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Original Article

Epidemiological Survey on Abortions in Domestic Ruminants in the Governorate of Biskra, Eastern Arid Region of Algeria

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Abstract

Abortions in ruminants can have several causes. A very few studies were realized in Algeria about abortions in domestic ruminants. The aim of this study was to collect necessary epidemiological data concerning observed characteristics of abortions in ruminants of the governorate of Biskra. Therefore, we elaborated a field investigation using a questionnaire, that touched 31 private veterinary practitioners. Statistical analysis was performed by SPSS software. Results showed that the most observed frequency of occurrence of abortions is « many per annum » (45.2 %). Autumn was mentioned as the highest risk period of abortions in ruminants. The most observed epidemiological form of abortions is (Enzootic in herds with epizootic pics) ; (41.93%).The pregnancy stage of high risk of occurence of abortions is (Tound trimester) ; (58.06 %). Chi-square test showed a high positive significant correlation (r = + 0,03) between the variable « region » and the variable « frequencies of occurrence per annum ». Abortive causes in ruminants are so various, and with no specific symptoms in the main time. Generally, epidemilogical data are not sufficient to a full diagnosis. Techniques with high specificity and sensibility as PCR and ELISA should be widespread.

Keywords: Survey**,** abortions, ruminants, infectious, zoonoses, Algeria, Biskra.

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Introduction

Abortions in ruminants can have serious economic consequences when existing in one livestock. Causes of abortions are various and can be interfered ; accidental traumas, loss of hormonal equilibrium and inadequate medication of animals, these factors seem to be the major causes of sporadic abortions, while infectious agents as bacteria, fungus, viruses and parasites can be, in general, agents of enzootic or epizootic abortions.

Abortions in domestic herds of ruminants in Algeria, constitute a hard dilemma, as several other parts of the world. On one hand, it is very difficult to delimit and characterize all infectious abortive agents existing in the whole area of the country, because of lack of technical and logistic means. On the other hand, even engendered economic losses are not subject of recuperation, so that abortions form a source of continuous frighness, especially in nomadic breeders population. In main times, sporadic abortions don't engender great losses, while infectious abortions are very desatvantageous on human healh, in addition to economic losses. Several zoonotic agents can be a cause of abortions in ruminants. Risks for human contamination rise when handling infected animals, during obstetrical acts when giving birth or after that, sometimes when milking abortive females, also after drinking infected or cotaminated milk. Only brucellosis is registered as an abvious bacterial zoonosis in human population of the governorate of Biskra (D.S.P, 2010). Generally, abortions in brucellic ruminants occur in the last third of pregnancy (FONTAINE.M, 1988). But, this don't mean that brucellosis is being the exclusive abortive disease in ruminants, accordingly to be zoonosis, existing on the field in Algeria. We assumed a general study of epidemiological characteristics of abortions in ruminants, according to observations of 31 private veterinary practitioners, through a complete questionnaire.

Materials and Methods

Sampling

Initially, 40 copies of the questionnaire were distributed to a total of 40 veterinarians, using empiric method (Toma, B., *et al*., 2001). Thus, we targeted the majority of private veterinary practitioners in the governorate of Biskra. Finally, 31 questionnaires were analyzed, representing thus 59.61% of private veterinary prictitioners in the whole territory of the governorate (n = 52) (D.S.V., 2010).

Conducting the Survey

We elaborated a questionnaire especially for private veterinary practitioners. A part of this questionnaire targeted to collect some epidemiological informations about the observed abortions in ruminants according to regions (n=12), frequencies of occurrence per annum (1= once per day, 2= many per day, 3= once per week, 4= many per week, 5= once per month, 6=many per month, 7= many per year), frequencies of occurrence per animal species using a numeric classification scale (1,2,3), seasons of high risk, epidemiological form (1=sporadic, 2=enzootic in herds, 3= enzootic in region, 4= epizootic in herds, 5= epizootic in region, 6= other forms), pregnancy stage of high risk of occurence (1= First trimester, 2= Tound trimester, 3= Third trimester, 4= other forms), possibility of differentiation between brucellic abortions form and other types of abortion (1= always, 2= sometimes, 3= never). Distribution of questionnaires, began January 5, and ended May 25, 2010. In general, if the veterinarian was available and had a time vacuum, an interview was conducted with him for a period not exceeding 15 minutes on average. Otherwise, the questionnaire was left at home to recover next week. Also, we collected some data about numbers and geographic distribution of ruminants and private veterinary practitioners in the governorate from the Directorate of Veterinary Services of Biskra (D.S.V, 2010).

Statisticsal Analysis

Microsoft Excel xp. 2007, was used to determine descriptive histograms. Then, data

collected from questionnaires were entered a computerized database and statistical analysis was performed by SPSS software. Also, a Chi-square test was applied within a contingency crosstabulation ($p < 0.05$) to detect any correlation between the variable « region » and the variable « frequencies of occurrence per annum ».

Results

Our questionnaire included 59.61% of private veterinary prictitioners active on the whole territory of the governorate of Biskra, distributed on 3 types of municipalities ; civic , nearly civic and rural geographic situantion (Table 1), in addition to a professional experience ranging from 2 to 25 years.

Table 1: Frequencies of questioned veterinarians per municipality of activity in the region of Biskra.

Municipality	Frequency	Percent	Valid Percent	Cumulative Percent
Biskra	2	6,5	6,5	6,5
Hadjeb	1	3,2	3,2	9,7
Sidi Okba	3	9,7	9,7	19,4
El'Outaya	3	9,7	9,7	29,0
Tolga	5	16,1	16,1	45,2
Lioua	2	6,5	6,5	51,6
El'Ghrous	2	6,5	6,5	58,1
Chaiba	1	3,2	3,2	61,3
Doucen	4	12,9	12,9	74,2
Ouled Djellal	2	6,5	6,5	80,6
Sidi Khaled	5	16,1	16,1	96,8
El'Faidh	1	3,2	3,2	100,0
Total	**31**	**100,0**	**100,0**	

Great majority of respondents have mentioned autumn as the highest risk period of abortions in ruminants, followed by winter, than summer (Table 2).

Table 2: Frequencies of high risk periods of observed abortions in ruminants of the region of Biskra.

High risk periods	Frequency	Percent	Valid Percent	Cumulative percent
Aut.	8	25,8	25,8	25,8
Win.	7	22,6	22,6	48,4
Aut-Win.	6	19,4	19,4	67,7
Win.-Sum.	3	9,7	9,7	77,4
Aut.-Win.-Sum.	1	3,2	3,2	80,6
Aut.-Spr.	1	3,2	3,2	83,9
Spr.	1	3,2	3,2	87,1
Sum.	2	6,5	6,5	93,5
Aut.-Sum.	1	3,2	3,2	96,8
Four seasons	1	3,2	3,2	100,0
Total	**31**	**100,0**	**100,0**	

Aut.= Autumn- Win.=Winter-Spr.= Spring- Sum.=Summer

The most observed frequency of occurrence of abortions is « many per annum » (45.2 %), followed by « many per month » (32.3 %) (Table 3).

Table 3: Frequencies of occurrence of observed abortions per annum in ruminants of the region of Biskra.

Observed abortions according to frequencies in time	Frequency	Percent	Valid Percent	Cumulative percent
Many per annum	14	45,2	45,2	45,2
Many per month	10	32,3	32,3	77,4
Once per month	6	19,4	19,4	96,8
Many per week	1	3,2	3,2	100,0
Total	31	100,0	100,0	

S.= Sheep – G.= Goats – B.= Bovine.

Among surveyed veterinarians, 58.1 % reported that the most observed numeric order classification of abortions according to ruminant species is (1.Sheep, 2.Goats, 3.Bovine) ; 58.1 %, followed by (1.Goats, 2.Sheep, 3.Bovine) ; 38.7 % (Table 4).

Table 4: Frequencies of observed order categories of abortions in ruminants of the region of Biskra.

Observed order categories of abortions	Frequency	Percent	Valid Percent	Cumulative percent
1. S., 2. G., 3. B.	18	58.1	58.1	58.1
1. G., 2. S., 3. B.	12	38.7	38.7	96.8
1.S., 2. B., 3. G.	1	3.2	3.2	100,0
Total	**31**	**100,0**	**100,0**	

The most cited epidemiological form of abortions is (Enzootic in herds with epizootic pics) ; (41.93%), than (Sporadic) ; (29.03%), and (Enzootic in region) ; (19.35 %), (Fig. 1, Table 5).

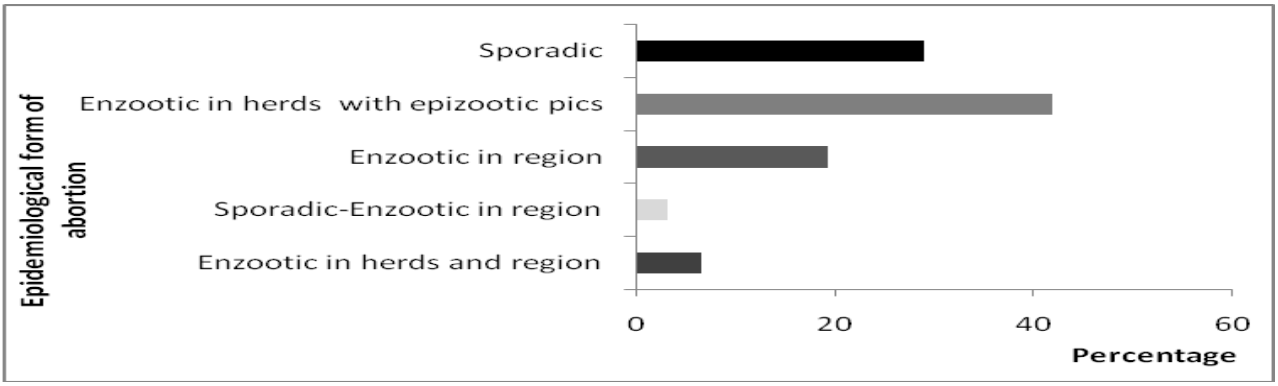

Fig. 1: Percentages of abortion epidemiological forms observed in ruminants of the region of Biskra.

Table 5: Crosstabulation of two variables «Frequency of occurrence of abortions » and «Epidemiological form of abortions »

Epidemiological form of abortions	Frequency of occurrence of abortions				
	once per day	many per day	once per week	many per week	Total
Spo.	**0**	**4**	**0**	**5**	**9**

Enz. in herds with Epi. pics	**1**	**1**	**5**	**6**	**13**
Enz.in region	**0**	**1**	**3**	**2**	**6**
Spo.- Enz. in region	**0**	**0**	**0**	**1**	**1**
Enz. in herds and region	**0**	**0**	**2**	**0**	**2**
Total	**1**	**6**	**10**	**14**	**31**

Spo.=Sporadic- Enz.=Enzootic- Epi.= Epizootic.

The pregnancy stage of high risk of occurence of abortions is (Tound trimester) ; (58.06 %), than (Third trimester) ; (16.13 %), (Fig. 2).

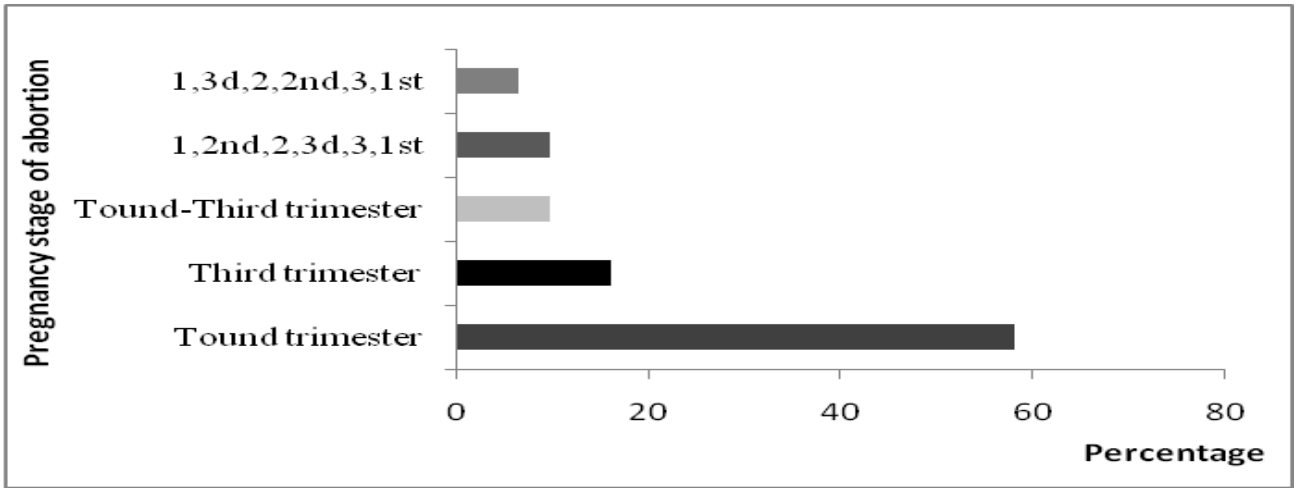

Fig. 2: Percentages of pregnancy stages with high risk of occurence of abortion in ruminants of the region of Biskra.

Concerning the possibility of differentiation between brucellic abortions form and other types of abortion, (Sometimes) ; (54.84%), (Never) ; (32.26 %), (Always) ; (12.9 %), (Fig. 3). Furthermore, Chi-square test showed a high positive significant correlation (r = + 0,03) between the variable « region » and the variable « frequencies of occurrence per annum », (Table 6).

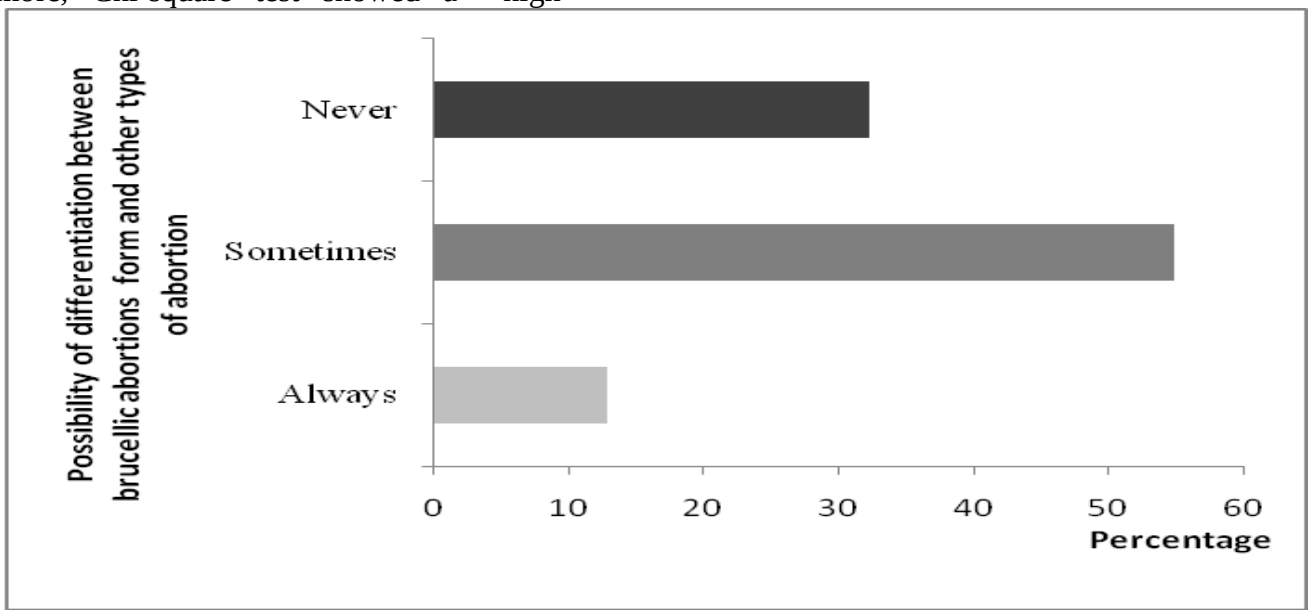

Fig. 3: Percentages of veterinaries's responses concerning the possibility of differentiation between brucellic abortions form and other types of abortion.

Table 6: Chi-square tests correlation result between the variable « region » and the variable « frequencies of occurrence per annum ».

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	59,092[a]	33	,003**
Likelihood Ratio	38,226	33	,244
Linear-by-Linear Association	,678	1	,410
N of Valid Cases	31		

** Correlation is significant at p< 0.05.

While, there was no correlations between the varible « region » and the whole of other variables.

Discussion

The global characteristics of abortion forms observed by private veterinarians (Table 2,3,5, and Fig. 1,2) could be observed in several types of abotion in domestic rumimants with different aetiologies, in a manner that sometimes differential diagnosis seem to be very hard (Table 7, 9, 10).

Table 7: Differential diagnosis of abortions in sheep and caprine (Scott R.R. Haskell, 2001).

Abortion causes	Sheep	Caprine
Akabane	-	+
Border Disease (Bovine Viral Diarrhea)	+	+
Brucellosis	+	+
Campylobacter	+	+
Chlamydia	+ (*C.psittaci*)	+
Leptospirosis	+	+
Listeriosis	+	+
Mycoplasma	+ (*M. ovipneumonia*)	+
Q Fever	+	+
Salmonella	+	+
Yersinia	-	+
Foot and mouth disease	-	+
Parasitic (Toxoplasma gondii)	+	+
Caprine herpesvirus	-	+
Mycotic	+	-
Toxic plants	+	+
Nutritional deficiency / excess	+	+ (deficiency)
Starvation	+	-
Stress	+	+
Copper deficiency	-	+
Vitamin A deficiency	-	+
Selenium deficiency	-	+
Selenium toxicity	+	-
Drugs (in general)	-	+
Levamisolee	-	+
Corticosteroids	-	+
Phenothiazine	-	+

(+) Rapported, (-) Not be rapported.

Table 8 : Differential diagnosis of abortions in cattle according to priority degree and epidemiological situation of abortions in cattle herds of France (Raphaël Guatteo *et al.*, 2011).

Abortion agent	Priority degree
Neosporosis	I
Border Disease (Bovine Viral Diarrhea)	I
Q Fever (*Coxiella burnetti*)	I
Anaplasma phagocytophylum	II
Leptospirosis	II
Listeriosis (*L.monocytogenes*)	II
BoHV-4	II
Chlamydophila abortus	II
Salmonella	II
Campylobacter	III
Blue tongue virus (FCO)	III
IBR-BoHVI	III
Besnoitiosis	IV
Toxoplasmosis	IV

Table 9 : Differential diagnosis of abortions in cattle according to epidemiological form and stage of pregnancy (M.FONTAINE, 1988).

Abortion causes	Epidemiological form	Abortion period
Pyogen germs	Spo./few enz.	variable
Trichomonosis	Ven.	(1^{th}-2^{th}) M.
Brucellosis (*B.abortus*)	Epi.	7^{th} (6^{th}-9^{th}) M.
Campylobacteriosis *(C. fœtus var venerealis)*	Ven.	(5^{th}-6^{th})M.
Chlamydiosis (*C.psittaci var. ovis*)	Cont.	late (6^{th}-9^{th}) M.
Leptospirosis	Spo.	late
Listeriosis	few enz.	± late
Q Fever (*Coxiella burnetti*)	Cont.	late (6^{th}-9^{th}) M.
Genic mutation	Spo.	Fœtal stage mostly
Chromosomic anomalies	Spo.	Earlier
Endocrinian factors	Spo.	Earlier mostly
Nutritional factors	Spo./few enz.	Earlier mostly

Spo.=Sporadic- Enz.=Enzootic- Epi.= Epizootic-Ven.=Venereal-Cont.= Contagious-M.=Month.

Table 10 : Differential diagnosis of abortions in sheep (S) and caprine (C) according to epidemiological form and stage of pregnancy (M.FONTAINE, 1988).

Abortion causes	Epidemiological form	Abortion period
Brucellosis (*B.melitensis*)	Epi. (S++/C++)	(3^{th}-4^{th}) M.
Mycoplasmosis *(M.agalactiae)*	Rare (S±/C+)	later
Chlamydiosis (*C.psittaci var. ovis*)	Epi. (S++/C++)	5^{th} M.
Leptospirosis	very rare(S and C)	-
Listeriosis (*L.monocytogenes*)	Enz. (S+/C±)	(3^{th}-5^{th}) M.
Q Fever (*Coxiella burnetti*)	Epi. (S++/C++)	(3^{th}-4^{th}) M.
Salmonellosis (*S .ovis*)	Epi. (S++/C++)	(3^{th}-4^{th}) M.
Campylobacteriosis (*C. fœtus var intestinalis)*	rare (S)- very rare (C)	(4^{th}-5^{th}) M.
Toxoplasmosis *(T.gondii)*	± enz. (S++/C++)	(3^{th}-5^{th}) M.
Mycoses	Spo.	(4^{th}-5^{th}) M.
Genic mutation	Spo.	Fœtal stage mostly
Chromosomic anomalies	Spo.	Earlier
Endocrinian factors	Spo.	Earlier mostly
Nutritional factors	Spo. /few enz.	Earlier mostly

Spo.=Sporadic- Enz.=Enzootic- Epi.= Epizootic - S.= Sheep- C.= Caprine- M.= Month.

Generally, nomadic breeders transmute their herds from the north of Algeria to the south between the beginning of both autumn and winter. Inversely, they transmute their herds from the south to the north between the starting of both spring and summer (trip of avoiding heat). Traffic measures of animals when transmuting are very difficult, and even followed by various abortion cases. In these conditions, it seem to be impossible to differentiate between traumatic / stress abortions, and infectious abortions. Frequencies of observed order categories of abortions in ruminants of the region of Biskra (Table 4) may be proportionally linked to domestic ruminants density per species. In fact, there is an abvious quantitative dominance of sheep (812 200), than goat (235 700), while cattle represents a little proportion within total of ruminants (3637) (D.S.V., 2011).

Frequency of veterinarians whom have the always possibility of differentiation between brucellic abortion cases and other types of abortion is fewer than frequencies of veterinarians whom have a sometimes possibilty, and never have this possibility (Fig.3). Despite the specific form of brucellic abortive fœtus, it could be easily confused, especially, with mycosal abortive fœtus, or other types of abortion forms (FONTAINE.M, 1988). Observed correlation between the variable « region » and the variable « frequencies of occurrence per annum », (Table 6) could be proportionally linked to space distribution of domestic ruminants in the governorate. Really, according to their wide pasture areas, some municipalities are characterized with high density of small ruminants (Sidi Okba, Chaiba, Doucen, Ouled Djellal, Sidi Khaled, El'Faidh) than others (Biskra, Hadjeb, El'Outaya, Tolga, Lioua, El'Ghrous). Also, this correlation could be attributed to enzootic existence of evantual abortive diseases in some municipalities comparing to others that seem to be relatively safe.

Abortive agents in sheep and goat are so various and complex (Table 7). Several types of abortion factors could exist simultaneously in one herd. Rather, differential diagnosis of abortions requires long veterinarian's experience and high precision technical equipments.

Three pathogens that are infectious causes of significant reproductive loss in sheep and goats and of global importance are Brucella melitensis, Chlamydophila abortus and Coxiella burnetii. These agents are also zoonotic and can be

associated with abortion and systemic flu-like disease with occasional debilitating chronic manifestations in humans (Diana M. Stone, *et al*., 2012). Domestic ruminants and in particular, sheep and goats are the major animal reservoir that leads to human exposure to all three of these agents (Acha and Szyfres, 2001)

In Algeria, the examination of sheep and goats in 1986–1989 revealed an overall seropositivity to brucellosis of 2.18% in sheep and 12.0% in goats. The percentages of infected flocks were however 43.5 and 42% in sheep and goat flocks, respectively. (Refai, 2002). Serosurveillance of brucellosis in bovines in Algeria was conducted by Benelmouffok (1970, 1979), Benelmouffok *et al*., (1984), and, Benaissa and Benaouf (1984). Eastern substantrional sahara of Algeria is dominated by nomadic small ruminants breeding system, with high rate of brucellosis in animals (Boudilmi, 2001). A little improvement had been observed after the use of Rev-1 vaccine in small ruminants herds (2006 - 2012). Serologic tests may fail to detect brucellic infection prior to pregnancy or abortion (Stuen and Longbottom, 2011).

Chlamydophila abortus causes a disease in sheep known as Enzootic Abortion of Ewes (EAE) (Aitken, 2000, Longbottom and Coulter, 2003). It is the most common infectious cause of abortion in lowland flocks intensively managed at lambing time and has a major economic impact on agricultural industries worldwide (Pospischil, 2005 ; Kerr *et al*., 2005). Enzootic abortion of ewes has become recognized as a major cause of loss in sheep in Europe, North America and Africa also it is the most common infectious cause of lamb loss in the UK, accounting for around 50 % of all diagnosed causes of abortions (Aitken, 2000). In a serological study realized in 4 sheep flocks in Ahvaz, southwest of Iran, about 9 % of the sheep considered in this study were positive to Chlamydophila abortus , at S/P % above of 90 in ELISA test (Msoud, G. *et al*., 2007). The most recommended method for diagnosis of animal chamydiosis is the Complement Fixation Test (CFT) (OIE, 2004). However, the technique is difficult, of limited sensitivity (Msoud, G. *et al*., 2007). Also, isolation of Chlamydophila abortus require specialized facilities and personnel experienced in cell culture (Buendia et al., 2000).

In Tunisia, where climate is comparatively similar to the eastern region of Algeria, results of a serological study realized by Rekiki, A., *et al*., (2005), showed that chlamydiosis constitutes one of the major causes of abortion in small ruminants. Also, this study has demonstrated the real existing of polyinfection cases in small ruminants, the high prevalence of border disease and the existing of infections which are not usually diagnosed, as salmonellosis, toxoplasmosis. Further, infections wich have a high zoonotic risk were detected ; Q fever, and with lesser prevalence ; brucellosis (Rekiki A. *et al*., 2005).

Coxiella burnetii is considered to have a worldwide distribution with higher prevalence in areas with concentrated numbers of sheep and goats (Raoult *et al*., 2005). There are no vaccines commercially available for protection of sheep and goats against C. burnetii (Diana M. Stone, *et al*., 2012).

Neosporosis is among the most parasitic abortive diseases in cattle (Table 8).In a study realized by Ghalmi.F, *et al*., (2012), in a sample of cattle belonging to 87 farms of the north and northeast of Algeria The seroprevalence of Neospora caninum in local cattle (34.28%) was significantly higher ($p<0.05$) than in modern (16.04%) and improved (18.64%) cattle. The risk factors analysis indicated that cattle population, geographical location, dog presence, season, global farm hygiene or the presence of abortion were significantly associated with seroprevalence (Ghalmi.F, *et al*., 2012). We can't reject the probability of existence of neosporosis in cattle of the substantrional sahara of Algeria. Occurrence risks of neosporosis contamination could be linked to cattle trade traffic, cattle transmuting when avoiding heat stress during spring-summer period, dogs trade traffic, or dogs travel movements when accompagning transmuted cattle especially in nomadic breeding system.

Blue tongue (BT) is a Culicoides transmitted disease. It affects both of sheep and bovine herds.

Some serotypes are abortive in cattle herds (Table 8). BT virus serotype 2 (BTV-2) appeared in North Africa in December 1999 and caused a total of 14 775 clinical cases and 1 286 deaths in sheep. This arthropod-borne viral disease was first reported by the Tunisian veterinary services in 1999 followed by the Algerian authorities in 2000 and has been described in adult sheep only (Hammami S., 2004). An outbreak of BT disease occurred in central Algeria during July 2006. A total of 5245 sheep in the affected region were considered to be susceptible with 263 cases and 36 deaths. BTV serotype 1 (BTV-1) was isolated and identified as the causative agent. Segments 2, 7 and 10 of this virus were sequenced and compared with other isolates from Morocco, Italy, Portugal and France showing that they all belong to a 'western' BTV group/topotype and collectively represent a western Mediterranean lineage of BTV-1(Cêtre-Sossah, C., *et al*., 2011, Dolores Buitrago and Concepción Gómez-Tejedor, 2012). Sheep in the governorate of Biskra was among the BT most affected animal species, especially during 2000. The control strategy in Algeria was based on vector control (Hammami, S., 2004). No study tried to evaluate the relashionship between abortions and BT infection in the region of Biskra. During the incursion of BTV- 8 in France in 2007, an increase in the number of abortions in cattle was observed. A survey of all the reported cases of abortion in cattle from November 2008 to April 2009 was conducted in the Nièvre district (Burgundy region), BTV-8 was present in 16% of the fetuses or newborn calves that died within 48 h from 780 dams (Zanella, G., *et al*., 2012).In France, exposure to the BTV-8 virus under natural conditions in previously naive dairy herds notified after clinical suspicion during the 2007 epizootic was associated with an increase in the occurrence of abortions, regardless the stage of pregnancy. BTV-8 exposure during the first 3 months of gestation was associated with a 15% increase in late return-to-service for cows with no return-to-service at 90 days, while this increase was 6% for exposure starting from the third month of gestation (in outbreaks detected in september). BTV-8 exposure from the third month of gestation was associated with a 1.9% increase of short gestations. The effect of exposure was more pronounced for outbreaks detected early in the epizootic compared with those detected later (Nusinovici S., *et al*., 2012).

Some serotypes of Foot and Mouth disease (FMD) virus can cause abortions in cattle and goats (Table 7). Algerian bovine herds are annually vaccinated against some serotypes of FMD virus (M.AD.R. ; 2010).

Mycotic abortion is a sporadic disease, occurring throughout the world and affecting a smaller percentage of animals in a herd (Tell, 2005). Fungus are absorbed from the gastrointestinal tract following ingestion of food (forage and silage) poorly preserved or moldy. No demarcating symptom has been noticed in the affected animal before or after expulsion of dead foetus. Different species of fungus causes abortion at different stage of gestation (Aspergillus, Mucor, Candida, etc.). Abortions may occur at 6-8 months of gestation in case of Aspergillus *spp.* (Mc Causland *et al*., 1987). In case of Phycomycetes abortion may occur at 5-7 months. Candida sp can cause abortion at 5-6 months of gestation (Foley and Schlafer, 1987). Hot and humid conditions in cow sheds favour the fungal multiplication and growth. Stress due to climate change or unconducive weather will also allow the fungal spore germination and its dispersal (Dalling, 1966). Immunocompromised animals or animals undergoing prolonged antibiotic therapy are also susceptible to fungal infection and ultimately leads to abortion. Changing climate scenario ,also, have a great influence on the occurrence of mycotic abortion in livestock (Stableforth and Galloway, 1959). The mycotic abortions are usually sporadic and they are often followed by adnexal retention (FONTAINE, M., 1988).

Once it forms the eastern passage to Algerian desert, the governorate of Biskra is a gathering point to transmuted breeders from the northeast of Algeria. In fact, small ruminants breeders want to profit from its rich forage resources and steppic plants during the harsh winter months. Summer in

the region of Biskra is very hot, so that breeders fear much that heat could be harmful to their ewes and lambs. For this reason, the majority of them prefer to transmute to wilayas with a milder climate or more cooler in the summer. In general, this operation starts from mid-March and continues until early July, and the return trip home would be programmed mostly between next September and November. Another type of transhumance which could take place; within the limits of the governorate. It operates alternatively, between breeders of eastern municipalities of the governorate (Faidh, Zeribet El Oued, Sidi Okba, Ain Nagua) and those of the western board (Ouled Djellal, Besbes, Sidi Khaled, Chaiba, Ras El Miâad). This internal migration is in search of pasture and water in main time. In conclusion, for all these types of trip, animals congregate at the same water and the same fields, thus promoting the spread of abortive agents in herds previously free. For example, in northern Jordan, maintaining brucellosis and contamination of farmers and veterinarians are encouraged by the uncontrolled circulation of cattle across borders and blend on grazing areas or markets (Abo-Shehada MN.et Col, 1996).

On the other hand, artificial insemination, performed today with a disposable material, limits significantly the risk of spread of diseases transmitted by breeders practicing public riding system, or even by using the same breeding males in farm, which necessarily can spread germs from one female to another, espeacially after abortion (Dominique Soltner, 2001).

Conclusion

Abortive causes in ruminants are so various, and with no specific symptoms in the main time. The high rate of enzootic and epizootic abortion forms could be an indicator of an evantual existence of a diversity of zoonoses not detected yet, in the governorate of Biskra. Diagnosis with high precision requires laboratories with well-founded equipments. Techniques with high specificity and sensibility as P.C.R and E.L.I.S.A should be widespread.

Also, the system of livestock census should be improved to obtain more accurate data on abortive animal populations living in each governorate. At the same time, the establishment of a practicable system of animal identification is very important to ensure epidemiological control. Generally, epidemilogical data as stage of pregnancy when occurs abortion, histopathological aspect of fetuses, frequency of occurrence of abortions in space and time, are not sufficient to a full diagnosis. In addition, the serodiagnosis of infectious abortions, although it is commonly used in veterinary medicine, however, is difficult to interpret because we don't know if there is a correlation between the serological rates observed and abortions aetiology.To confirm the strong serologic suspicion, it is essential to use a direct diagnosis as bacterioscopy and highlighting antigens or nucleic acids. Thus, we need forming a qualified laboratory team for each governorate.

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