A Study on the prevalence of abortion in cattle and its major causative agents in Salah Adin City

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Abstract

The Study have been done to know the most popular causative agents which cause abortion cattle in SalahAdin City during the period from 1/1/2013 to13/12/2013.

Blood samples collected from cattle and fetus aborted(n=200). diagnosis of the cases abortion have been done by using enzyme –Linked Immune sorbent assay ,culturing and biochemical test.

The results showed that bacterial diseases are the most prevalent one 42.5% then the viral diseases 25%,this is followed by parasitic diseases 15%.then fungi diseases 12.5% and finally Unidentified agent was 5%.

دراسه حوله انتشار الاجهاض في الابقار واهم مسبباتها المرضيه في محافظه صلاح الدين – تكريت

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الخلاصة

اجريت هذه الدراسة لمعرفه معظم المسببات المريضيه الشائعة المسببه لحالات الاجهاض في الابقار في محافظه صلاح الدين خلال الفترة من٢٠١٣/١/١ ولغاية ٢٠١٣/١٢/٣١ .جمعت ٢٠٠ عينه دم من الابقار والاجنه المجهضه وشخصت الحالات المجهضه. باستخدام كتأت الاليزا والأوساط الزراعيه والاختبارات الكيميوحيويه .

اخيرا غير المشخصه .12.5% والإمراض الفطريه 15%تتبعها الامراض الطفيليه25%

INTRODUCTION

Abortion is defined as fetal death and expulsion between 42 (an estimated time of attachment) and 260 days (the age at which a fetus is capable of surviving outside the uterus) of gestation. The condition does not include fetal maceration and mummification[1].

An interaction between the concepts and immune system are important during pregnancy[2].Maternal infections during pregnancy have been associated with a variety of gestational complications, including pregnancy loss (particularly in the second trimester, preterm birth, and poor neurological outcome in the fetus.[3], also[4] explained that the inflammatory processes induced by host defense to infection or by immune disorders independent of infection are a major challenge to successful pregnancy and are linked to fetal growth restriction .

The effects of infection on pregnancy and fetal development are mediated in large part by pro inflammatory cytokines[5],these cytokines have direct access to the placenta via maternal blood and signaling may be propagated across the placental barrier through stimulation of inflammation within the placenta [6]. TNF-α is known to have detrimental effects on the placenta via its cytotoxic effects, which are mediated largely through TNF receptor 1 (TNFR1) through its intracellular death domain, which activates the caspase apoptosis pathway ,also TNF alpha ,can act in gestational tissues, are target uterine endothelial cells and elicit vascular injury and placental ischemia and cause fetal injury leading to placental and fetal damage [7].

Either infectious or non-infectious agents may cause abortion. The infectious causes include bacterial, mycotic, viral, and protozoal. Historically, it has been suggested that 50-65%, 20-25%, and 15-25% of infectious abortions were caused by bacterial, fungal, and viral causes respectively. Based on diagnostic samples submitted to a laboratory in western United States, 45% are attributable to bacterial causes, 31% to mycotic causes, and 15% to viral causes, the non-infectious causes include nutritional factors, chemicals, drugs, toxins, poisonous plants, and hormonal agents. [8]

Bacterial abortions result from brucellosis, leptospirosis, campylobacteriosis (vibriosis), listeriosis, haemophilus somnus complex, and ureaplasmosis. Bacteria like Salmonella, Actinomyces, Escherichia coli, Streptococcus, Staphylococcus, Bacillus, Pseudomonas, Proteus, Pasteurella, nocardia, and chlamydia species, as determined by the microbiological findings, can cause abortion.[9].

Fungal or mycotic infection of the placenta is one of the most common causes of sporadic bovine abortion , Any where from 20-35% of abortions have been attributed to fungal causes, abortion occurs when fungal spores enter a pregnant cow’s blood stream (possibly through breaks in the lining of the upper digestive tract), settle at the junction

of the maternal and fetal placentas, grow and attack the placental tissues. In general, fungal spores may be present in cattle feed, However. some feeds such as improperly preserved silage and hay that has been wet, contain many more spores than others [10].

Infectious bovine rhinotracheitis (IBRV) or bovine herpesvirus 1 (BHV-1) is a major cause of viral abortion. Although the development of effective vaccines appears to have reduced the incidence of IBRV induced abortions, it still remains the most frequently diagnosed viral cause of abortion in North American cattle. Infected cows or any animal with a positive titer may be carrying the virus and abortions occur from 4 months to term, Bovine viral diarrhea causes abortion usually in the early part of gestation (up to 4 months) and is spread by infected cattle housed or pastured together[11].

Trichomoniasis Caused by Tritrichomonas fetus and is spread by venereal transmission. The organism is responsible for early embryonic death, infertility, and rarely abortion. Neosporosis: Neospora caninum is a recently recognized protozoan parasite of animals, which until 1988 was misidentified as Toxoplasma gondii .It is probably not a new disease, but rather a newly recognized one[12].

noninfectious causes of abortion include nutritional*:* Starvation may result in placental insufficiency and abortion ,however, it rarely occurs in a modern dairy practice. Vitamin A deficiency has been suggested to result in thickening and degeneration of placenta and abortion in late gestation. Iodine deficiency has also been suggested as a cause of abortion[13].

Chemicals, drugs, and toxins*:* High concentration of nitrates in plants/weeds can cause abortion from 3 to 9 months of gestation. Pine needles and locoweeds can cause abortion depending on the stage and the amount consumed ,ergot can cause placental necrosis, fetal death and abortion. Warfarin and coumarin can also cause abortion. Mycotoxins from the fungal agents are suspected to cause abortion. Bacterial endotoxin is responsible for sporadic abortions. Among the hormonal agents, estrogen, glucocorticoids, and prostaglandin are important. They cause abortion depending on the dose and the stage of gestation they are used. Stress may also cause abortion [14].

Materials and methods

-Animals and study design:-

This study was carried out during the period 1/1/2013 to 31/12/2013 at the the central research Laboratory in Tikirt city,(Iraq). Blood samples were collected from 200 aborted fetus cattle from various region of Tikirt city.

Aborted fetus form bacteria and fungi isolation and sera sample was stored at -20^{o}c for serological study(viral and parasitic detected).

Blood and aborted fetus collection:-

When an abortion occurs submit samples for laboratory diagnosis .place aborted fetus putting in plastic bags. wear disposable gloves prevent contamination by disease organisms.

Portion of aborted fetus was placed in a beaker and was washed by sterile normal saline to remove debris then by sterile scalpel, we cut aborted fetus into small pieces, then we cultured these specimen on the surface of the plate of Sabouraud dextrose agar containing choramphenicol 0.05gm/ml and incubated at 30^0c for 2-5 day, maCconkey agar, ssagar, nutrient agar and blood agar. the inoculated plates were incubated at 37^0c under aerobic for 24hr or microaerophilic atmosphere. The candle jar was applied for microaerophilic purpose. the plates were examined every 3-5 day.

Fungi and bacterial isolates were identified by colonies, microscopic characteristic, stained with gram stain and Lacto phenol cotton blue, rose Bengal plate test and biochemical tests showed by in table (1).

Table1.Biochemical identification of Campylobacter fetus subspecies fetus

Biochemical tests	25°C	42°C	Oxidase	Catalase	NaCl3.5%	H2S
C. fetus subsp. *fetus*	+	V	+	+	-	-

Commercial indirect Elisa kits(Svanova Bio AB Uppsala/Sweden)were used of Bovine Viral Diarrhea Virus Abs in samples according to manufacturers instruction. Were ELISA Kits for Toxoplasma and IBRV were used for detection Abs in samples according to manufactured by Instut parquier.

Results and Discussion

Result indicated that 190 out of 200 aborted cattle and sera(95%) were found to be positive and (5%) out of 200 samples were negative aborted in cattle Table (2).

Table 2. Infectious agents most commonly identified and associated with 200 bovine abortion

	Infectious agent identified	Abortion episodes	
		Number	%
1	*Bacillus Spp*	30	15
2	*Listeria monocytogenes*	20	10
3	*Escherichia coli*	13	6.5
4	*Salmonella* spp	8	4
5	*Brucella abortus*	5	2.5
6	*Arcanobacterium pyogenes*	4	2
7	*Campylobacter fetus*	5	2.5
8	*Bovine Viral Diarrhoea Virus*	30	15
9	*Infectious Bovine rhinotracheitis virus*	20	10
10	*Toxoplasmosis*	30	15
11	*Fungi(AspergillusSpp,MucourSpp,Absidiaand Rhizopus*	25	12.5
12	*Unidentified agent*	10	5

**

Chi-Sq = 77.935 P-Value = 0.00003

It is clear that bacterial disease are the commonest cause of abortion. these organisms usually get to the placenta and fetus by way of the cows circulatory system while these bacteria may not cause disease symptoms in the cow. the fetus appears to more susceptible .in large part because of its immature immune system. The results growth of bacteria can cause death of the fetus. which in turn results in it being expelled aborted from the uterus and it is also reported to cause infertility, chronic infection and multiple abortion in herds(16).

Studies conducted on prevalence the agents most commonly identified and associated with 5662 bovine abortion episodes investigated in the UK during 2003.(14). In westen united states 45% are attributable to bacterial causes,31% to mycotic causes and 15% to viral causes(17).

The present study showed that BVD and IBR virus are associated with abortion. the viruses are carried to the placenta in WBCs. over the next two week to 4 month ,it causes a placentitis, then infects the fetus and kills it in 24hr.abortion can occurs any time but usually is from 4 month to term. autolysis is consistently present, congenital malformation of CNS, congenital ocular defects and congenital gestation.(18).

These results consistent with Crawshaw etal., who found that of 739 abortion episodes 6% were associated with BVD infection. in Iraq he isolated from 84 claves 66(55.44%)(19)

The present study also reported that Toxoplasma was isolated from 30 cases of abortion (15%) these observation may indicated that a role of Toxoplasma in abortion ,stillbirth, placentitis which are typically occure in the late stage of pregnancy and destructive influence on productive yield.(20).

Studies conducted on seroprevalence of toxoplasmosis in different regions of Iraq were between 17.35% (21) and 81.3% (22). In Turkey, a close neighboring country, positive seroprevalence of goats living in Van region was 80.61 % and 6.12 % for toxoplasmosis and brucellosis, respectively (23). Astonishing frequency of toxoplasmosis is unduly variable in the different of the world. Our results were quite higher in comparison with results reported for average Iraq's results.the results study that the percentage was (12.5%).

These results with due to the environmental condition provided proper condition to fungal infections as due to cold climate and poor nutrional condition, this result was consistent with Knadtson and Kirkbride.(24) who recorded that the incidence of mycotic abortion is sporadic, in the northern hemisphere, occurring mainly during the winter periods, when cows are usually fed with a large amount of hay .also Ali and Khan.(25) explained that the poor aeration and high humidity promote the environmental fungal growth. The administration of wet stored and mouldy fooder, in which a large amount of fungal spores could be present, is a further risk factor for the mycotic abortion. The

fungal spores can penetrate through gastric lesions or the respiratory tract and reach the placenta and the fetus where there are optimal conditions for their full development [26].

these result was in consistent with William *etal.*,who diagnosed mycotic abortion in five cases (3.4%) of bovine abortion in southern Brazil and he isolated *Aspergillus fumigatus* from four cases and *A. niger* from one, also Donald, and Richard, reported that fungal placentitis in bovine due to Aspergillus sp form 60-80% of mycotic abortion.

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