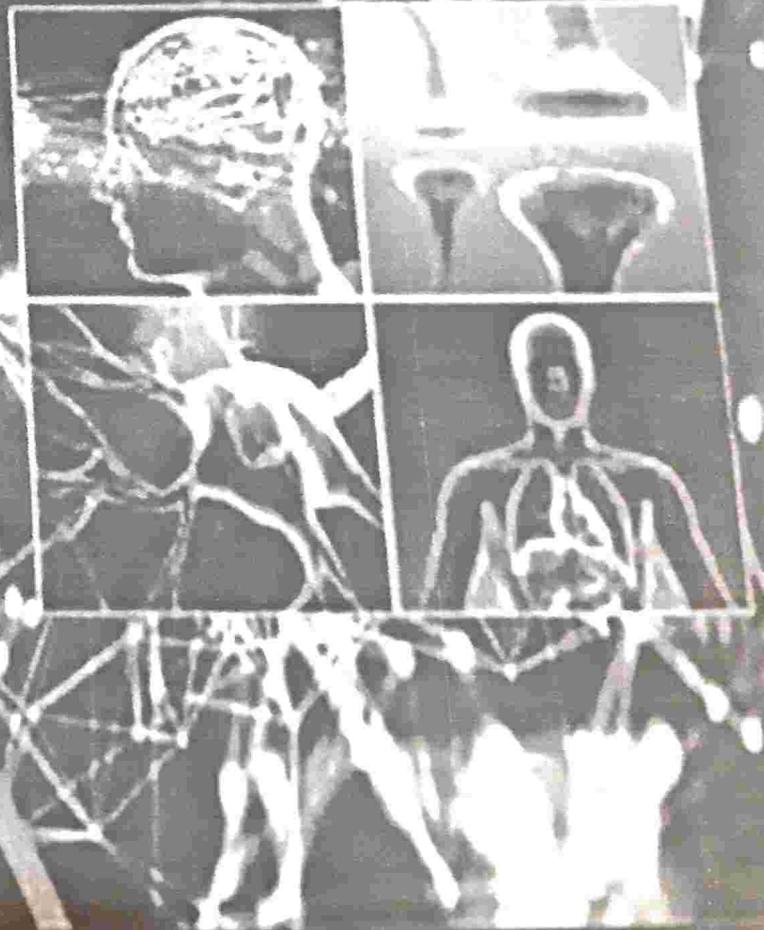
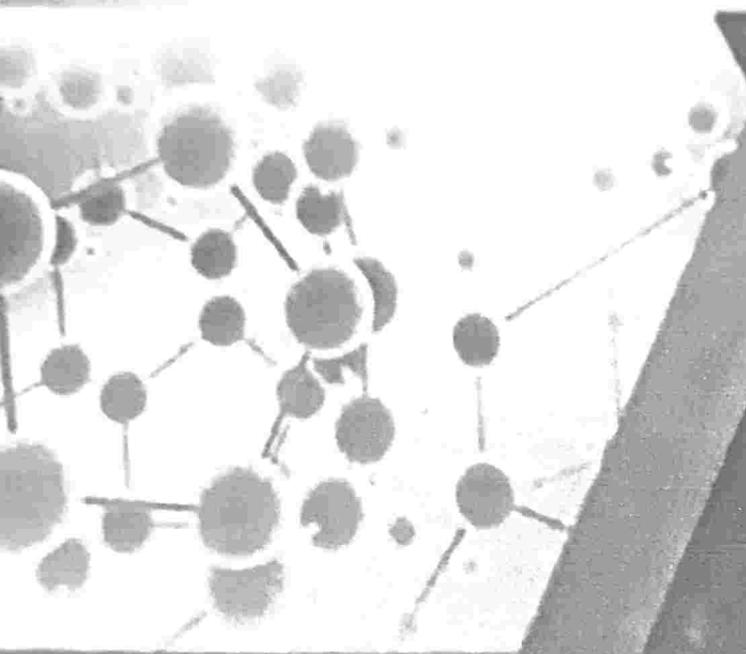




**EJMCM**

**EUROPEAN JOURNAL OF  
MOLECULAR & CLINICAL MEDICINE**

**ISSN 2515-8260**



[www.ejmcm.com](http://www.ejmcm.com)

[editor@ejmcm.com](mailto:editor@ejmcm.com)

# Pathomorphology In Subclinical Brucellosis In Guinea

Z.B. Mamatova<sup>1</sup>, Yusuf Sidime<sup>2</sup>, Forster Khaba<sup>1</sup>, M.K. Yuldasheva<sup>4</sup>, U.K. Yuldashev.<sup>5</sup>

<sup>1</sup>*Samarkand veterinary medicine institute (Uzbekistan), State veterinary medicine institute (Dalaba, Guinea), Samarkand state medical institute (Uzbekistan).*

<sup>2,3</sup>*State veterinary medicine institute (Dalaba, Guinea).*

<sup>4</sup>*Samarkand veterinary medicine institute (Uzbekistan)* <sup>5</sup>*Samarkand state medical institute (Uzbekistan).*

## 1. INTRODUCTION

Brucellosis is an acute and chronic infectious disease of many animal species and humans. The variety of forms and brucellosis course still amaze researchers studying the problems of this disease. Changing conditions for keeping animals in the intensification direction and concentrated keeping, feeding animals with feed treated with various chemical and bacterial preparations, changes in the ecological atmosphere conditions lead to a change in the resistance and many other properties of pathogenic microorganisms - causative agents of infectious animal diseases, and, accordingly, the clinical manifestation of the disease and its consequences can also change.

Therefore, we set the of pathoanatomical signs study in the subclinical course of brucellosis in cattle in a herd with a different course and immune background of this disease as the aim of our research.

## 2. MATERIALS AND RESEARCH METHODS

As study object, we have selected the regions in Guinea by the fact that for study period in Cancan, among the available livestock (94408) of cattle, the brucellosis incidence was 2, 5% according to the State livestock administration of Guinea.

The survey included 86 cows and 14 bulls. The study was carried out on the basis of the epizootological data analysis, clinical signs, pathological changes and serological data. All studies were carried out using generally accepted methods.

## 3. RESEARCH RESULTS

The Republic of Guinea is one of the African countries with an equatorial climate, where humidity reaches 5000 mm per year, with an extensive level of cattle breeding. Livestock is kept loose, grazing on its own all year round in the forests and meadows close to the settlements.

The questionnaire and examination results showed the clinical signs presence of the disease in 29 animals out of 206, which made up 14,07%. For our further research, we selected 100 animals (86 cows, 14 bulls), including 29 heads, with obvious brucellosis symptoms (abortion, barrenness, hygroma) and took blood serum from them for serological studies. After that, all 100 head of cattle were subjected to slaughter and pathoanatomical examination.

Table 1. The results of animals' clinical examination and animal owners questionnaires.

Number of examined animals	Number of animals with clinical signs	Observed signs of brucellosis		
		Abortion	Barrenness	Hygroma

1	206	29	17	5	2
---	-----	----	----	---	---

The comparative analysis of the observed clinical signs, pathoanatomical changes and serological data results are presented in Table 2. The table shows that in 12 recently (from 3 to 17 days) aborted animals, the uterus was enlarged up to 1.5 times, its walls thickened. The uterus carbuncles in each abortion case were enlarged, with hemorrhages and did not separate from the membranes. In the other 5 cows, a slight increase in the uterus and a slight thickening of the walls were noted, which is explained by the pathology remoteness and the acute transition process to the subclinical form, since these animals showed seropositivity. Among animals with a clinical picture of the disease, 14 positively reacted serologically.

Table 2. A comparative analysis of clinical signs, pathoanatomical changes and serological data results

	Pathological changes	Number of animals with clinical signs (29)	Number of animals serologically responding (58)	Number of animals with both clinical signs and serologically responding (71)	Number of animals with no clinical signs and no serological response (29)	The number of animals who has brucellosis culture was isolated in the pathological material
1	In the uterus	12+5	16+3	14	-	33
2	In the liver	1	11	11	1	24
3	Abscesses	2	-	2	-	4
4	Fluid in joints	2	2	-	-	4
5	Pus in the joints	1	1	-	-	1
6	Scrotal necrosis	-	1	-	-	1
7	Pustules in the seed appendages	-	1	-	-	-
8	Meningoencephalitis	-	-	-	2	2
9	In the lymph nodes	17	-	-	4	15
	Total	23	52	27	7	37

In 2 animals, brucellosis of which manifested itself as bursitis and hygromas, a slightly yellowish transparent liquid, a small amount of fibrin (1 animal), and pus (1 animal) were found in them. A large number of plasma cells were noted on the mucous membrane, and leukocytes in case of purulent bursitis.

From 58 cows that reacted serologically but clinically had no disease signs, 16 had a normal sized uterus without inflammation signs, however, histosections revealed nodules of proliferative reticuloendothelial cells, sclerotic changes and fibroblasts proliferation; 11 animals in the liver - granulomas from lymphoid elements and histiocytes; in 17 out of 58 animals in the lymph nodes, spleen, the cellular elements transformation of lymphocytes into plasma was observed.

In the uterine cavity of 3 cows that did not have disease clinical signs, but reacted positively, delayed afterbirth was found in a grayish, in 1 case brown, turbid liquid.

In one bull that did not have clinical signs of the disease, however, reacted positively serologically during a pathological autopsy, it was noted the scrotal membrane fusion with necrosis foci containing dry, dense masses of yellowish color. In the seminal adnexa it was observed partial necrosis of the tubular epithelium, the 3 abscesses presence, encapsulated 2 nodules and diffuse growth of connective tissue. In histological sections prepared from these organs, were observed layering loss, degeneration, the epithelium disintegration of the seminiferous tubules and leukocytes infiltration.

In addition, in 2 animals, partial brain inflammation and its membranes (meningoencephalitis), the spinal cord membranes (cerebrospinal meningitis), and its substance (poliomyelitis), the nerve nodes lesions and spinal nerves roots (ganglioradiculitis) and the somatic and vegetative systems (poliomyelitis) with a degeneration predominance, although externally and serologically this was not revealed.

In 2 cases, small abscesses were noted under the skin in the joints area of the fore and hind limbs, in 1 case - in the internal organs (liver) and inguinal lymph nodes.

From the data presented in Table 2, it follows that characteristic pathoanatomical changes do not always "accompany" the diagnosis based on abortion and infertility (23 out of 29), as well as seropositivity in Wright's reactions and binding a compliment (52 out of 58). At the same time, the characteristic pathoanatomical signs of brucellosis, such as meningoencephalitis, abscesses under the skin and in the liver, may accompany the subclinical course of the disease, in which neither external signs of the disease nor serological activity are recorded in the animal (7).

According to these studies results, there is a 100% correlation between the bacteriological examination results (37 cultures) either with the serological examination data (23 animals) or with the clinical methods data (29). A brucellosis culture was isolated from 29 animals with both clinical signs and serological positivity, and the diagnosis confirmation of brucellosis in the clinic and serological activity absence was observed in 7 subclinical course cases of the disease (100%), which indicates the importance of bacteriological analysis in this disease in conditions of loose keeping of animals.

#### 4. CONCLUSIONS.

- the clinical manifestation of brucellosis correlated with pathological and anatomical changes and serological indicators in 23 cases out of 29 (79%).
- the pathoanatomical manifestation of the disease correlated with the serological studies rates in 52 cases out of 58 (89.5%).
- the pathoanatomical changes of brucellosis in cattle were expressed in 7 cases, but were not confirmed by serological studies and clinical signs, in a 100% correlation with bacteriological analysis data, which may be the subclinical course indicator of brucellosis in animals herd with different immune background against this disease.

#### 5. REFERENCES

- [1] Kerem E, Diav O, Navon P, Branski D. Pleural fluid characteristics in pulmonary brucellosis. *Thorax*. 1994 Jan; 49(1):89–90. <https://doi.org/10.1136/thx.49.1.89> PMID: 8153949
- [2] Byndloss MX, Tsolis RM. *Brucella* spp. Virulence factors and immunity. *Annu Rev Anim Biosci*. 2016; 4: 111–127. <https://doi.org/10.1146/annurev-animal-021815-111326> PMID: 26734887
- [3] Ko J, Splitter GA. Molecular host-pathogen interaction in brucellosis: current understanding and future approaches to vaccine development for mice and humans. *Clin Microbiol Rev*. 2003 Jan; 16(1):65–78. <https://doi.org/10.1128/CMR.16.1.65-78.2003> PMID: 12525425
- [4] de Figueiredo P, Ficht TA, Rice-Ficht A, Rossetti CA, Adams LG. Pathogenesis and immunobiology of brucellosis review of *Brucella*–host interactions. *Am J Pathol*. 2015 Jun;

- 185(6):1505–17. <https://doi.org/10.1016/j.ajpath.2015.03.003> PMID: 25892682 [5] Challoner KR, Riley KB, Larsen RA. Brucella meningitis. *Am J Emerg Med.* 1990; 8: 40–42. [https://doi.org/10.1016/0735-6757\(90\)90293-9](https://doi.org/10.1016/0735-6757(90)90293-9) PMID: 2293833
- [6] Demiraslan H, Metan G, Mese EA, Yildiz O, Aygen B, Sumerkan B, et al. Neurobrucellosis: an evaluation of a rare presentation of brucellosis from a tertiary care centre in Central Anatolia, Turkey. *Trop Doct.* 2009 Oct; 39(4):233–5. <https://doi.org/10.1258/td.2009.080430> PMID: 19762578
- [7] McDermott J, Grace D, Zinsstag J. Economics of brucellosis impact and control in low-income countries. *Rev Sci Tech.* 2013 Apr; 32(1):249–61. <https://doi.org/10.20506/rst.32.1.2197> PMID: 23837382
- [8] Golding B, Scott DE, Scharf O, Huang LY. Immunity and protection against *Brucella abortus*. *Microbes Infect.* 2001 Jan; 3(1):43–8. [https://doi.org/10.1016/s12864579\(00\)01350-2](https://doi.org/10.1016/s12864579(00)01350-2) PMID: 11226853
- [9] Svetić A, Jian YC, Lu P, Finkelman FD, Gause WC. *Brucella abortus* induces a novel cytokine gene expression pattern characterized by elevated IL-10 and IFN-gamma in CD4+ T cells. *Int Immunol.* 1993 Aug; 5(8):877–83. <https://doi.org/10.1093/intimm/5.8.877> PMID: 8104472
- [10] Fernandes DM, Jiang X, Jung JH, Baldwin CL. Comparison of T cell cytokines in resistant and susceptible mice infected with virulent *Brucella abortus* strain 2308. *FEMS Immunol Med Microbiol.* 1996 Dec 31; 16(3–4):193–203. <https://doi.org/10.1111/j.1574-695X.1996.tb00136.x> PMID: 9116636
- [11] Vitry MA, De Trez C, Goriely S, Dumoutier L, Akira S, Ryffel B, et al. Crucial role of gamma interferon-producing CD4+ Th1 cells but dispensable function of CD8+ T cell, B cell, Th2, and Th17 responses in the control of *Brucella melitensis* infection in mice. *Infect Immun.* 2012 Dec; 80(12):4271–80. <https://doi.org/10.1128/IAI.00761-12> PMID: 23006848
- [12] Vitry MA, Hanot Mambres D, De Trez C, Akira S, Ryffel B, Letesson JJ, et al. Humoral immunity and CD4+ Th1 cells are both necessary for a fully protective immune response upon secondary infection with *Brucella melitensis*. *J Immunol.* 2014 Apr 15; 192(8):3740–52. <https://doi.org/10.4049/jimmunol.1302561> PMID: 24646742
- [13] Oliveira SC, Harms JS, Banai M, Splitter GA. Recombinant *Brucella abortus* proteins that induce proliferation and gamma-interferon secretion by CD4+ T cells from *Brucella*-vaccinated mice and delayed type hypersensitivity in sensitized guinea pigs. *Cell Immunol.* 1996 Sep 15; 172(2):262–8. <https://doi.org/10.1006/cimm.1996.0241> PMID: 8964089
- [14] Zhan Y, Kelso A, Cheers C. Differential activation of *Brucella*-reactive CD4+ T cells by *Brucella* infection or immunization with antigenic extracts. *Infect Immun.* 1995 Mar; 63(3):969–75. PMID: 7868269
- [15] He Y, Vemulapalli R, Zeytun A, Schurig GG. Induction of specific cytotoxic lymphocytes in mice vaccinated with *Brucella abortus* RB51. *Infect Immun.* 2001 Sep; 69(9):5502–8. <https://doi.org/10.1128/IAI.69.9.5502-5508.2001> PMID: 11500423
- [16] Mackay LK, Carbone FR. CD4 helpers put tissue-resident memory cells in their place. *Immunity.* 2014; 41: 514–515. <https://doi.org/10.1016/j.immuni.2014.09.018> PMID: 25367567
- [17] Mucosal CD8+ TRM cells protect against virulent *Brucella* challenge
- [18] PLOS Pathogens | <https://doi.org/10.1371/journal.ppat.1008176> January 17, 2020 31 / 31