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Full Length Research Paper

Epidemiology of Brucellosis in Albania: Focus on the Southern and Southeastern Regions

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Brucellosis is a bacterial infectious disease caused by Brucella melitensis. The infection from Brucella melitensis is a known fact and one of the most important challenges to human health, having big economic and financial consequences, especially in countries where the disease is endemic, such as Albania. In the last 20 years the frequency of the spread of zoonozes in Albania is increasing in a considerable way, especially in the southern and south-eastern region where it is more vulnerable. The knowledge regarding the frequency of brucellosis, the time, space and age dynamics and the ways of its transmission are the purpose of this study. The exploring of the structure of the brucellosis infection enables the presentation of a more complete picture on its epidemiological prophylaxis and on the identification of the mechanisms and links that can interact to prevent and eliminate the brucellosis infection in human beings.

Keywords: brucellosis, zoonozes, serologic method, epidemiology.

INTRODUCTION

Brucellosis is one of the common bacterial zoonosis caused by organisms belonging to brucella sort. In Albania, the brucellosis has an early origin. The first case in humans was discovered in 1925 in the district of Gjirokastra. We undertook to carry out this study for the period from 2005-2009, based on the fact that Gjirokastra district currently remains the most problematic district all over the country, in terms of brucellosis infection in animals and in humans, but also because of the fact that brucellosis is ranked being the first bacterial infectious disease. The highest frequency of brucella that causes brucellosis in our country is Brucella melitensis. (Bricker B.J.and Holling S.M)

The brucellosis infection is taken through direct ways i.e. from the contact with the infected animals (the shepherds, veterinarians, laboratory employee, meat, milk, cheese and skin processing employees) and/or indirect way i.e. from the consumption of livestock products and contaminated by-products. (Brinley and Corbel, 1990) In addition to the general treatment of the brucellosis infection, the dynamics to human beings is of high importance.

The cases of disease in humans occur after eating the contaminated food with brucela because of the contact of the brucellas with the mouth mucosa. But the brucelas can penetrate and can cause diseases through the mucosa of the nose, eye, as well as when they enter to the scratches and minor skin cuts.

In order to better recognize the current state of brucellosis, its general epidemiological perspective and the preventative measures it is needed to reflect the dynamic of isolated brucellosis in the bacteriological laboratories. The study is important to present the brucellosis due to the health and economic impact it has. Out of the researches conducted in the recent years there has resulted that the infection is spread not

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only to the livestock and people, but also in the environment, due to the non functioning of the technical structures that keep the disease under control, such as:

- inefficient functioning of the veterinary service structures;
- lack of carrying out diagnostic measures;
- lack of elemination of livestock found to be positive on brusellosis;
- lack of control of dairy products;
- uncontrolled movements of livestock within the country and abroad.

For these reasons, in epidemiological terms, the brucellosis infection is a social risk, as the number of people with brucellosis is growing. (Carbel MY).

The purpose of this study is to present as much data as possible, related to this disease by analyzing:

- Prevalence of brucellosis in humans in the southern and south-eastern region of Albania, during 2005-2009.
- Seasonal character.
- The most affected age groups.
- Prevalence of brucellosis in the region by sex.
- Hygienic and sanitary measures taken for the elimination of brucellosis in the future.

Brucellosis is a disease that has a variety of clinical manifestations and it can be found in its five forms:

1. Hidden Brucellosis (primary, secondary)
2. Acute Brucellosis
3. Sub-acute Brucellosis
4. Chronic Brucellosis (primary, secondary).
5. The remaining after the treatment of Brucellosis.

The acute period of infection lasts three months. After 6 months, the chronic phase of the disease starts.

The epidemiological surveillance of brucellosis is of high importance, especially on the endemic countries, where Albania is included.

MATERIALS AND METHODS

Measures taken

The sampling for the bacteriological examination was taken from the individuals who after the checking resulted to have brucellosis. (Andoni, 1983). From the vein of the arm it is taken 5-7 ml of blood, which is poured in small sterile bottles. The blood is centrifuged in the laboratory and from there the serum is removed.

The identification of brucellosis is made through the agglutination test and A.$ Right test. During the analysis both methods were used at the same time in order to get more accurate result.

Evidence of agglutination

We spill with a pipe some drops of serum divided in two parts over a glass. We pour in one of them some drops of antigen from Brucella melitensis or rose Bengal. The serum of the person who is thought to be infected by brucellosis is mixed well with the antigen for a few seconds and it is carefully observed with the naked eye. If there is agglutination, the result is positive and the vice versa. The remaining part of the serum is kept as evidence to not come up to false results. The analysis is carried out under the temperature of 22-27^{0}C and the result is defined after 2 minutes. This method is fast but not very accurate.

Wright Test

The proof of A. Wright is carried out to get a more accurate result by determining the agglutination amount in the serum of patients. In two rows of tubes it is done the serum dilution starting from a dilution of 1:40 in the first tube reaching to 1:1280 in the ninth tube. Whereas the tenth tube serves to check the antigen, where is not poured the diluted serum.

In all the test tubes with the diluted serum is poured 0.25 ml antigen. The antigens are kites produced at the Institute of Hygiene in Tirana. The test tubes are incubated in the thermostat at a temperature of 37°C for 24 hours. In cases where the antibodies are present the process of agglutination occurs and there happens a positive reaction.

The degree of agglutination is determined by observing the degree of clarity without shaking the test tubes.

The complete agglutination is marked with four + (++++).

The 75% clarity with an almost complete agglutination is marked by three + (+++). The 50% clarity, with significant agglutination is marked with double + (++).

The 25% accuracy with a little agglutination is marked with one + (+).

The test tubes without clarity and without agglutination are considered as negative.

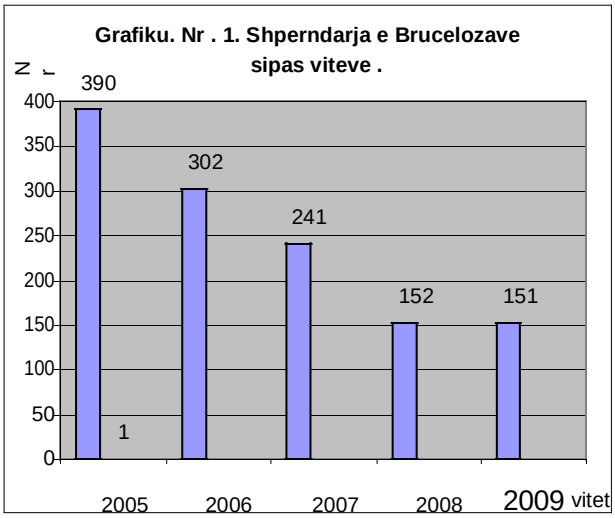
THE RESULTS OF THE STUDY

Descriptive study

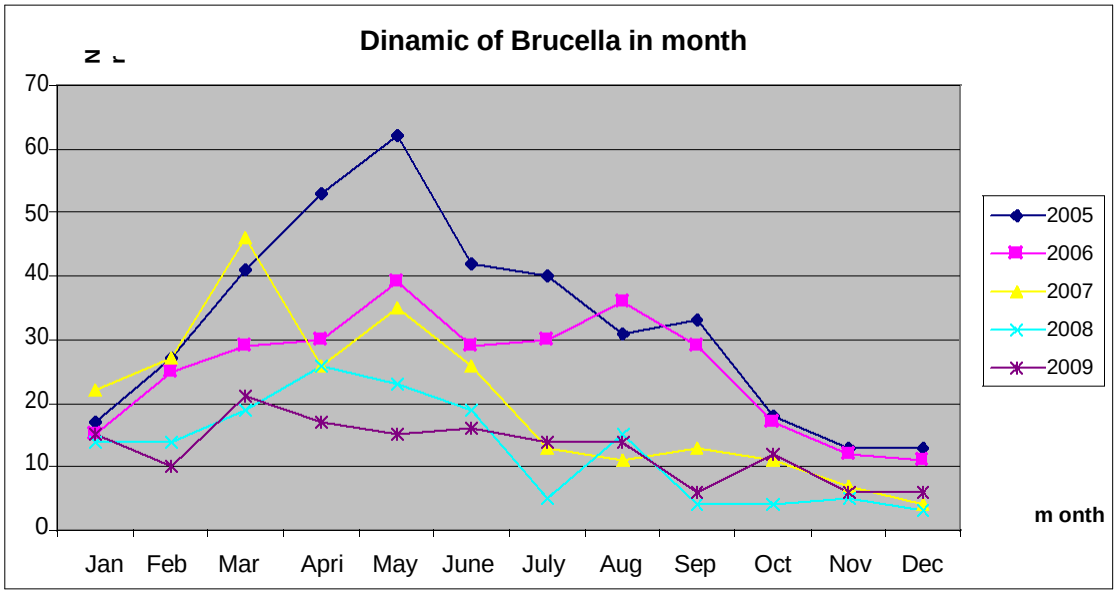
During the years 2005-2009 in the South and Southeast Region (Gjirokastra, Tepelena, Përmet, Korça), of Albania, there have been isolated and identified 1236 cases of brucellosis in sick people and carriers. (Andoni, 1983)

The infected individuals have displayed the following symptoms considered to be major: fever (100%), chills (100%), night sweats (94%), fatigue (94%), irregular sleep (81%), headache (68%), anorexia (81%) and irritability by toxic (92%).

The distribution of cases having Brucelar infection is given in Graph No. 1, on yearly basis. There is evident



Graphic 1. Distribution of brucellosis in years



Graphic 2. Dinamic of Brucella in months

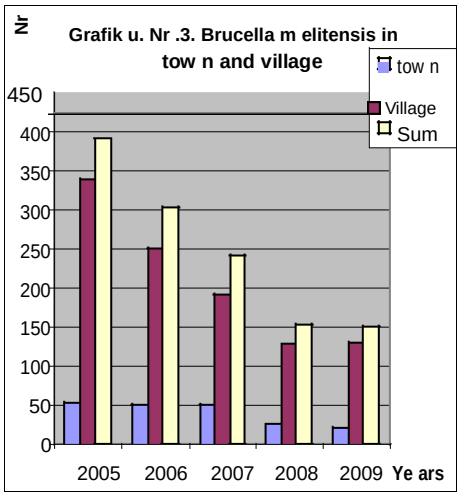
the trend on the decrease of the number of cases infected by Brucellosis. (Babameto, 1957). This tendency is much more evident in the smaller regions having small number of sheep and goats such as Përmet.

Analytical study

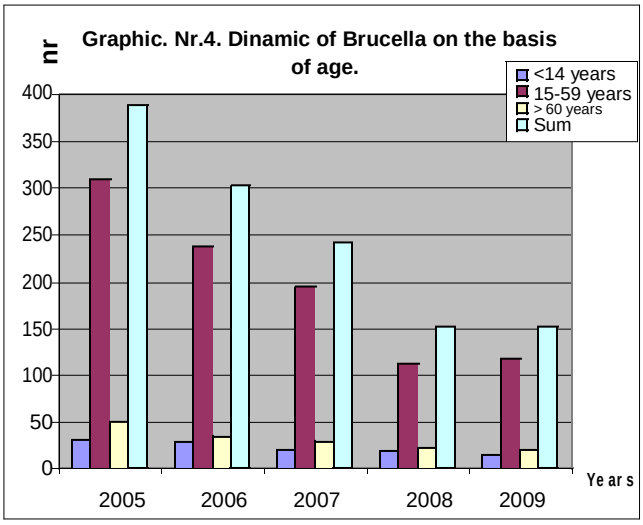
All the studied cases (1236) are analyzed in a detailed way, in order to determine their ratio compared with the contaminated animals, the ways of obtaining the infection, time of infection, recognition of the nature and dynamics of the spread of brucellosis.

The results show that Brucellosis has a high frequency during the spring, where the contact with the contaminated animals is greater (baby delivery, milking, slaughtering, etc.). In Chart No. 2, the critical point on having more infection is during May. The dynamics of the infection is favoured by the impact of the climatic factors.

The identified cases show that the higher rate of infection is attributed to persons who have direct contact with the contaminated animals, identified on the basis of two indicators that are the profession of the people, displayed by the settlements of the infected persons and their age (Chart No. 3,4), which shows that with the passing of the years, the percentage of the



Graphic 3. Distribution of brucella melitensis in town and village

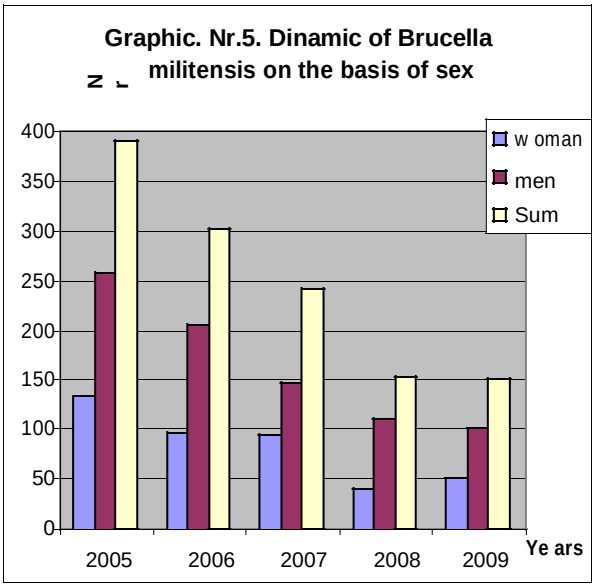


Graphic 4. Dynamics of distribution of brucellosis according to age

infected persons, being town residents is firstly increased and latter slightly decreased (according to the years in this study 13.3%, 16.9%, 20.7%, 15.8%, 14% due to the migration of infected persons in an individual way, but also the whole family from the village to the town, over the years 2006-2007), in addition to the consumption of the contaminated products by not having enough information on the epidemiology of brucellosis.

In the analysis, about 90% of the infected people living in the city are contaminated indirectly from the consumption of livestock products and by-products, the rest are people who have been directly contaminated as they exercise some professional activities such as veterinarians, dairy workers, slaughterers etc. The characteristic for such infected individuals is their random distribution by sex and age groups, which is mostly related with their taste, by having a light predominance of the male and advanced ages. (52% are male and 48% female). The infected people, who live in the villages are in a higher percentage (in years: 87.7%, 83.1%, 79.3%, 84.2% and 86%), where the main contamination factor is the direct contact with the infected animals. The changes in the frequency of the infection (± 4.6%) are related to the internal migration process from the village to the city. 7.2% of the infected persons (ds = ± 1.89) do not have any contact with the infected animals but they have used their contaminated livestock products and by-products, while 92.2% (ds = ± 0.87) have been directly contaminated.

The frequency of the dissemination of brucellosis from the source is displayed in the following age groups 9:39% (0-14 years), 78.56% (15-59 years) and 12:46% (> 60 years old) graph No. 4. Based on these data it



Graphic 5. Dynamics of distribution of brucella militensis on the basis of sex

results that the primary cause of the brucellosis infection is the direct contact with the contaminated animals (91.1%, varying from 83% in Përmet to 96% in Korca), and less from the consumption of the contaminated animal products.

The study shows that 33.66% of those infected are women and 66.34% male (chart no.5). This is related to the fact that the people of this region are breeding a great number of sheep and goats, the later are moved from winter pasture into the summer ones and vice versa and they are mainly managed by men. The women are supportive to the livestock economies, by working part time, but lately because of the development of the technology (especially in milking) the participation of women has decreased a lot, which is reflected to the frequency of the brucellosis contamination given by years (31.97%, 23.08%, 22.84%; 9. 95% and 12.16%).

DISCUSSIONS

The region chosen to carry out this study includes approximately 359,875 (environmental report) inhabitants. This is a region in which is carried out an intensive agricultural activity with about 291,700 sheep and goats. The rural population of this region constitutes 42% of the population. The ratio between the total number of the population and the number of those infected with brucellosis reaches an average annual figure of 247.2 cases or 68.69 cases per 100 000 inhabitants, which is about 10-12 times higher than some Mediterranean regions (Spain). This requires stringent veterinary and hygienic sanitation measures to minimize the epidemic in the region. At the same time, there is a need to carry out the identification and assessment of each case, i.e. the source causing the infection by taking timely measures to eliminate its sources. From the cases undertaken for examination in this study, it results that the main source of infection are the contaminated animals as a result of the development of the livestock out of the veterinary control and from the non elimination of the infected animals. Another important factor is the manipulation with the infected organisms and products and their consumption by the local people and nationwide, expanding this way the area of the spread of brucellosis. In order to minimize the infection with brucellosis it is required full information about the causes, conditions of development, the ways of its transmission and also the preventive measures. The evolution of the brucellosis in the region shows that while in the '90s there was no case of infection, in the years 1991-1995 there were 10 cases, in the years 1995-2005 nearly 5523 cases and during the study period 1236 cases, which is estimated to be 17.3% of total infection frequency in the country.

The study shows that compared with the period 1995-2005, there is a tendency of decrease of the infection determined by: the policies of livestock farming, the impact of state institutions in the livestock farming, the increase of veterinary control but also the hygiene and sanitation measures, subvention policies for the elimination of the infected animals and the training of the population on the ways and prophylaxis towards this disease.

At a time that the number of the infected women has the tendency to be reduced, still there is a disturbing

fact that in 2009 there was a tendency of increase of the brucellosis infection to men, being an indicator of the re-activation possibilities of the brucellosis not only to the population, subject of this study but also to the rest of the population, because of the trading activities of the livestock products and byproducts within the region, outside it and abroad is performed by men.

The prevalence of brucellosis shows not only its behavior as an professional illness but also being massive disease, as the region's population is characterized by intensive migration processes within and outside the country.

RECOMMENDATIONS

After the completion of the study, it is concluded that there are identified the potential sources of the brucellosis infection. The precautionary measures to eliminate any possible spread of the infection are:

To coordinate the work of the medical and veterinary institutions, in order:

To prevent

To diagnose

and to treat on time the disease.

To withdraw from the market of all the contaminated livestock products and sub-products

To eliminate the infected animals.

To programme the livestock vaccination.

To promote the health activities among farmers, producers and consumers

To put into life the measures that will improve the communication and exchange of information between the hygiene-sanitary services and the veterinary service.

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