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Real-Time Ultrasonic Diagnosis of Pseudopregnancy in Goats and Treatment with Prostaglandins

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Abstract

The current study tries to estimate the prevalence of hydrometra in local goats and to evaluate ultrasonic diagnosis, treatment with Cloprostenol and fertility rate in goats. The study was carried out from March-2021 until April-2022. A total of 86 local goats which presented to the clinic College of Veterinary Medicine, the University of Diyala, for routine ultrasonic diagnosis of pregnancy were examined. Ten local goats,were diagnosed with hydrometra. All animals (n=10) have received (**250µg**) Cloprostenol. Six of these goats have responded to the treatment with Cloprostenol from the first dose (n = 6, Group I), while other (n = 4, Group II) have responded after the second administration with a one-week interval. The results revealed that the prevalence of hydrometra in local goats was (11.6%,10/86), and the responsive rate for Group I and Group II were (60%,6/10) and (40%,4/10), respectively. While the pregnancy rate was (66.7%,4/6) and (50%,2/4) for Group I and Group II, respectively, with highly significant differences between these two groups at (P≤0.01). In conclusion, it can be concluded that real-time ultrasound approach is a reliable, rapid and useful tool for diagnosis and follow-up of goats affected with hydrometra. Successful treatment of goat with hydrometra and subsequent fertility was achieved using two doses of Cloprostenol one week apart.

Keywords: ultrasound, goat, hydrometra, PGF2α

Introduction:

Hydrometra or pseudopregnancy is characterized by an accumulation of sterile fluids in the uterine lumen due to the persistence of one or more than one corpus luteum(CL)(1). Pseudopregnancy (hydrometra)is one of the main causes of subfertility or temporary infertility in goats((2,3). Any researchers worldwide reported it is occurrence in small ruminants and other animals (4,5). The pathophysiology and aetiology of hydrometra are not well explained and still not completely clarified(4) and always accompanied with the high level of progesterone, fertility failure, cessation of estrous cyclic activity as well as a variable degree of abdominal enlargement .Thus, the presence of fluids in the uterus is the result, but cause of a prolonged secretion of progesterone by the corpus luteum (6), may be due to a failure of the luteolytic mechanism. According to (7) there are two main

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important mechanisms for hydrometra establishing: Firstly, is the spontaneous presentencing of the CL after the failure of fertilization and secondly, is the persistence of CL subsequently an early embryonic death., the indication that at least 50% of the cases of hydrometra in goats establishing as a consequence of embryonic death that takes place at a gestational period of about 40days(8).

Furthermore, other causes might be associated with undiscriminating hormonal applied or mating outside the season of breeding(9). However, this can furthermore be observed in goats with synchronized estrus or ovulation and also whether or not goat have been breeding(8), being challenging to established a profile. Nonetheless, Hesselink and Elving (10),it is identified that a genetic influence on its incidence ,the physiological and hormonal changes(mostly do not existent estrus and occasionally show enlargement abdomen) are constant with pregnancy and owners are convinced the doe is pregnant ,therefore, the case of hydrometra affect the kidding interval, fertility, kidding rate and reducing the milk yield of the herd(11).

Hydrometra clinically called pseudopregnancy before the introduction of B-mode ultrasound ,due to the absence of equipment would permit a more accurate diagnosis(9). Ultrasound has to establish a new dimension in the reproduction of animals by allowing not only determining physiological conditions of reproductive tract but also, the diagnosis of reproductive tract disorders like mucometra, hydrometra and pyometra (12,13). The treatment of hydrometra involves drainage of fluids from the uterus and return doe to estrus usually by administration of prostaglandin $F_2\alpha$ (PGF2α) or a synthetic PGF2α analogue that leads to luteolysis of corpus luteum and then emptying of the uterus(2,9). The current study aimed to estimate the prevalence of hydrometra in local goats and to evaluate ultrasonic diagnosis, and fertility rate in goats treated with Cloprostenol

Materials and methods:

The present study was conducted in the College of Veterinary Medicine-University of Diyala from March-2021 to April-2022. During this period eightysix local goats presented to the clinic of the College for routine ultrasonographic pregnancy diagnosis. Ten multiparous goats(2-5year) were diagnosed with hydrometra, the ultrasonic images were obtained by trans-abdominal ultrasound(TAUS) using Sector transducer (3.5-5MHz) , according to(14), and trans-rectal ultrasound (TRUS) examination with linear probe(5-7.5MHz), the probe was fastened to a plastic curved rod (length 40cm;2cm in diameter) , were

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conducted, using a B-mode ultrasound scanner (Welld ultrasound, Shenzhen well. D. Medical Electronics Co. LTD. China) and the animal turned on the left lateral position, area of scanning extended across the right ventral abdomen front of the udder for TAUS and in standing position for TRUS .

estrus was allowed to take place spontaneously. The remaining 4cases(Group-II) were responding after the second administration of treatment, one week apart .The pregnancy rate was confirmed by ultrasonic pregnancy diagnosis between 50-60days after natural mating .The percentage of responses and pregnant animals in two groups were compared by the Chi-Square (χ^2) test and the differences were taken as statistically significant at $P \leq 0.01$(15).

Results:

The current study observed that the overall prevalence of hydrometra in local goats was (11.6%,10/86). Four of these animals (40%,4/10), developed

All animals (n=10), diagnosed with hydrometra were treated with one dose intramuscularly of PGF2α analogue(250 µg Alfaglandin-C ;Cloprostenol sodium, alfasan, Holland).In 6 cases (Group-I) no further treatment required after the uterine drainage and

hydrometra after applied estrus synchronized program while other four goats (40%,4/10)showed the case hydrometra as subsequent of early embryonic mortality after 40days of gestation. The remaining does (2/10, 20%) were developed hydrometr spontaneously. All the goats were diagnosed with hydrometra, showed variable abdominal dilation. The ultrasonographic diagnosis of hydrometra was depended on the presence of anechogenic intrauterine fluids with the stretching hyperechgenic lines from uterine wall which lead to traversed the anechoic areas (figure-1,A and B).

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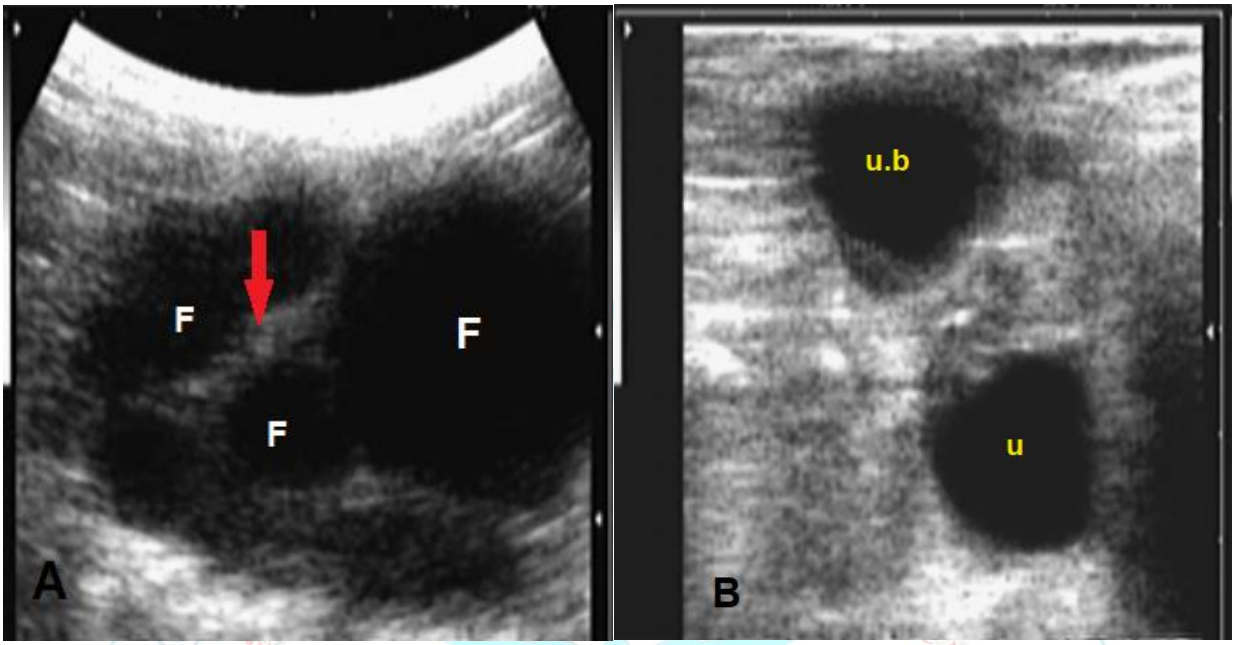

Figure- 1:Transabdominal(A) and transrectal(B) ultrasonic imaging showing of anechogenic fluids (F). Goat presenting well-developed hydrometra before treatment with prostaglandin, stretching hyperechogenic lines (red arrow),urinary bladder(u.b) uterus(u)

Group-I (6/10, 60%), were responded successfully to the first administration, while Group-II (4/10, 40%) were responded after second dose of treatment with one-week interval, as judged by TRUS and TAUS (figure-2, A and B).

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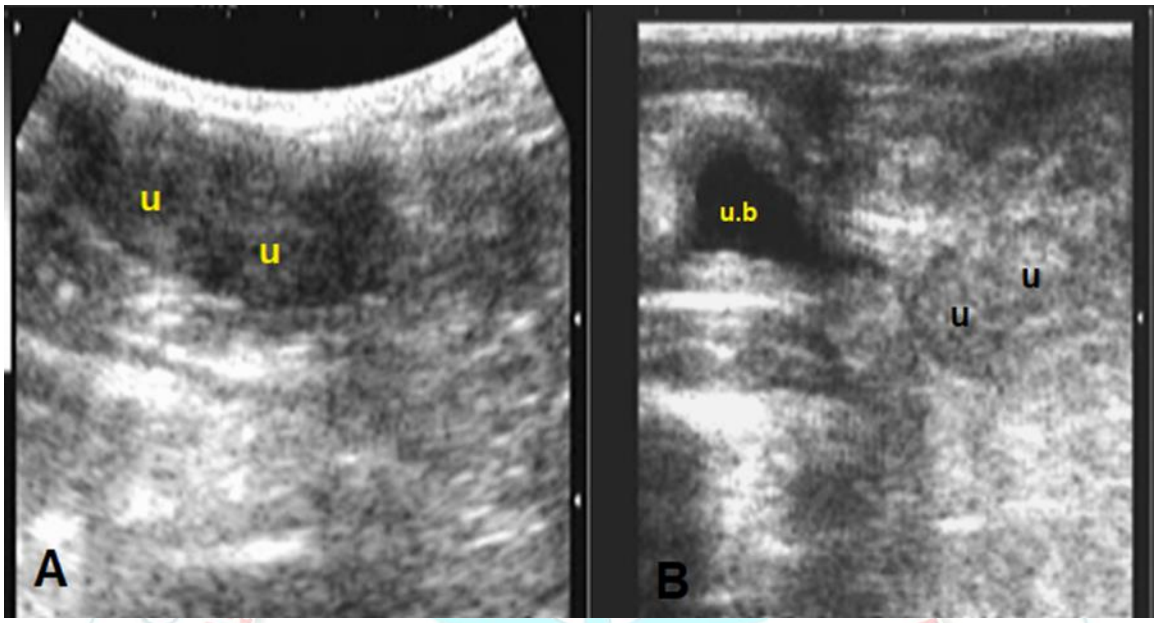

Figure- 2 : Transabdominal (A) and Transrectal (B) ultrasonic imaging showing of complete uterine drainage . Seven days after prostaglandin treatment; urinary bladder (u.b); uterus (u)

The differences between the two groups in the rate of responding and pregnancy were high significant (P≤0.01). The pregnancy rate in Group-I and II were (66.6%,4/6) and (50%,2/4), respectively(table-1).

Table-1: Pregnancy and responding rate in Goats affected by hydrometra after treatment with prostaglandin $F_2\alpha$

Parameter	Group-1 (one dose of PGF2α)	Group-2 (two doses of PGF2α)
Responding rate	60%(6/10)	40%(4/10)**
Pregnancy rate	66.7% (4/6)	50%(2/4)**
** (P≤0.01).		

Discussion:

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In the present study, the results revealed that diagnosis of hydrometra can easily be made by transabdominal ultrasonography(TAUS), these results were confirmed by previous researchers (16,17), and also by transrectal ultrasound(TRUS)(18) who found that the TRUS was useful to confirm the prevalence of hydrometra in goats. Our images obtained by an ultrasonic diagnosis of hydrometra is based on detection of fluids in the uterine lumen with the absence of placentomes and fetus, which agrees to the results by the previous (5,13,19). Our current results were in agreeing with the findings of (20) when he reported that the TAUS approach during the 40 and 70day after mating, yields data about pregnancy, the viability of fetus and multiple or single pregnancy, although at the same time making likely a reliable differential diagnosis of hydrometra .

According to the results of the present study, the prevalence of hydrometra in local goats was 8.6%. This result is slightly lower than observed of previous studies (17,18,21), who found that incidence of hydrometra was 9%,10.6% and 9.2%, respectively. It is also important to observe that prevalence of hydrometra obtained in the Saanen breed was 13.3% and 14.3% in the Moraes *et al.* ; Purohit (22,23), respectively. These results were much higher compared to the present of our study. The differences among previous studies could be attributed due to differences in management, environmental conditions and breed of animals. Batista *et al*. (25), founded that a genetic predisposition may have a role in the high prevalence of hydrometra. Although Moraes, *et al*. (23) and Purohit (24) who concluded that the incidence of a pseudopregnancy or hydrometra was higher in herds using hormonal protocols to induce ovulation or estrus synchronized with exogenous hormones. There observes were similar results in the current study. This study showed the hydrometra have frequently been detected in does as a consequence of fetal loss or death of the conceptus due to the retention of corpus luteum(CL), these results coincided with Maia *et al*.(17) ; Bisla *et al*.(26). The results reported by Moraes *et al*. (23) demonstrated that a single administration of PGF2α is not sufficient to drainage of fluids present in the uterus of goats (24). According to our study, the PGF2α is given in two doses to four animals to complete evacuation of uterine contents. In this study, re-initiation of reproductive cycles occur following treatment in both animals groups as reported previously by other researchers (12;2).

Overall, the treatment might lead to improve the fertility or pregnancy rate up to 60% (6/10) of the goats diagnosed

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with hydrometra. The results were a covenant with previous reports of Maia *et al*.(17)because the current study was conducted during the breeding season, the re-initiation of goats to estrous cyclicity which there were breeding and consequent conception after the second administration of Cloprostenol. Brom *et al* (1), mentioned that reproductive performance improves when the second dose of treatment is applied.

We have confidence in the uterine disorder is maintained for a long period it could irrevocably impairment the endometrium,perhaps altering the capacity of the uterus for hormones secretion and after subfertility in affected goats(2).

In conclusion, it can be concluded that real-time ultrasound approach is a reliable, rapid and useful tool for diagnosis and follow-up of goats affected with hydrometra. Successful treatment of goat with hydrometra and subsequent fertility was achieved using two doses of Cloprostenol one week apart.

References:

1. Hesselink JW. Incidence of hydrometra in dairy goats. Vet Rec. 1993;132(5):110–2.
2. Souza JMG, Maia ALRS, Brandão FZ, Vilela CG, Oba E, Bruschi JH, et al. Hormonal treatment of dairy goats affected by hydrometra associated or not with ovarian follicular cyst. Small Rumin Res. 2013;111(1–3):104–9.
3. Cherian N, Azeez CPA, Promod K, Benjamin ED, Murugan SS. Early diagnosis of pseudopregnancy in goats by ultrasonography and response to treatment using cloprostenol sodium. J Vet Anim Sci. 2023;54(1):160–6.
4. Yotov S, Dimitrov D, Fasulkov I. Hydrometra in a sheep after oestrus synchronization and insemination in the anoestral season. Slov Vet Res. 2009;46(4):143–7.
5. Edgar Villanueva R, Irma Celi M, Alfredo Delgado C. Pseudopregnancy in dairy goats - A case study. Rev Investig Vet del Peru. 2012;23(2).
6. Taverne MAM, Bevers MM, Hesselink JW, van den Brande HJ, Dieleman SJ, van Oord HA. Evidence for a dominant role of prolactin in the luteotrophic complex of pseudopregnant goats. Anim Reprod Sci. 1994;36(3–4):253–60.
7. Desire S, Mucha S, Coffey M, Mrode R, Broadbent J, Conington J. Pseudopregnancy and aseasonal breeding in dairy goats: Genetic basis of fertility and impact on lifetime productivity. Animal. 2018;12(9):1799–806.
8. Wittek T, Erices J, Elze K. Histology of the endometrium, clinical-chemical parameters of the uterine fluid and blood plasma concentrations of progesterone, estradiol-17β and prolactin during hydrometra in goats. Small Rumin

Res. 1998;30(2):105–12.
9. Junior ESL, Cruz JF, Teixeira DIA, Verde JBL, Paula NRO, Rondina D, et al. Pseudopregnancy in Saanen goats (Capra hircus) raised in Northeast Brazil. Vet Res Commun. 2004;28(2):119–25.
10. Hesselink JW, Elving L. Pedigree analysis in a herd of dairy goats with respect to the incidence of hydrometra. Vet Q. 1996;18(1):24–5.
11. Fonseca JF. Otimização da Eficiência Reprodutiva em Caprinos e Ovinos. ENCONTRO Nac PRODUÇÃO CAPRINOS E OVINOS, 1, 2006, AnaisSEDAP; SEBRAE; Insa ARCO, 2006 10 f. 2006;(1):10.
12. Luis J, Martel M. Incidencia de la hidrómetra en la agrupación caprina canaria [Hydrometra incidence of the caprine Canary Island group]. Vector Plus 6. 2001;(Foto 1):28–34.
13. Khan MI ur R, Channa AA, Sattar A. Diagnosis of pseudopregnancy in a beetal goat using real-time b-mode ultrasonography. Pak Vet J. 2015;35(4):537–9.
14. Haibel GK. Use of ultrasonography in reproductive management of sheep and goat herds. Vol. 6, The Veterinary clinics of North America. Food animal practice. 1990. p. 597–613.
15. SAS. Statistical Analysis System,Users Guide.Statistical.Version9.1th ed.SAS.Inst.Inc.Cary.N.C.USA. SAS Publishing; 2012.
16. Taverne M, Hesselink J, Bevers M, van Oord H, Kornalijnslijper J. Aetiology and Endocrinology of Pseudopregnancy in the Goat. Reprod Domest Anim. 1995;30(4):228–30.
17. Almubarak AM, Abass NAE, Badawi ME, Ibrahim MT, Elfadil AA, Abdelghafar RM. Pseudopregnancy in goats: Sonographic prevalence and associated risk factors in Khartoum State, Sudan. Vet World. 2018;11(4):525–9.
18. Maia ALRS, Silva MR, Brandão FZ, Souza-Fabjan JMG, Faria LS, Côrtes LR, et al. Epidemiological survey and risk factors associated with hydrometra in dairy goat herds. Small Rumin Res. 2019;178.
19. G. P. Dyulger, A. A. Stekolnikov, K. O. Shatsky, L. B. Leontev, P. G. Dyulger, E. S. Sedletskaya, et al. PATHOPHYSIOLOGICAL ASPECTS OF GOAT FALSE PREGNANCY (HYDROMETRA) AND MODERN METHODS OF ITS DIAGNOSIS AND THERAPY. Bull. 2020;1(383).
20. Barna T, Apić J, Bugarski D, Maksimović N, Mašić A, Novaković Z, et al. INCIDENCE OF HYDROMETRA IN GOATS AND THERAPEUTIC EFFECTS. Arch Vet Med. 2019;10(1):13–24.
21. Hesselink JW, Taverne MA. Ultrasonography of the uterus of the goat. Vol. 16, The Veterinary quarterly. 1994. p. 41–5.
22. Moraes E, Santos M, Arruda I,

Bezerra F, Aguiar Filho C, Neves J, et al. Hydrometra and mucometra in goats diagnosed by ultrasound and treated with PGF2α. Med Veterinária. 2007;1(June 2014):33–9.

23. Purohit GN, Sciences A. Hydrometra in goats (Capra hircus): Clinical analysis of 26 cases . Scanned by CamScanner. 2012;1(2):117–9.

24. Batista M, Medina J, Calero P, . 2019;9(1): 13-18.

González F, Quesada E, Gracia A. Incidence and treatment of hydrometra in canary island goats. Vet Rec. 2001;149(11):329–30.

26. Bisla A, Kumar B, Yadav D, Kurhe RS, Khan JA, Ngou AA, Rautela R ,Kumar H. Ultrasonographic Diagnosis and Clinical Management of Pseudopregnancy in Goats. Theriogenology