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Prevalence, Diagnoses and Treatment of Hydrometra in Diary Goats at Alkadaru District , Khartoum North Locality ,Sudan.

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Abstract

This research aimed to study the prevalence and treatment of hydrometra in different breeds of goats (does) (exotic, Saanen crosses and Nubian) presented to the Teaching Veterinary Hospital (TVH),College of Veterinary Medicine, University of Bahri, Alkadaru district. A total of 1150 goats age ranged between 2-4 years were introduced to the TVH during the period 2017 for routine pregnancy diagnosis by ultrasound trans abdominally using Ultrasonic Diagnostic Imaging System, Anti-Electro-Shock Type BPL Medical Technologies. Forty Five(one Damascus and 44 Saanen crosses) of them (3.91%) showed a non- echoic fluid within uterus and hyper-ehoic trabeculei and diagnosed as positive for hydrometra (HY) or pseudopregnancy .These animals were distributed seasonally in winter 30 (66.67%) and represented high prevalence of hydrometra (HY) ,followed by autumn 11 (24.44%) and summer 4 goats(8.89%). There was no significant association between animals and the condition ((P<0.19) . Out of the 45 cases only 12 (26.67%) goats were able to be followed up and treated they were of Saanen Crosses and 33(73.33%) ones were sold by their owners . Treatment was performed by intramuscular (IM) injection of two doses of 1ml of Prostaglandin ($PGF_{2\alpha}$) at 12 days . Five ml of Vit.AD_3E was injected IM once as a supportive treatment. Then after the evacuation of the uterus and appearance of estrus the does were mated naturally . A trans abdominal examination for pregnancy was performed by ultrasound after 45-60 days .Nine (75%) goats of the 12 ones responded (RS) to the treatment and conceived . It was concluded that HY is one of the fertility problems in goats in Alkadar district mainly the Saanen Crosses and is treated by Prostaglandin($PGF_{2\alpha}$) and Vit. AD_3E. Winter season compared to other seasons showed the high prevalence of HY.

Keywords: Goats, Hydrometra, Pseudopregnancy, Season, Treatment.

Introduction

In Sudan, goats constitute a large part of the livestock population and they are estimated at 31 million (MOAR,2012, FAOSTAT,2014). Goats in Sudan constitute an important source of livelihood, social security and rural economy. The different indigenous goat

populations are distributed across all agro-ecological zones of Sudan from the arid region in the North to the fertile Savannah in the South and they are classified into Nubian, Desert, Nilotic and Taggar goats (Rahmatalla *et al*.,2017).

Goats suffer from different reproductive disorders that limit their reproductive performance, one of these disorders is hydrometra (HY) or pseudopregnancy (Ahmed *et al*.,2010,Souza *et al*., 2013,Singh *et al*.,2018) . Hydrometra in goats drew attention when observed and reported in both temperate and tropical areas (Ahmed *et al.* ,2010 , Khan *et al*.,2015, Farliana and Yimer,2016, Almubarak *et al.*,2016 , Shanmuganathan *et al*.,2020). It is characterized by an enlarged uterus due to the accumulation of an a septic hypoechogenic fluid(Lêga and Toniollo, 1999, Moraes, 2014), persistence of corpus luteum , presence of mobile echogenic and relatively thin trabeculei, and absence of fetal parts and placentomes (Hafez ,2000, Martel, 2001,Almubarak *et al*.,2016). High levels of progesterone hormone , failure of fertization, cessation of cyclic activity and variable degrees of abdominal distension are also associated with HY (Noakes *et al*., 2009,Farliana and Yimer,2016) with no clinical changes in the general health condition ;however, goats behave as if they were pregnant due to the presence of a pseudopregnant corpus luteum (Martel, 2001). Genetically, the obstruction of the cervix or vagina, hyperestrogenism and hymen persistence have been suggested to be responsible for HY (Nascimento and Santos, 2003) and the incidence was higher in older goats than yearlings(Singh *et al*.,2018) . There is unknown etiology and pathophysiology for HY /Pseudopregnancy (Purohit and Mehta, 2012), however, Desire *et al*.(2017)suggested a genetic component in goats. In Dutch goats , Brom *et al*.(2019) reported a significant association between the incidence of pseudopregnancy and a higher percentage of goats with extended lactation .

The diagnosis of HY is performed by ultrasound, B-mode ultrasound which is used to monitor reproductive conditions in small ruminants. It is considered as a simple, non-invasive, rapid, and reliable method for detecting pregnancy, estimating litter size and fetal weight, and determining gestational age (Godfrey *et al*., 2010, Maia *et al*.,2018, Almubarak *et al*.,2016 ,2018). It is also useful in the diagnosis of pseudopregnancy, pyometra, ovarian cysts, and metritis (Gonzalez-Bulnes *et al*.,2010, Khan *et al*.,2015 and Almubarak *et al*.,2016, 2018).

Researchers reported varying values for the incidence of HY ranged from 1.37-20% (Bisla *et al*.,2019) , 3-20% (Singh *et al*.,2018) to 30.4% in Northeast Brazil (Lopez *et al*.,2004) . In the Netherland, Hesselink and Elving (1996) reported a prevalence of 10.4% during four estrus seasons in white Dutch dairy goats . Purohit and Mehita(2012) reported 6.12% and Moraes *et al.* (2007) reported an incidence of 7.7% of HY in different breeds of goats. In Southeastern Brazil dairy goats the incidence of 10.0% HY was reported (Maia *et al*.,2018). Wittek *et al*.(1997) reported an incidence of 5.78%. In Khartoum State , Almubarak *et al*.,(2018) reported 10.6% of HY in goats of Khartoum State.

Many protocols have been used to treat cases of hydrometra (Pieterse and Taverne, 1986; Souza *et al*. 2013). The treatment included injection of one dose of PGF2α followed by uterine evacuation (Wittek *et al*.,1997,Purohit and Mehta,2012,).However, Barna *et al* .(2017) reported pregnancy rate of 64% in goats with history of hydrometra injected with cloprostenol (PGF2α) at dose of 250 microgram, given twice at 11- 12 days interval and supporting therapy consisting of three doses of enrofloxacin 10% and one dose of vitamin AD_3E. Maia *et al*., (2018) had treated hydrometra with three

doses of prostaglandin given in ten day apart (day0, 10, and 20) that resulting in best emptying of the uterus from the fluid and pregnancy rate of 45% and 55%. Injection of one dose of PGF2α followed by a second one with one week interval resulted in pregnancies rates of 66.7% and 50% respectively in local breed of goats (Rasheed,2021).

Oxytocin hormone was injected in association with PGF2α to evacuate the uterus from the remained fluids after treatment(Pieterese and Taverne,1986, Batista *et al*.,2006).In case of HY associated with follicular cyst, Gonadotrophic releasing hormone(GnRH) (Maia *et al*., 2018) or human chorionic gonadotrophin (hCG) (Souza *et al*., 2013) are injected. Supportive treatment by vitamins are required in reproduction, because of their cellular roles in reproductive tissue, metabolism, maintenance and growth (Hurley and Doane,1989). Vitamin A is necessary in avoiding vaginal epithelium keratinization (Ganguly *et al*.,1980). Vitamin D influences time of first postpartum estrus and calving intervals(Ward *et al*.,1971). Vitamin E reduces the incidence of retained placenta and is partially involved in prostaglandins synthesis (Diplock, 1981).

Goats in the tropics are able to breed throughout the year(Hafez ,2000) and HY did not show any significant seasonal variation (Almubarak *et al.*,2018).While in the temperate zone they are seasonal breeder and HY was reported in and out of the breeding season (Hesselink and Taverne,1994 and Taverne *et al*.1995).

In Sudan , hydrometra was diagnosed by Ahmed *et al.* ,(2010) followed by Almubarak *et al*.(2016) and the incidence of positive cases was 10.6% in Khartoum State(Almubarak *et al.* (2018). The present study was conducted in Khartoum North locality of Sudan to determine the prevalence of HY and treatment by $PGF_{2\alpha}$ and Vit.AD_3E.

Materials and Methods

Area of Study: The Teaching Veterinary Hospital (TVH) ,College of Veterinary Medicine, University of Bahri, Khartoum North. It is situated in Alkadaru district at North Bahri locality, latitude and longitude are 15° 38´N 32° 38´ E.

Animals:
A total of 1150 goats presented to the TVH were examined for hydrometra and 45 positive cases were reported out of which 12 were followed and treated.

Instruments:
A B-mode ultrasound is used to monitor reproductive status in small ruminants (Buckrell,1988). A trans abdominal ultrasonographic examination with switchable frequencies (4.00 MHz) the apparatus Ultrasonic Diagnostic Imaging System, Anti-Electro-Shock Type (BPL) Medical Technologies.

Drugs:
Synthetic analogue$PGF_{2\alpha}$ (Cloprostinol Sodium BP 263 mircrogram (vet) equivalent 260 microgram/Intervet EU). Vit.AD_3E (Super´s Dians,S.L.Barcelona, Spain).

Methodology:
Hydrometra was examined by conducting ultrasound scanning (Hesselink and Taverne,1994, Almubarak *et al*.,2016,2018).The skin ventrally in front of the udder was shaved and special ultrasonic gel was applied as described by Almubarak *et al*.(2018). For the treatment of HY two doses of 1ml of Prostaglandin, ($PGF_{2\alpha}$)were injected intramuscularly (I/M) at 12 days gap to insure complete evacuation of the uterus. Five ml of Vit.AD_3E as a supportive treatment was injected I/M once. After cervical opening and uterine fluids discharge and on the appearance of estrus the does were mated naturally . Examination for pregnancy by ultrasound was done after 45-60 days from mating to check responded cases.

Statistical Analysis:
The generated data were analyzed using chi—square test. Data collected were treated and analyzed statistically using SPSS Package (BMSPSS,2020).

Results
The total number of goats examined (T.E.G.) by ultrasound for fertility problems were 1150 and 45 (3.91%) animals were positive for Hydrometera (Fig.1).One of the positive cases was an exotic breed, Damascus(2.22%),44 were Saanen crosses (97.78%) and the negative cases were Nubian goats. The owners got rid of their infected goats by selling them and only 12 (26.67%)goats of Saanen cross were left to be followed up .

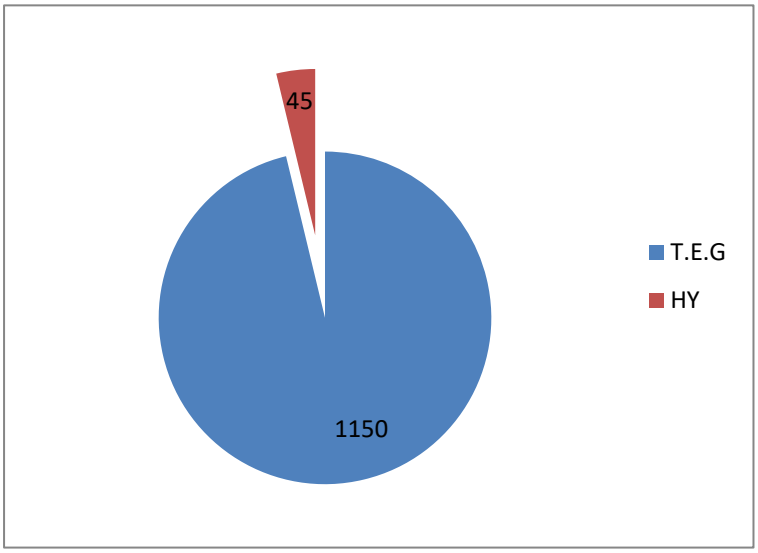

Fig.1. The number of goats with hydrometra(n=45) in Alkadaru district,Khartoum North locality.

As shown in figure 2a and 2b the accumulation of a non-echoic fluid within uterus and hyper-echoic
trabeculei indicate the presence of hydrometra in these goats .

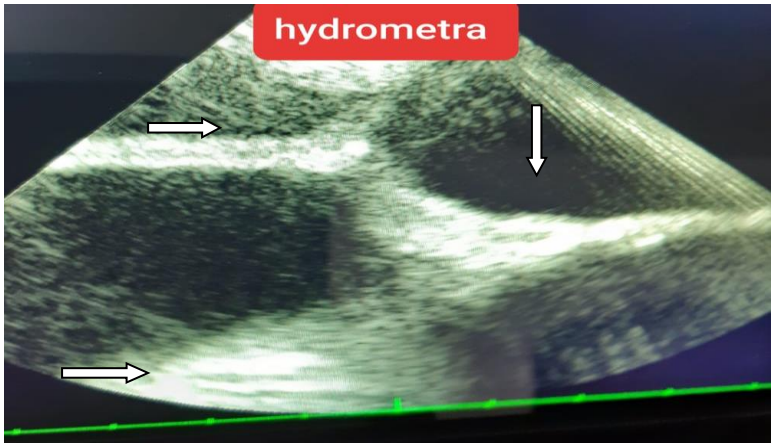

Fig.2.a

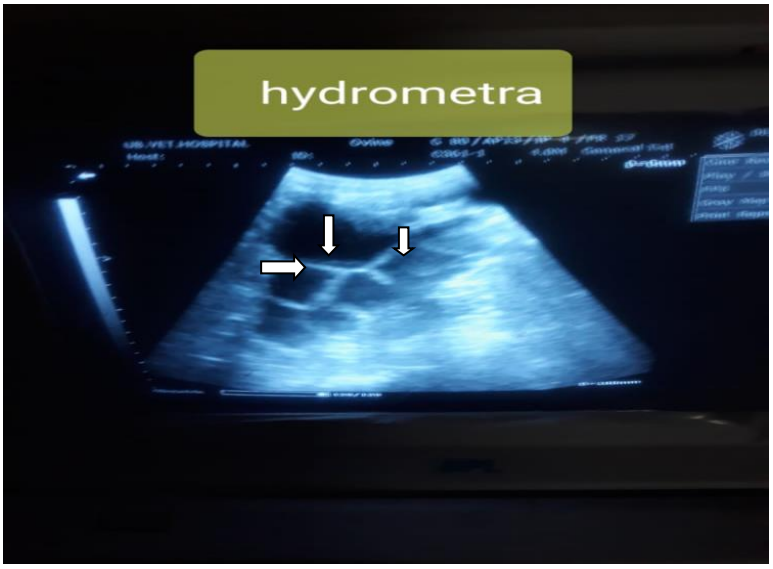

Fig.2.b.
Fig.2.a&b: Transabdominal Ultrasound Image of Uterus of Goats (n=45) Suspected of HY.

The 12 positive goats for HY showed signs of cloud burst within 48hrs from the second injection of PGF2α. Nine goats responded (RS) to the treatment and became pregnant when naturally mated and scanned by ultrasound with conception rate of 75%. The other three cases did not respond (NRS) representing 25% of the treated goats (Fig.3.) .Figure 4. revealed the stages of development of fetus in uterus.

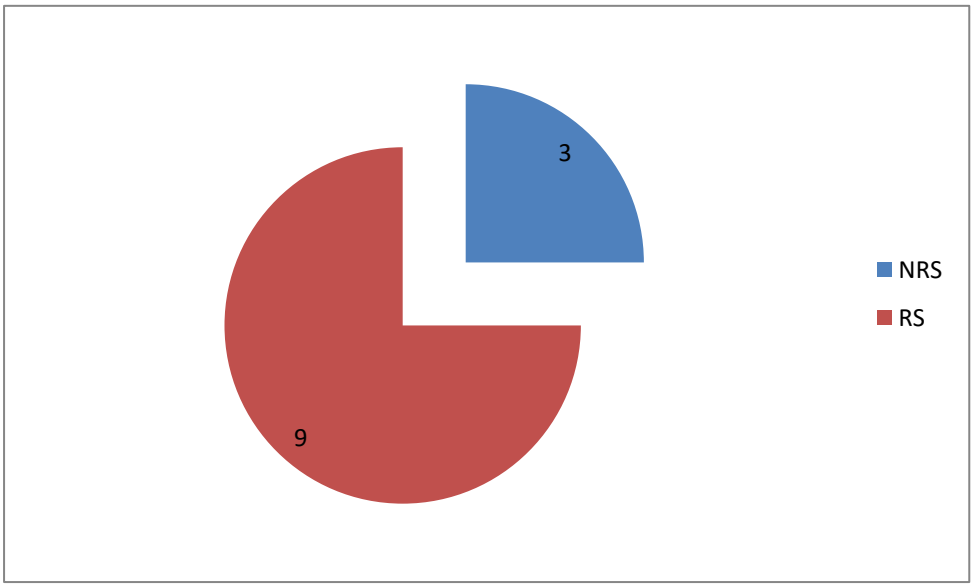

Fig.3. Responded (RS)and Non-responded (NRS) Cases of HY.

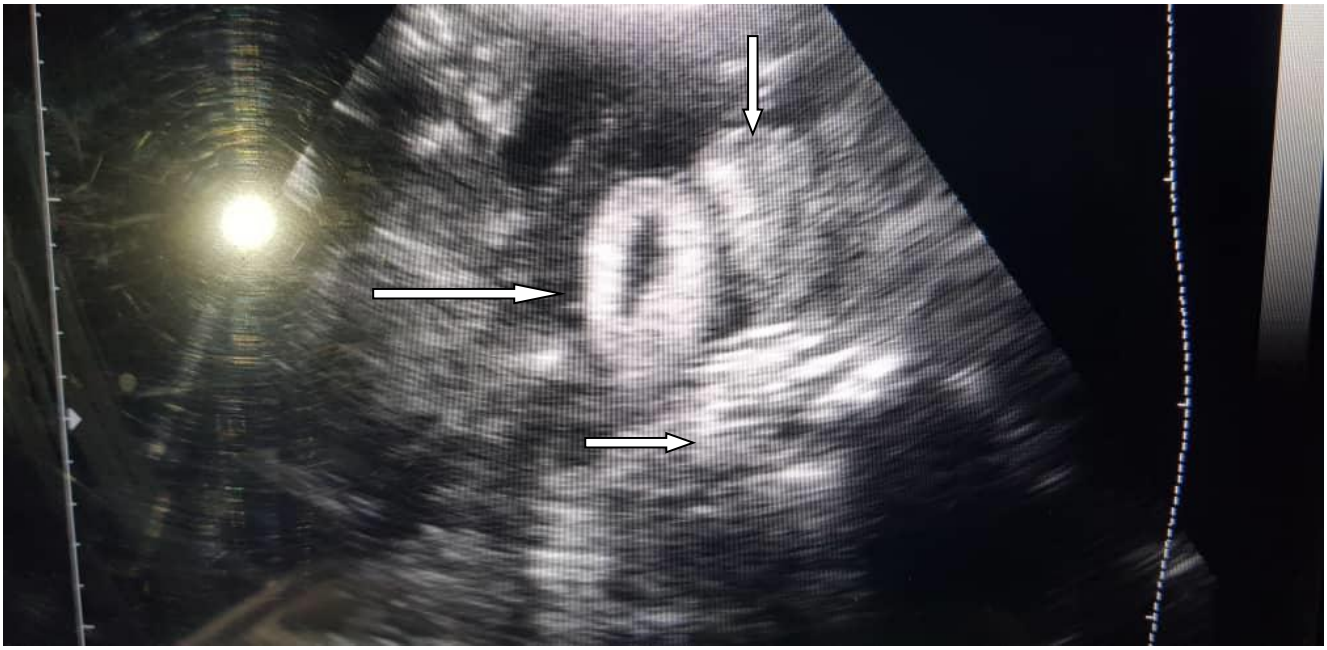

Fig.4 a. Placentomes of a pregnant doe (2.5month).

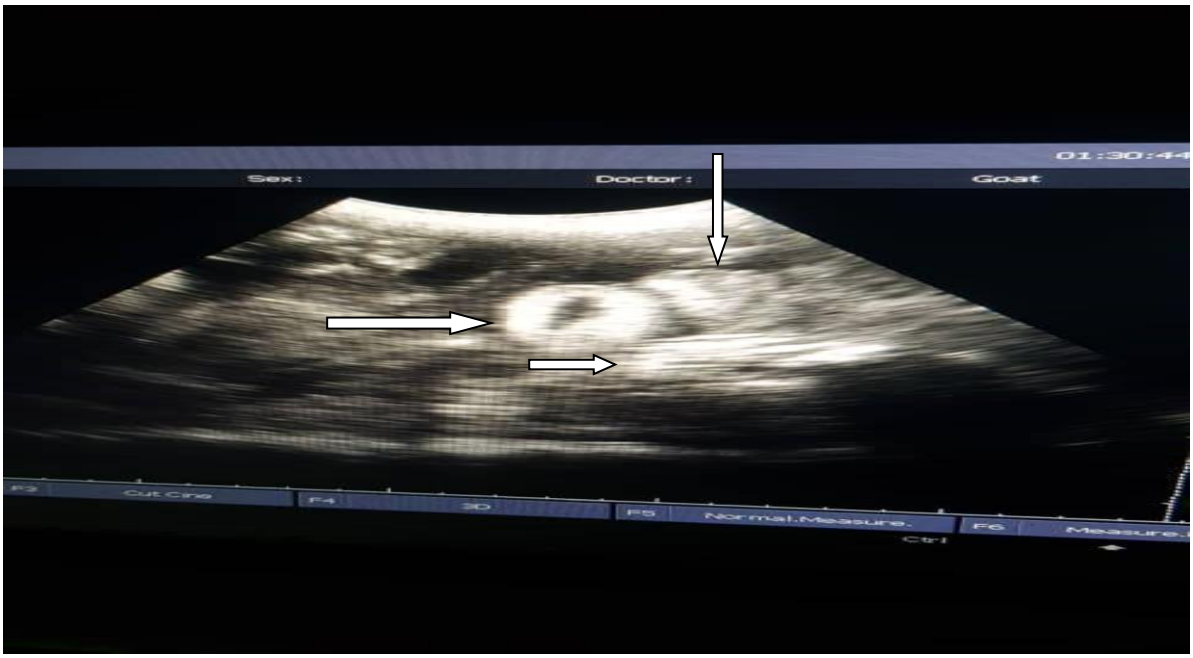

Fig.4.a. Placentomes of a pregnant goat (2.5 month).

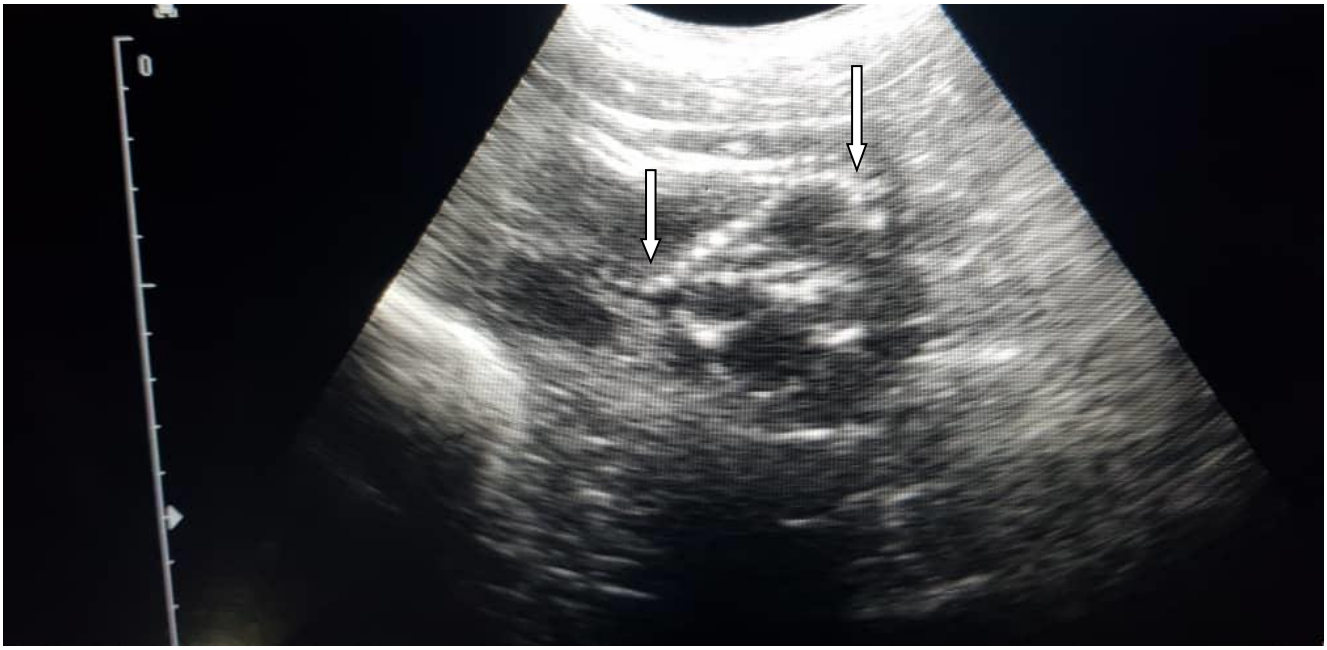

Fig.4.Fetal Vertebral Column (2.5 month).

Seasonally, out of the 45 reported positive cases of HY the distribution was as following , 30 goats in winter (66.67%) while during summer and autumn the cases were , 4(8.89%) and 11(24.44%) respectively(Fig.5).These numbers were not significantly different((P<0.19).

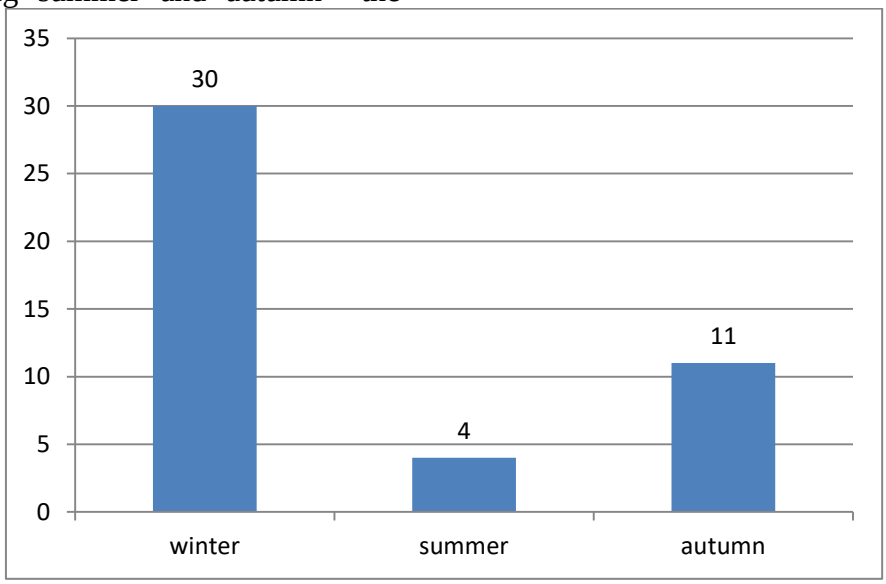

Fig.5. Seasonal Occurrence of HY. in goats (n=45) at Alkadaru district ,Khartoum North locality.

Discussion:

Hydrometra / pseudopregnancy is a pathological condition caused by disorders in luteolytic or luteotropic mechanisms and characterized by a persistent corpus luteum,accumulation of fluid in the uterus and high plasma progesterone concentrations (Shanmuganathan *et al*.,2020). Kornalijnslijper *et al*.(1997) reported that ,the active immunization of Saanen goats against Prostaglandin resulted in the extended life span of Corpus Luteum (CL) and development of HY , suggesting a role of mechanisms

blocking the release of the uterine luteolysin prostaglandin .

In the current study an echoic fluid with hyper-echoic uterine trabeculei with no fetal parts were observed in goats uteri examined by ultrasound which was diagnosed as Hydrometra (HY). This finding agreed with what was reported by other researchers (Pieterse and Taveme,1986, Khan,2004, Ahmed *et al*.,2010 Khan *et al.*,2015 and Almubarak *et al*. ,2016,2018).

In this study HY represented 3.91% out of the sonographically examined goats suffering from infertility. This percentage is nearly similar to what was reported (3.26%) by Batista *et al*. (2001) in Canary Islands goats .Contrarily a higher incidence of HY(10.6%) was reported in Khartoum State, Sudan by Almubarak *et al*.(2018). Generally, compared to other studies, the values obtained in this study was lower than what was reported in Southeastern Brazil dairy goats (9.20 %) (Maia *et al.*,2019) and local breed of goats (8.6%) (Rasheed ,2021) .The differences in obtained data in HY among these studies could be due to differences in genetic components, breed ,environmental and managemental conditions and number of animals examined .

The higher incidence of HY reported in Saanen crosses in this study (97.78%) could be related to breed affinity. However, this higher number of cases could be associated with the over use of synchronizing hormones by goats´ owners in the area of the study. This agreed with what was reported by Barna *et al*.(2017) where Saanen goats demonstrated statistically higher incidence(3.25%) of HY compared to other Alpine goats (0.56%).The authors attributed this to seasonal synchronization of anestric goats and occasionally out-of-season synchronization of nulliparous Saanen goats. In Brazil, a higher prevalence (30.4%) was found in Saanen goats by Lopes *et al*. (2004). Moreover, a higher percentage (12.4%) was reported in Toggenburg and Saanen breeds by Souza *et al*. (2013) in Brazil. Maia *et al*.,(2019) found that HY is significantly associated with Saanen breed and hormonal induced estrus. This finding disagrees with what was reported (9%) in Saanen goats of Netherlands (Hesselink,1993).

Age of examined goats in this study ranged from 2-4 years but it did not show any significant level ($P<0.17$). This finding disagreed with what was reported by other authors that HY is of higher incidence in older goats (Wittek *et al*.,1997,Singh *et al*.,2018 and Maia *et al*.2019).

In the current experiment evacuation of the uterus was performed by injection of two doses of PGF2α at 12 days apart . Similar results were obtained when double doses of PGF2α were administered by Moraes *et al.* (2007) and Barna *et al*.(2017) at 11 days intervals and Rasheed(2021) at a week interval then return to estrus . However , some cases were treated by injection of one dose of PGF2α even in one reported case (Khan *et al*.,2015,Farliana and Yimer,2016, Almubarak *et al*,2016 ,and Shanmuganathan *et al*.,2020) or more than one case (Purohit and Mehta, 2012) . Maia *et al*. (2018) had treated hydrometra with three doses of prostaglandin given in ten day apart ,day 0, 10, and 20 .

In this study the pregnancy rate reported in treated goats was 75% compared to other findings. This high value reported could be related to the small number of animals treated and vitamins supplementation. The current findings did not agree with Barna *et al*. (2017) who reported a pregnancy rate of 64% with double injection of PGF2α at 11 days interval . Rasheed (2021) reported a pregnancy rate of 66.7% treated by one dose PGF2α and 50% in goats treated by a second dose with one week a part. Also, Hesselink(1993) reported a pregnancy

rate of 48% after doubling the dose of PGF2α .Maia *et al*.,(2018) reported 45-55% of pregnancy rate by three injections of PGF2α .

In the current experiment, cases of HY reported during winter season 30(66.67) were higher compared to autumn,11(24.44%) and summer 4 (8.89%) seasons, but they did not attain a significant level (P<0.19) . As in the tropical countries , goats in Sudan are not seasonal breeder they tend to breed throughout the year (Hafez ,2000) **;** however most births took place during winter ,after being synchronized to have good pasture conditions in autumn . This high incidence could be related to the fact that goats that did not give birth during winter show pseudopregnancy on ultrasound examination. Almubarak *et al*.,(2018) reported 13(9.2%) ,19(14%) and 8(8%) cases in winter, autumn and summer season respectively in Saanen goats in Sudan with no significant level reported which was in line with Hesselink and Taverne(1994) and Taverne *et al*.(1995) who indicated that there is no relationship between HY prevalence and seasonal changes .

It can be concluded that dairy goats, mainly Saneen Cross, in North-Khartoum locality , suffer from hydrometra and this causes a great economical loss , which affects the stratification of the flock in addition to the great loss in milk production .Using ultrasonography for diagnosis of hydrometra is a reliable technique. Treatment of Hydrometra by prostaglandins and multivitamins was useful and achieved a remarkable result. The hormonal treatment for estrous synchronization should be controlled and done under supervision of veterinarians. Crossing between breeds should concentrate on Nubian goats to minimize the incidence of HY.

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References

Ahmed ,B.H.; Hamad, R.J .and Abdelghafar, RM.(2010). Ultrasonography for diagnosis of hydrometra and pyometra (two case reports). *Assiut Vet.Med. J*., 56:225-230.

Almubarak A.M. ; Abdelghafar ,R.M. ; Badawi ,M.E.(2016). Hydrometra in a goat-diagnosis, treatment and subsequent fertility. *Int. J. Livestock Res.* 2016;6:114–118.

Almubarak,A.M. ; Abass,N.,A. ; Badawi,M.E. ; Ibrahim,M.T ; Elfadil,A.A. and Abdelghafar,R.M.(2018).Pseudopregnancy in goats: Sonographic prevalence and associated risk factors in Khartoum State, Sudan(2018)., *Vet. World*. 11(4): 525–529.

Barna,T ; Apić ,J. ; Bugarski1 ,D. ; Maksimović ,N. ; Mašić ,A. ; Novaković , Z. ; Aleksandar,M. (2017).Incidence of Hydrometra in Goats and therapeutic . Arhiv Veterinarske Medicine, Vol. 10, No.(1),pp: 13 – 24.

Batista, M.; Medina, J. ; Calero, P. ; Gonzalez, F. ; Quesada, E. and Grasia, A. (2001). Incidence and treatment of hydrometra in Canary Island goats. *Veterinary Record*, 149, 329-330.

Batista, M. ; Alamo, D; Caballero, M. J. ; González, F. ; Cabrera, F. ; Rodríguez, N. ; Espinosa, A. ; Gracia, A. (2006). Segmental aplasia of theuterus associated with hydrometra

in a goat. Veterinary Record, 159: 597-598.

Bisla1,A. ; Kumar,B. ;Yadav.D. ; Kurhe,R.S. ; Khan,J.A. ;Ngou,A.A. ;Rautela,R.and Kumar,H.(2019). Ultrasonographic Diagnosis and Clinical Management of Pseudopregnancy in Goats. Theriogenology Insight: 9(1): 13-18,

Brom , R.,V. ; Klerx ,R.V; ellema ,P. ; Peterson ,K.L. ; Hesselink , J.W. ;Moll ,L. ;Vos ,P. ;Berends,I.S.(2019).Incidence, possible risk factors and therapies for pseudopregnancy on Dutch dairy goat farms: a cross-sectional study. Vet Rec. 22;184(25):pp:770.

Buckrell, B.C.(1988). Applications of ultrasonography in reproduction in sheep and goats. *Theriogenology* 29, 71– 84.

Desire, S. ; Mucha,S. ; Coffey,M. ;Mrode,R. ;Broadbent,J .and Conington,J.(2017).Pseudopregnancy and aseasonal breeding in dairy goats: genetic basis of fertility and impact on lifetime productivity.Animal,pp:1-8.

Diplock, A. T. (1981). The role of vitamin E and selenium in the prevention of oxygen-induced tissue damage. Page 303 *in :Selenium in biology and medicine.* J. E. Spallholz, J. L. Martin, and H. E. Ganther, ed. AVI Publ. Co., Inc., Westport,CT.

FAOSTAT: Food and Agriculture Organization of the UniteNations: http://www.fao.org/faostat/en/ (2014).

Farliana, N.M. D. and Yimer,N.(2016). Pseudopregnancy in a Doe and its Hormonal Therapy *International Journal of Livestock Research*.6 (6),pp: 90-95.,

Ganguly, J. ; Rao,M.R.S; Murtby,S.K. and Sarad,K.. (1980). Systemic mode of action of vitamin A. Vitam. Horm. 38:1.

Godfrey ,R.W;. Larson ,L. ;Weis , A.J. ; Willard, S.T. (2010).Evaluation of ultrasonography to measure fetal size and heart rate as predictors of fetal age in hair sheep. *Sheep Goat Res. J.* ;25:pp:60–65.

Gonzalez-Bulnes, A. ;Pallares, P. ; Vazquez, M.(2010). Ultrasonographic imaging in small ruminant reproduction. *Reprod. Domest. Anim.* ;45:pp:9–20.

Hafez,B .(2000). *Reproduction in Farm Animals*, 7th ed. Lippincott William &Wilkins, USA.

Hesselink J.W. (1993).Incidence of hydrometra in dairy goats. *Vet. Rec.* 1993;132:pp:110–112.

Hesselink, J.W. and Taverne, M. A. (1994). Ultrasonography of the uterus of the goat. Veterinary Quarterly.16: (1),pp: 41-45.

Hesselink J.W and Elving, L.(1996). Pedigree analysis in a herd of dairy goats with respect to the incidence of hydrometra. *Vet. Q.* ;18:24–25.

Hurley,W.L. and Doane,R.(1989). Recent Developents in The Roles of Vitamins and Minerals in Reproduction.J.Dairy,Sci.,Vol.2,No(3),pp:84—804.

IBM SPSS Statistics For Windows (2020). Version 20.0 Armonk,NY:IBM Corp.

Khan W. (2004). Veterinary Reproductive Ultrasonography. Schlutersche Verlagsgesellschaft, mbH and CO. KG, Hans-Bockler-Allee 7, 30173 Hannover, Germany.

Khan, M.,I.R. ; Channa,A.A. and Sattar,A.(2015). Diagnosis of Pseudopregnancy in a Beetal Goat Using Real-Time B-Mode Ultrasonography. Pak .Vet. J., 35(4):pp: 537-539.

Kornalijnslijper ,J.E. ; Bevers, M.M. ; Van Oord, H.A. ; Taverne ,M.A.(1997).Induction of hydrometra in goats by means of active immunization against prostaglandin

F2 alpha. Anim Reprod Sci. 46(1-2):109-22.

Lèga, E. and Toniollo,, G. H. (1999).Hydrometra in goats – Report of a case in *Capra hircus*.Brazilian Journal of Animal Reproduction, 23, pp: 446-447.

Lopes ,J. E.S., Cruz, J.F., Teixeira, D. I., Lima, V. J.B., Paula, N.R., Rodnina, D. and Freitas, V.J. (2004). Pseudopregnancy in Saanen goats (Capra hircus) raised in Northeast Brazil. Veterinary Res. Commun. 28:pp:119-125.

Maia,L.R.S. ;Brandão,F.Z;. Souza-Fabjan,J.M.G. ; Veiga,M.O. ;Balaro,M.F.A. ; Facó.O. and Fonseca,J.F. (2018). Transrectal ultrasound evaluation in tropical dairy goats: an indispensable tool for the diagnosis of reproductive disorders. Tropical Animal Health and Production volume 50, pp:787–792.

Maia, A. L. R. S. ; Silva, M. R. ; Brandão, F. Z. ;Souza-Fabjan, J. M. G. ; Faria, L. S. ; Côrtes, L. R. ; Facó, O. ; Fonseca, J. F.(2019).Epidemiological survey and risk factors associated with hydrometra in dairy goat herds. Small Ruminant Research 2019 Vol.178, pp:79-84.

Martel, J. L. M. (2001).Incidência de la hidrómetra em la agrupacion caprina canária. Vetor Plus, Vol. 18, pp:28-34.

MOAR(2012). Ministry of Animal Resources-Information Center. Khartoum, Sudan: Estimate of Livestock Population by States.

Moraes, E.P.B.X; Santos, M.H.B ; Arruda,I.J. ;Bezerra,F.Q.G. ; Aguiar Filho,C.R. ;Neves, J.P. ; Lima,P.F. ; Oliveira,M.L.A. (2007).Hydrometra and mucometra in goats diagnosed by ultrasound and treated with PGF2α. Medicina Veterinária, Recife, Vol..1, No.(1), pp.33-39.

Moraes ,E.P.B.X., (2014).Hydrometra and mucometra in goats diagnosed by ultrasound and treated with PGF2α. Med Vet Rev Cient DMV, 1:33-39.

Nascimento, E. F. ; Santos, R. L. ; Alterações ,R.(2003). In: NASCIMENTO, E. F.; SANTOS, Regressivas. L. Patologia da Reprodução dos Animais Domésticos. Rio de Janeiro: Guanabara Koogan, . Cap. 3, p. 52.

Noakes ,D.E. ;Parkinson ,T.J. and England, G.C. (2009). Veterinary Reproduction and Obstetrics, 9th edition, WB Saunders, Elsevier.

Pieterese ,M.C. and Taverne, M.A. (1986). Hydrometra in goats: diagnosis with real-time ultrasound and treatment with prostaglandins or oxytocin. Theriogenology; 26:pp: 813-821.

Purohit,G.N. and Mehta,J.S.(2012). Hydrometra in Goats(Capar hircus):Clinical Analysis of 26 cases. Ruminant Science, Vol (1), No(2),pp:117-119.

Rahmatalla,S.A. ; Arends, D. ; Reissmann,M. ; Said Ahmed ,A. ;Wimmers,K. ; Reyer,H.and Brockmann,G.A. (2017).Whole genome population genetics analysis of Sudanese goats identifies regions harboring genes associated with major traits. *BMC Genetics* volume 18, Article number: 92 :pp:2-10.

Rasheed ,Y.M.(2021). Ultrasonic diagnosis of Hydrometra and subsequent fertility after treatment with Prostaglandin F2α in Goats. Diyala J.Vet.Sci.,1(1):pp:1-8.

Shanmuganathan, S; Kathiravan, R..S and Madhesh ,E.(2020). Management of Pseudopregnancyin goat in field condition –A case report, Journal of

Entomology and Zoology Studies 2020; 8(4):pp: 1251-1252.

Singh,L.K. ; Parta,M.K. ;Mishra,G.K. ; Yengkhom,R. ; and Aamrapali bhime,A.(2018).Pseudopregnancy In Dairy Goats.Indian Farmer,5,(8):924-927.

Souza, J.M. ; Maia ,A.L; Brandao, F.Z. ; Vilela, C.G. ;Oba ,E. ; Bruschi, J.H. ; Fonseca. J.F. (2013).Hormonal treatment of dairy goats affected by hydrometra associated or not with ovarian follicular cyst. *Small Rumin. Res.* 111:pp:104–109.

Taverne, M.A. ; Hesselink ,J.W. ;Bevers, M.M. ;Van Oord, H.A. and Kornalijnslijper ,J.E. (1995). Etiology and Endocrinology of Pseudopregnancy in the Goat. Reproduction in Domestic Animals 30: 228-230.

Ward, G. ; Marion,G.B ;Campbell,C.W. and Dunham,J.R. (1971): Influences of calcium intake and vitamin D supplementation on reproductive performance of dairy cows. J. Dairy Sci. 54 : 204.

Wittek ,T. ;Richter, A. ;Erices,J. ; Elze,K.(1997).Incidence, diagnosis, therapy and subsequent fertility in goats with hydrometra. Tierarztl Prax Ausg G Grosstiere Nutztiere

25(6):576-582

انتشار تشخيص وعلاج مولا الرحم في ماعز الالبان بحي الكدرو –محلية شمال الخرطوم السودان.

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المستخلص:

هدف هذا البحث الي دراسة انتشار وعلاج حالات موه الرحم في سلالات مختلفة من الماعز(اجنبية–هجين السعانين والنوبية) التي احضرت الي المستشفي البيطري التعليمي –كلية الطب البيطري –جامعة بحري– حي الكدرو بغرض الفحص الروتيني للحمل خلال العام 2017. تم فحص عدد 1150 من الماعز والتي تتراوح اعمارهم من 2–4 اعوام باستخدام تقنية الموجات فوق الصوتية عبر البطن . كشف الفحص عن وجود سالل داخل الرحم لعدد 45 (3.91%.) من الماعز (واحد دمشقي و44 من هجين السعانين) شخصت بموه الرحم او الحمل الكاذب . الانتشار الفصلي لهذه الحالات ان اكبر في في فصل الشتاء 30 حالة (66,67%) ثم فصل الخريف11 حالة (44،24%) وفصل الصيف 4 حالات (8،89%) ولكن لم تظهر هذه القيم اي ارتباط معنوي (P<0.19). تمت متابعة و علاج عدد 12(26.67%) حالة من حالات موه الرحم من هجين السعانين نسبة لبيع المربيين 33(73.33%) من الماعز المصابة وذلك بحقن جرعتين 1 مل من هرمون البروستاقلاندين بالعضل بفارق 12 يوم و5مل من فيتامين أ3د3 كعلاج مساعد ومراقبة فتح عنق الرحم وخروج السؤال من الرحم . بعد ظهور الشبق تم تلقيح الماعز طبيعيا وخلال 45–60 يوم تم فحص الحمل باستخدام تقنية الموجات فوق الصوتية عبر البطن ووجد حمل بعدد تسع حالات (75%) بينما لم تستجب ثلاث حالات (25%) للعلاج. خلصت هذه الدراسة الي ان موه الرحم يشكل احد مسببات تدني الخصوبة في الماعز خاصة هجين السعانين بمحلية شما ل بحري وامكن علاجه باستخدام هرمون البروستاقلاندين وفيتامين أ3د3 وان نسبة حدوثه في فصل الشتاء كانت أعلي مقارنة بالفصول الاخري .