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Application of Caslick's Index in Predicting the Mare Fertility

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ABSTRACT

Vulva acts as the first effective barrier to combat the external environmental infections and to protect the internal reproductive organs from ascending infections. Any abnormality in the shape and structure to the vulva may compromise the mare's healthy reproductive status and may lead to the infertility. Vulvar conformation plays a major and crucial role not only during selection and purchase of mares but also in predicting the future fertility status. Caslick's index gives estimation about the calculation of good vulval conformation. In the present study, we applied the same to our breedable mares present at the farm and correlated with fertility. The study confirms the positive correlation between the vulval confirmation and fertility status of the mares.

Keywords: Caslick index, Mare, Fertility, Cervical abnormalities, Vulvar conformation.

Mares have long gestation period of around 10 months and could give rise to single offspring after foaling. The reproductive health status is important aspect in making a mare pregnant. Management practices like estrus detection and mating /inseminating at right time play a vital role in making a mare pregnant.

The fertility rate of mare is very low when compared the other domestic species (Pascoe, 1979). So, in obtaining a foal per year, both managerial practices and scientific approaches of breeding play a pivotal role in economical equine husbandry. As infection of the reproductive tract is a major cause of endometritis, preventing such infection is very important with regards to the mare fertility. If the mare has good reproductive tract conformation, natural protection is provided. However, many mares have poor conformation and bacterial invasion of the reproductive tract arises when the natural defenses/seals fail. If the vulval seal is high (more than 4 cm of length dorsal to the pelvic floor) in relation to the pelvic brim, the vestibular seal is incompetent and aspiration of air (pneumovagina) and the aspiration of bacteria and contaminated material into the vagina can occur (Pycocock, 1993).

The initial vaginitis may lead to cervicitis and acute endometritis resulting in sub/infertility (Ricketts,1987). Contamination of the caudal reproductive tract with bacteria during pregnancy can result in early embryonic death and in late pregnancy can result in the development of placentitis which may lead to abortion and compromise the health status of mare. Furthermore, the pneumovagina may lead to urovagina (accumulation of urine within vagina) when the vestibule and urethral opening are displaced cranially (Hemberg *et al.*, 2005). Hence while purchasing/selecting the mares Caslick index will certainly be an important factor which has definite effect on the mare's future fertility and breeding performance.

MATERIALS AND METHODS

For the present study 20 cyclic, breedable and healthy mares aged from 5 to 10 years located at Equine Production Campus, Bikaner, Rajasthan were selected. All the animals were maintained under uniform housing and feeding managerial conditions. To find out the Caslick's index both the length of the vulva and angle of inclination of vulva in relation to anal sphincter were measured with the

Table.1. Caslick's index and fertility index of the mares with different age.

Age of mare (months)	Length of vulva (cms)	Caslick's index	Fertility Index
61	4.7	70.5	1
63	4.9	73.5	1.5
63	4.6	46	2
65	5.8	58	1.5
68	5.6	112	2
72	5.5	110	2
76	6.1	91.5	1.5
80	6.0	120	2
82	7.2	108	2.5
82	7.4	133.2	3
84	7.8	156	2.5
86	8.1	178.5	2.5
86	9.8	268.8	2.5
90	9.6	270	3.5
98	9.8	254.6	3
98	10.2	306	4
98	10.2	357	3.5
106	11.1	377.4	4
118	10.7	394.8	4.5
120	11.9	378.4	5.5

help of measuring tape, scale and thread as described by Pascoe (1979).

Caslick's Index = length of vulva X angle of vulva

All the animals were also examined with an ultrasound machine for any uterine infection and for any other abnormalities. The breedable mares were closely monitored ultrasonographically for their cyclicity and inseminated with frozen thawed stallion semen. For unifying the conditions and to reduce the variability between the observations, all the mares were inseminated with single stallion semen cryopreserved at ideological situations, but the inseminations were carried at various seasons during two to three years of duration. The fertility index was calculated as the number of inseminations required to get the mare conceived.

RESULTS AND DISCUSSION

As per the mentioned objective the length of vulva and angle of inclination vulva were calculated and listed in Table no.1. The Caslick's index was correlated against the fertility index and is detailed in Table no.1. All the mares were also examined ultrasonographically for any uterine infection and abnormalities like pneumovagina and endometritis. In mares with above 12 years age , mild uterine infection and endometritis was detected, however it was not the case with the mares below 12 years of age.

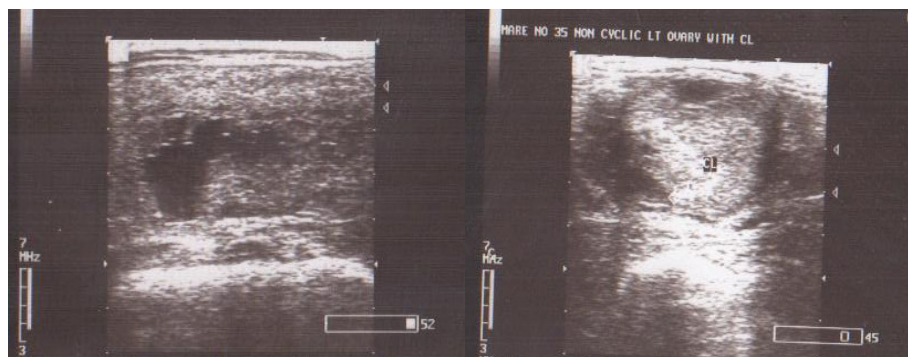


Figure 1. Ultrasonographic detection of pneumovagina in an old mare and persistent corpus luteum on the corresponding ovary

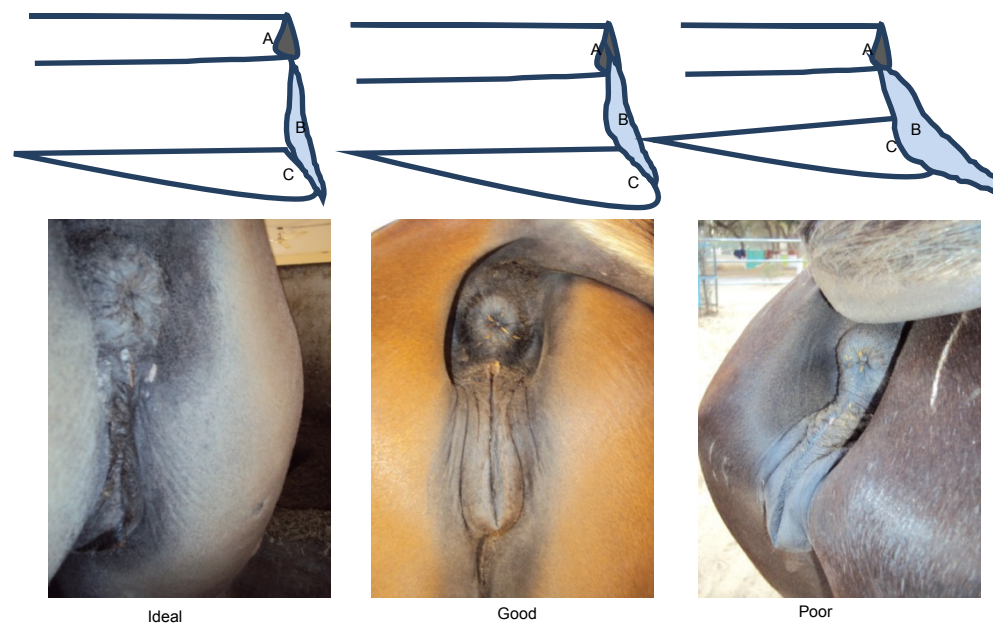


Figure 2. Ideal, Good, and Poor conformations of vulva with pictorial depiction in the mare (A: Anal sphincter, B: Reproductive tract, C: Level of ischium)

In an ideological situation Caslick's index below 300 doesn't need much attention and surgical input (Caslick, 1937; Pascoe, 2006). We could also detect pneumovagina and uterine infection in two mares of about 15 and 18 years of age.(data not shown) at field conditions and their Caslick's index score was more than 400 (Fig.1). The history from the owners reveals that these mares were repeat breeders.

From the present study it was observed that the age of the mare and fertility index are positively correlated to Caslick's index and in both cases it was statistically non-significant. The present findings in this study also correlate with previous studies (Caslick, 1937; Pascoe, 1979; Hemberg *et al.* 2005).

The likely explanation and reason for having high Caslick index in older mares is as the age and parity of the mare increases, the inner reproductive tract comprised of cervix, uterus and ovaries naturally tends to fall deeper into the abdominal cavity as the broad ligaments will be stretched which supports the structures for the uterus (McKinnon and Vasey, 2006). During this situation, mare's pelvis becomes lower and the vagina slopes down towards the cervix,

allowing passed urine to collect in the cranial vagina, but not passed through the vulval commissure. This detained urine provides a niche for bacteria and progressively may lead to an ascending infection which may in future turn out to be endometritis and infertility conditions (Allen and Newcombe, 1979; Frauenfelder, 1987).The defect in poor conformation of the vulva and perineum can be corrected by Caslick's vulvoplasty to prevent the aspiration of air and thus we can reduce the amount of infection and inflammation in the mare's reproductive tract (Evans,*et al.*, 1980; Wingfield Digby, *et al.*, 1982).

CONCLUSION

From the present study it is found that there is a positive correlation between the vulval confirmation and fertility status of the mares. And it is also found that Caslick's index is related to the age and parity of the mare. It can be concluded that Caslick's index is an important factor in predicting the fertility status of mare and one has to consider the physical confirmation in judging the health and reproductive status of a mare.



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