Hysteroscopic Evaluation in Subfertile Turkaman Cross-Bred Mares

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Endoscopic, cytologic, bacteriologic and histologic examinations of the endometrium were performed on 34 subfertile Turkaman cross-bred mares to evaluate the significance of the hysteroscopic method and biopsy as a gynaecological evaluation. Fifty percent of the mares showed pathological changes on endoscopy, including adhesions, fluid accumulation, endometrial cysts and atrophy of the endometrial folds. Three, 23 and 8 cases classified as grades II A, II B and III, respectively, in biopsy samples base on the Kenney and Doig classification [11]. Multiple endometrial cysts occurred in 12 mares (35.3%) and 2 of them were younger than 10 years. Most of the large lymphatic cysts were situated near the bifurcation of the uterine body. Adhesions were found only in one mare. Only 4 of the 17 cases in which endometritis was clearly diagnosed were identified by endoscopy, but none of the endometrial cysts or intraluminal adhesions which were identified by endoscopy were determined by uterine biopsy, cytology and culture. In view of the results of this experiment, it can be concluded that in diagnosing endometritis, biopsy, cytology and culture of the endometrium is more diagnostic than endoscopy, but in differentiating gross pathological changes in the uterus such as intrauterine adhesions and endometrial cysts, endoscopy is more efficient.

Key words: hysteroscopy, endoscopy, uterine biopsy, mare

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To maximise breeding efficiency, all barren mares should receive a thorough gynaecological examination after the end of each breeding season [20]. Evaluation of the barren mare includes a visual observation of the vulva, vagina and cervix, rectal palpation and ultrasound scanning of the uterus and ovaries, and cytological and microbiological examinations of the endometrial surface [5].

Endoscopy can be used to evaluate fertility in abnormal or otherwise apparently normal mares [9]. Examination of the uterine lumen through a flexible fiberoptic instrument or video endoscope can be a valuable diagnostic procedure [16]. In mares hysteroscopic examinations have been performed with rigid and flexible fiberoptic endoscopes, mainly as an adjunct to the fertility evaluation of barren mares or to

visually examine the effects of intrauterine treatments [24]. In mares with palpable defects, discharges or unusual ultrasonographic examinations, the endoscope can aid in the diagnosis, treatment and prognosis [9]. Videoendoscopic evaluation of the subfertile mare's uterus has been performed successfully [5]. It has seen rapid development in endoscopic design, application and technique [3]. This study was conducted to evaluate the significant application of hysteroscopy in subfertile Turkaman cross-bred mares.

Materials and Methods

During a period of one year (1994–1995), Turkaman cross-bred mares (n=34) aged 4–7 years which were barren for one or more years were examined. The breeding history of each mare was recorded. In early estrus after rectal inspection, the perineal area was cleaned thoroughly, and then bacterial and cytological

swabs were collected from the endometrium with two sterile double guarded uterine culture swabs (Equi-Vet swabs), respectively, which were introduced into the uterus manually with sterile gloves [13, 19, 21]. Bacterial swabs were placed in brain heart medium and brought to the laboratory within 24 hr for aerobic culture. Cytological swabs were obtained from the endometrium and luminal contents. Swabs were exposed by pushing against the guard and opening the caps. All the tubes were then rotated briskly several times. This caused the cap to collect a sample of the endometrium and uterine fluid [7, 10, 15]. The swabs were rolled onto microscope slides and rapidly fixed in methanol, stained with Giemsa solution and examined under a light microscope.

Fiberscope model VFS-3 (Arnold Company, USA) with an operating length of 110 cm, an outer diameter of 1 cm and biopsy channel diameter of 0.3 cm was used in combination with a video camera recorder (Video 8, ccd-F500E) (Sony handycam, Japan), a Sony television monitor and model 1185A-150 Watt EJA illuminator (Schott fiber optic Inc. Co., USA).

Endometrial biopsy samples were taken with rigid Yeoman biopsy forceps from the dorsal wall of the endometrium near the bifurcation site. Tissue samples were fixed 12–24 hr in Bouin's fluid and then transferred to 10% formalin and kept for 24 hr, embedded in paraffin, cut into 5 micro-meter thicknesses and stained with haematoxylin-eosin. They were categorized into I, IIA, IIB, III based on the modified four-category system (Kenney and Doig, 1986) [11]. In mares with gross abnormality in the uterus found in rectal palpation or endoscopic evaluation, a further biopsy was taken from the affected site.

Results

In endoscopic evaluation, 17 of the 34 barren mares (50%) had shown pathological changes which included adhesions, fluid accumulation, endometrial cysts and atrophy of the endometrial folds. Three, 23, and 8 cases were classified in grades IIA, IIB and III respectively based on the Kenney and Doig classification [11]. Multiple endometrial cysts occurred in 12 mares (35.3%). They were individual or multiple spheroidal or cylindrical structures, either pedunculated or sessile, and of various diameters. Most of the large lymphatic cysts were situated near the bifurcation of the uterine body. Two of the 12 mares with cysts were younger than 10 years. Adhesions were found in only one mare.

Discussion

In the present study, of the 34 evaluated mares with histories of subfertility, 3 showed signs of an endometrium with only negligible pathological changes (grade IIA), which may indicate that other causes can be responsible for their subfertility. It was reported that 13 cases out of 78 subfertile group mares (16.6%) had normal histological architecture of the endometrium [5]. It was stated that a history of recurrent endometritis provided a more sensitive and specific indicator of susceptibility to uterine infection than a uterine biopsy [22]. This could be due to the percentage of subfertile mares showing no significant pathological changes with the biopsy method.

Fifty percent of the subfertile mares showed visual pathological changes in endoscopic evaluation, whereas Bracher and Allen reported that 56% of cases show visual endometrial pathological changes in subfertile group mares [5]. Endoscopy was reported to be helpful in determining the cause of infertility in 26 of 40 problem mares (65%) [18]. The defects in endoscopic diagnosis may be due to either the prevalence of uterine problems in subfertile group mares of the inexperience of the practitioner. Therefore in applying endoscopy to determine infertility in mares, the experience of the practitioner plays an important role in interpreting the results.

Causes of intraluminal adhesions, including trauma or intrauterine administration of irritant solutions etc, reports to be in the range of 8% [5] to 20% [18], but in our study only a 3% incidence of intraluminal adhesion was observed.

Endometrial cysts have been seen in 35.3% of subfertile cases. In another study, 48 out of 87 infertile mares were reported with endometrial cysts [5]. Most of the large lymphatic cysts were situated near the bifurcation of the uterine body. It was stated that most lymphatic cysts are situated in the mid to distal portion of a horn or at the bifurcation of the uterine body [23]. Large lymphatic cysts may impede motility of the early conceptus, restricting the ability of the vesicles to prevent luteolysis after day 10. Later in pregnancy, contact between the cyst wall and the yolk sac or allantois may prevent absorption of nutrients [16]. In previous reports, the prevalence of endometrial cysts diagnosed by hysteroscopy was 13.4% in a mixed group of fertile and subfertile mares [17], 15% in a randomly selected group [1], and up to 55% in a group of subfertile mares [5]. It was suggested that a correlation exists between the

Table. Number of cases which were clearly diagnosed by the following methods in the mares examined

Diagnosis \ Method	Rectal palpation	Biopsy	Cytology and culture	Endoscopy	Total
Acute endometritis*	-	9**	9	2	9
Chronic endometritis	-	8	-	2	8
Uterine cysts	3**	-	-	12	12
Intraluminal adhesion	-	-	-	1	1

*Those who had positive results in bacteriological (when a large number of pure potentially pathogen bacteria were isolated [12, 14, 21]), cytological (when more than 1 neutrophils per 10 endometrial epithelial cells or more than 5 neutrophils in 10 fields (40X) were demonstrated or more than 2% of cells were neutrophils [7, 10, 15]) and biopsy examinations simultaneously, were considered as having acute endometritis [2, 7, 11, 21]. **Not definitely diagnosed.

Fig. 1. Suggested diagnostic steps in diagnosing subfertile mares.

occurrence of cysts and the mare's age [5].

Although it was stated that cysts only develop in mares 10 years or older [17], Bracher and Allen reported that 4 out of 48 mares (8.3%) with cysts were younger than 10 years [5]. In our study 2 out of 12 cystic mare (16%) were younger than 10 years.

As shown in Table, only 4 of the 17 cases in which endometritis was clearly diagnosed were identified by endoscopy but none of the endometrial cysts or intraluminal adhesions which were identified by endoscopy were determined by uterine biopsy, cytology and culture. In view of the results of this study we can conclude that in diagnosing endometritis, biopsy, cytology and culture of endometrium is more diagnostic than endoscopy, but in differentiating gross pathological changes in the uterus, such as intrauterine adhesions and endometrial cysts, endoscopy is more efficient.

It was stated that, although hysteroscopy cannot replace other diagnostic methods, especially in cytologic and histologic examination of the endometrium, certain conditions such as transluminal adhesions, focal aplasia, small endometrial cysts, tumours and abnormalities of

the uterotubal papillae cannot be detected by other methods [5]. The endoscopic findings must be correlated with additional investigations, including tissue biopsies and cultures, together with history and transrectal palpation findings [8].

The authors believe that in confronting mares which have no obvious signs of infertility, such as pus flow from the uterus, if rectal examination confirms a pathological change, such as an abnormal mass, endoscopic evaluation and direct biopsy is recommended and if no abnormality is palpated, a blind biopsy with culture and cytology can be helpful.

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