 swabs were from post-parturient Caesarean sectioned Nubian goats (C.S group). Collection of the swabs started from the second day after kidding till the goat came into the first observable heat. The number of isolates from the swabs taken from the two groups of goats reached 104, belonging to 10 different genera. They included *Bacillus spp*, *Bordetella spp*, *Corynebacterium spp*, *Escherichia spp*, *Gemella spp*, *Klebsiella spp*, *Micrococcus spp*, *Proteus spp*, *Staphylococcus spp* and *Streptococcus spp*. The organisms which were common between the two groups included: *Bacillus cereus*, *Escherichia E.coli*, *fergusonii*, *Staphylococcus chromogens* and *Streptococcus faecalis*.

It could be concluded from this study that, the most likely, pathogenic organisms isolated during the post-partum period were more frequent in C. S. goats compared to those goats kidded normally.

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## INTRODUCTION

Caesarean section is the removal of the foetus through an incision in the abdominal wall, at the time of parturition, when it can not be delivered in the normal manner, (O'Connor,1982). It is considered as the main obstetrical procedures for incidences of dystocia in sheep and goats because foetotomy in these animals is impossible (Noakes et al., 2001). At parturition, and immediately post-partum, the vulva is relaxed and cervix is dilated thus allowing bacteria to gain entry into the vagina, and the uterus thereafter. A wide range of bacteria could be isolated from the uterine lumen, Elliott et al., (1968) identified 33 different species. the most frequently encountered isolates being *Corynebacterium pyogenes*, *E.coli*, *Streptococci* and *staphylococci* (Johaans et al.,1967; Elliott et al.,1968;Griffin et al.,1974) The last authors stressed that the bacterial flora fluctuated as a result of spontaneous contamination, clearance and recontamination during the first 7 weeks post-partum. Quantitative and qualitative bacteriology of reproductive tract of oestrous ewes, after induction of embryonic death included: *Corynebacterium pyogenes*, *Bacillus species* *Staphylococcus species*, *Streptococcus species*, *Enterococcus species*, *Chromobacter species*, *Alcalegenes*, *E.coli*, *Pasteurella multocida*, *Proteus.spp* and unidentified bacilli (Sawyer,1977). Bacterial growth was observed in cultures of 90.91% of the vaginal and uterine swabs collected from goats with dystocia delivered by C.S (Sharma et al., 1998).

## MATERIALS AND METHODS

### Location:

This experiment was conducted in the Sudan University, Khartoum North, at a latitude of 15° 37' N, longitude 32° 32' E and 376 metres above sea level.

### Animals:

Ten (10) Nubian goats at their late stage of pregnancy were allotted to this experiment. They were between 3 to 4 years old, body weigh between 40 to 50 kg and parity between 2-3 kiddings.

#### Husbandry and management:

The animals were housed in an open-side shed. The roof was 3.0 metres high constructed with corrugated iron sheets, located in Sudan University Farm. The animals were fed on a concentrate ration offered once daily, green alfalfa and water given *ad-libitum* the animals were allowed to exercise and graze once a week in an adjacent field of green alfalfa and sorghum grass (Abu 70). Endo-parasites were controlled by monthly injection of Ivermectin (1mg/50kg 1/m , Ivotek , Star Laboratories PVT , Pakistan).

#### Experimental design:

The animals were divided into two equal groups (5 animals each). These two groups were randomly assigned to two treatments:

Group (A): constituted the control group in which Nubian goat gave birth normally without assistance.

Group (B): embraced the Nubian goats which were subjected to caesarian section (C.S. group).

#### Caesarean section:

Caesarean section was performed, according to Noakes et al. (2001), through a left flank incision under paravertebral, inverted L-shaped nerve block or by local infiltration analgesia with the animal in right lateral recumbency.

#### Sample collection:

A total of 82 deep cervical swabs comprising 38 deep cervical swabs from the control group and 44 swabs from the operated group (C.S. group).

The swabs were taken starting from day 2 after parturition, then continued at intervals of 3-5 days till the last goat came into the first observable oestrus, when no isolates were recovered from the last samples.

#### Bacteriological procedures:

The swabs were smeared directly on blood agar and McConkey agar and the isolates were identified according to Barrow and Feltham (1999).

#### Statistical analysis:

Statistical Package for Social Science (SPSS. 10-05, Inc. 1999) was used for comparison of means.

## RESULTS

### **Organisms isolated from total samples:**

A total of 104 isolates were recovered from 82 cervical swabs collected from the post-parturient Nubian goats. Twenty nine species were isolated from the total samples, most of them were: *E.coli*, *Staphylococcus spp*, *Streptococcus spp* and *Proteus spp*.

### **Organisms isolated from the control group:**

Fourty two isolates were recovered from 38 cervical swabs collected from the control group. Sixteen organisms belonging to seven genera, were isolated including; *Bacillus spp*, *Escherichia spp*, *Gemella spp*, *Klebsiella spp*, *Micrococcus spp*, *Staphylococcus spp* and *Streptococcus spp*. The distribution and frequency of the isolates are shown in table (1).

### **Organisms isolated from the C.S group:**

Sixty two isolates were recovered from 44 cervical swabs collected from the C.S group. Eighteen organisms from eight genera were isolated including: *Bacillus spp*, *Bordetella spp*, *Corynebacterium spp*, *Escherichia spp*, *Micrococcus spp*, *Proteus spp*, *Staphylococcus spp* and *Streptococcus spp*. The distribution and frequency of the isolates are shown in table (2).

From tables (1) and (2), it is shown that only five organisms were common between the two groups and those isolates include: *Bacillus cereus*, *E.coli*, *Escherichia fergusonii*, *Staphylococcus chromogens* and *Streptococcus faecalis*. The genera isolated from the control group alone included: *Gemella spp* and *Klebsiella spp* and those isolated from C.S group only included: *Bordetella spp*, *Corynebacterium spp* and *Proteus spp*.

**Table (1): Distribution of bacteria isolated from the control group.**

No	Isolates	Frequency	Percentage
1-	<i>Bacillus cereus</i>	2	4.76 %
2-	<i>Bacillus licheniformis</i>	1	2.38 %
3-	<i>Bacillus pumilus</i>	1	2.38 %
4-	<i>E. coli</i>	13	30.95 %
5-	<i>Escherichia fergusonii</i>	1	2.38 %
6-	<i>Gemella haemolysans</i>	2	4.76 %
7-	<i>Klebsiella oxytoca</i>	1	2.38 %
8-	<i>Micrococcus kristinae</i>	3	7.14 %
9-	<i>Staphylococcus chromogens</i>	3	7.14 %
10-	<i>Staphylococcus klossii</i>	2	4.76 %
11-	<i>Staphylococcus saccharolytics</i>	2	4.76 %
12-	<i>Staphylococcus saprophyticus</i>	2	4.76 %
13-	<i>Staphylococcus schleiferi</i>	1	2.38 %
14-	<i>Staphylococcus sciuri</i>	1	2.38 %
15-	<i>Staphylococcus simulans</i>	1	2.38 %
16-	<i>Streptococcus faecalis</i>	6	14.29 %
	<b>Total</b>	42	100 %

**Table (2): Distribution of bacteria isolated from the C. sectioned group.**

No	Isolates	Frequency	Percentage
1-	<i>Bacillus cereus</i>	1	1.61 %
2-	<i>Bacillus mycoides</i>	1	1.61 %
3-	<i>Bordetella parapertussis</i>	1	1.61 %
4-	<i>Corynebacterium diphtheriae</i>	2	3.23 %
5-	<i>Corynebacterium pilosum</i>	1	1.61 %
6-	<i>Corynebacterium pseudodiphthericum</i>	1	1.61 %
7-	<i>Corynebacterium pseudotuberculosis</i>	1	1.61 %
8-	<i>E. coli</i>	15	24.19 %
9-	<i>Escherichia fergusonii</i>	2	3.23 %
10-	<i>Micrococcus leutus</i>	1	1.61 %
11-	<i>Proteus mirabilis</i>	10	16.13 %
12-	<i>Proteus penneri</i>	2	3.23 %
13-	<i>Staphylococcus carnosus</i>	1	1.61 %
14-	<i>Staphylococcus chromogens</i>	16	25.81 %
15-	<i>Staphylococcus lentus</i>	1	1.61 %
16-	<i>Streptococcus faecalis</i>	4	6.45 %
17-	<i>Streptococcus pneumoniae</i>	1	1.61 %
18-	<i>Streptococcus uberis</i>	1	1.61 %
	<b>Total</b>	62	100 %

## DISCUSSION

At parturition, and immediately post-partum, the vulva is relaxed and the cervix is dilated thus allowing bacteria to gain entry into the vagina and the uterus. A wide range of bacteria may be isolated from the uterine lumen, Thirty three different species were identified, those most frequently isolated being *Corynebacterium pyogenes*, *E.coli*, *Streptococcus spp* and *Staphylococcus spp* (Johaans et al., 1967; Elliott et al.,1968; Griffin et al., 1974). From the present study 29 species were isolated during the post-partial period in normally kidded and C. sectioned Nubian goats. The most frequently isolated organisms were: *E.coli*, *Staphylococcus chromogens*, *Proteus spp* and *Streptococcus faecalis*. These findings are similar to those found in post-parturient cows except for *Proteus spp* which were isolated from three post-parturient operated Nubian goats, during the period between day 2 and day 31. Sawyer (1977) conducted an experiment to study quantitative and qualitative bacteriology of the reproductive tract of oestrous ewes, after induction of embryonic death, he succeeded to isolate *Corynebacterium pyogenes*, *Bacillus species*, *Staphylococcus species*, *Streptococcus species*, *Enterococcus species*, *E.coli*, *Chromobacter species*, *Alcalegenes*, *Pasteurella multocida* and *Proteus spp*. This study showed that *Corynebacterium spp* were isolated from three post-parturient operated Nubian goats only during day 2, day26, day31 and day36. Most of *Staphylococcus chromogens* were isolated from the surgically operated Nubian goats (25.8 % for C.S Vs. 7.14 % for normal kidding), thus the frequency of pathogenic organisms in the C.S group were more than those of the control. This finding is similar to that of Sharma et al.,(1998) who reported that, 40 % of the organisms isolated from vaginal swabs collected from 5 goats at caesarean section were Gram-positive cocci.

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