

Advanced Studies in Biology, Vol. 7, 2015, no. 11, 433 - 439
HIKARI Ltd, www.m-hikari.com
<http://dx.doi.org/10.12988/asb.2015.51041>

Examination of the Prevalence of Pneumonia Caused by *Pasteurella Multocida* in Calves Referred to Slaughterhouse of Borujen City

Yaser Karimi Faradonbeh¹, Morvarid Karimi Faradonbeh²,
Azarnush Karimi Dastgerdi³ and Azam Malekmohammadi³

¹Graduated of Veterinary Medicine Faculty, Shahrekord Branch
Islamic Azad University, Shahrekord, Iran

² Student of Veterinary Medicine Faculty, Shahrekord Branch
Shahrekord University, Shahrekord, Iran

³ Graduated of Veterinary Medicine Faculty, Shahrekord Branch
Shahrekord University, Shahrekord, Iran

Copyright © 2015 Yaser Karimi Faradonbeh et al. This article is distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

In this study which has been done for 4 seasons from March 2014 to April 2015. We have taken sample from the lung tissue's through the 552 calves which has been sent to the slaughterhouse. At first (before we entering the slaughterhouse) there's a questionnaire has been planned which include items like sex, living place, the animal bed at parturition time and also we test the animals through checking their heartbeats, respiratory system and observing the secretions of the eyes and the nose. According to the low economical value of the lung, especially in the large animal, we have sent the Anterior and ventral lobe and Lymph nodes of the upper part of respiratory system by the slaughterhouse personnel's cooperation to the lab for the further studying and passing pathology test. Spss 19 & Excel were the software tools which we evaluate information via them and the results was: The most infection times to *Pasteurella multocida* were reported in winter and by the way we can see a meaningful link among seasons. Also infection was higher in the cases where the animals were kept in the close environments and finally the most lesions were related to Bronchopneumonia and the less to Suppurative pneumonia.

Keywords: Pneumonia, *Pasteurella multocida*, Calf, Bronchopneumonia, Boroujen

1. Introduction

Pasteurella is bacteria of aerobic, gram-negative, immobile, bipolar cocobacillus, having light gray colonies, with smooth edges, with a diameter of 2.1 mm and it is sensitive to penicillin (Dabo et al., 2007; Irsik., 2007; Kuhnert et al., 2008). *Pasteurella multocida* has been classified into three sub-types and 16 serotypes (Irsik., 2007), which is the leading cause of respiratory infections in calves and caws and it is the most common isolated factor in fever transportation. It is usually associated with one or more other factors, weakening the immune system at the first step (Anderson et al., 2009). Pasteurelosis is a contagious disease that is often found in septicemia form in caw population and as pneumonia form in sheep and goats population. The productive species of diseases in caw is often is *pasteurella multocida*, while it is *hemolytica* in sheep and goat population.

Pasteurelosis is common diseases in humans and animals in which humans are causing side effects and genital skin. Its skin form is created in contact with the beetle and its genital form is created by contact with pets such as dogs and cats (Irsik., 2007).

Pasteurella multocida causes fowl cholera in poultry, atrophic rhinitis in pig hemorrhagic septicemia in dog. For the first time, It was isolated and named by Louis Pasteur in 1880 (Pasteur., 1962). Pasteurelosis is infectious and contagious disease appears in two clinical forms:

1. Acute and fatal form associated with hemorrhagic septicemia and it is mainly created in caw, buffalo, pigs and wild ruminants. Its clinical signs include high fever, cough, respiratory crackles, severe loss of saliva, dysentery, painful swelling in the shoulder and neck and in the subcutaneous areas of the throat, chest and abdomen, which may lead to respiratory failure and death.

3. Pulmonary form of the disease that causes pneumonia problems mainly in sheep and goat. It is mainly in the non-pathogenic form in throat and nose of sheep and goat. Its clinical symptoms include fever, cough, nasal and eye discharge, diarrhea, hemorrhagic broncho-pneumonia and with pericarditis, and pulmonary lesions that is related to the anterior and ventral parts (Irsik., 2007).

The most accurate and fastest way to identify bacteria using molecular methods is the polymerase chain reaction method (Miflin et al., 2001) The best treatment for the bacteria is beta-lactam antibiotics and fluoroquinolones or tetracyclines and amoxicillin. By controlling bacterial DNA synthesis, fluoroquinolones inhibits and tetracycline by joining to S30 ribosomal bacteria, reduce and cease the activity of bacteria (Long et al., 2006).

2. Materials and methods

In the study lasted four years from March 2014 to April 2015, 552 calves referred to slaughterhouse of Borujen city were sampled from their lung tissue. At the beginning and before entering the slaughterhouse, they were examined in terms of heart rate and breathing, and discharges from their eyes and nose.

Due to the low economic value of the lungs, especially in large animals, and by cooperation of slaughterhouse personnel and by consent of livestock owners, the frontal and abdominal lobes along with lymph node of upper area of respiratory tract of animals were sent to laboratory in order to study, record, and conduct pathological studies. After sending samples to laboratory, lesions were classified in the bronchopneumonia, interstitial bronchopneumonia, Ploropneumonia, fibrin-purulent bronchopneumonia and septic pneumonia groups. In order to evaluate information, SPSS 19 and Excel 2010 were used.

Table1. Questionnaire

ra w	gender		Environment to keep livestock			Bed of livestock			Hea rt beat	respirati on	Observati on of discharge s from eyes and nose
	male	female	desert	Covered	Free-space	cement	sawdust	muck			

3. Results

Among the 552 calves referred to slaughterhouse, 496 of them were male and 56 of them were female. In average, 138 of them were studied in each season. Among the total number of slaughtered calves, 56 of them had respiratory problems, 18 of them were female and 38 of them were male.

Pasteurella multocida infection was reported at highest level in winter that can observe a significant relationship between seasons. In addition, in cases that live-

stock were kept in closed environment, infection was higher. The greatest lesions were related to bronchopneumonia and the least lesions were related to septic pneumonia. The results are as follows:

Table 2. The frequency of infection with *Pasteurella multocida* based on gender

	Infected male calf	Infected female calf
frequency	38	18
Percentage of frequency	67/85	32/15

Table 3. Frequency of *Pasteurella multocida* infections during the seasons of year

	spring	summer	fall	winter
frequency	15	4	8	29
Percentage of frequency	26/79	7/14	14/28	51/79

There are significant association between the different seasons and disease caused by *Pasteurella multocida* ($P < 0/05$).

Table 4. The place to keep livestock during breeding

	Desert (grazing)	Covered livestock	Covered livestock with free space
frequency	8	19	29
Percentage of frequency	14/28	33/93	51/79

There are significant association between the location breeding animal and disease caused by *Pasteurella multocida* ($P < 0/05$).

Table 5. The bed of livestock in the initial weeks of birth

	cement	Sawdust	muck
frequency	12	16	28
Percentage of frequency	21/43	28/57	50

There are no significant association between the litter breeding animal and disease caused by *Pasteurella multocida* ($P < 0/05$).

Table 6. The type of lesion in the lung

	Bronchopneumonia	Interstitial bronchopneumonia	Septic pneumonia	Ploropneumonia	Fibrin-septic bronchopneumonia
frequency	19	12	2	14	9
Percentage of frequency	33/93	21/43	3/57	25	16/07

In our study found that the dominant lesion bronchopneumonia and lowest lesion related to suppurative pneumonia.

4. Discussion

According to a study conducted by Karim Khani et al in Urmia, it was revealed that race, sex, age, and season have direct impact on incidence of pneumonic pasteurellosis, and it was found that the highest involvement related to hybrid race of buffalo in winter and Holstein race in the spring (Karim Khani et al., 2011). too in our study found that the highest involvement related to winter.

In a study that was conducted in Mashhad by Mohammadi et al, it was found that the most common cause of pneumonia in calves is *Pasteurella multocida*. It was also found that *Pasteurella multocida* is sensitive to antibiotics such as Florfenicol and Cephalotin (Mohammadi et al., 2006).

During the investigation of Garly et al carried out in 1989, among the 13 died calves, it was revealed that the main cause of pneumonia is *Pasteurella multocida* in all cases. The dominant lesion in this disease is fibrin bronchopneumonia. too in our study found that the dominant lesion in this disease is bronchopneumonia.

In a study conducted by Sayari et al on 1622 lung in slaughterhouse, it was found that the greatest lung lesion related to interstitial pneumonia, with 61 percent, while the lowest lesion related to Suppurative bronchopneumonia, with 7/2 percent. In addition, in the bacteria cultivation, other factors were also isolated such as staphylococcus aureus, *Pseudomonas cheosis*, acinetobacter species, *Arcanobacterium pyogenes*, *Escherichia coli* and *Proteus* (Gourlay et al., 1989). but in our study found that the dominant lesion bronchopneumonia and lowest lesion related to suppurative pneumonia.

Finally, during investigations conducted by Azi et al on 12168 slaughtered sheep and goats the slaughterhouse of Ziaran, 282 lungs were taken. Then, in the research and diagnosis animal disease, suspicious samples were divided into two parts, one part of them was sent to Bacteriology Department and the other part was sent to the Pathology Department to interpret lesions.

In the pathological cuts, the percentage of lesions was as follows: bronchopneumonia, interstitial bronchopneumonia, septic bronchitis, Ploropneummonia, septic fibrin bronchopneumonia fibrin, and developed pneumonia were diagnosed as 0/51, 0/17, 0/12, 0/07, 0/04, 0/09, and 0/01, respectively. The obtained statistical information also indicated that the frequency of *Pasteurella* is significant among seasons (Azi et al., 2007). But according to our study lowest lesion related to suppurative pneumonia

References

- [1] A. Azi, S. Moradi, A. Jabbari, Investigation of pneumonic prevalence resulting from pasteurellosis in sheep and goats slaughtered in Ziaran Slaughterhouse, *Razi Archives*, **62** (2007), no. 4, 239-235.
- [2] D.E. Anderson, M.D. Rings, *Current Veterinary Therapy 5th Edition*, Food Animal Practice, W.B. Saunders, St. Louis, 2009, MO: 164-170.
- [3] E. Karimkhani, M. Zahraesalehi, M. Sadeghizali, M. Karimkhani, R. Lamei, *Pasteurella multocida* isolation from slaughtered caws and buffalos in the industrial slaughterhouse of Urmia, *Razi Archive*, **66** (2011), no. 1, 41-39.
- [4] Gh. Mohammadi, K. Qazvini, H. Abbas Panah, Antimicrobial susceptibility testing of *Pasteurella multocida* and *Mannheimia haemolytica* and *pasteurella multocida* isolated from calves infected with pneumonia diseases, *Razi Archive*, **61** (2006), no. 2, 96-91.

- [5] J.K. Mifflin, P.J. Balckall, Development of a 23 SrRNA-based PCR assay for the identification of *Pasteurella multocida*, *Lett. Appl. Microbiol.*, **33** (2001), 216-221. <http://dx.doi.org/10.1046/j.1472-765x.2001.00985.x>
- [6] L. Pasteur, *The Attenuation of the Causal Agent of Fowl Cholera*, Grosset and Dunlap Inc, 1962, 145-172.
- [7] M. Sayari, Pathological and bacteriological examination of lobe lungs lesions in buffalo, *Journal of Animal Medicine*, **5** (2011), no. 2, 128-125.
- [8] M.B. Irsik, *Bovine respiratory disease associated with Mannheimia Haemolytica or pastuerella multocida*, VM 163, University of Florida, 2007.
- [9] P. Kuhnert, H. Christensen, *Pasteurellaceae Biology Genomics and Molecular Aspects*, Caister Academic Press, 2008, 978-1-904455-34-9.
- [10] R.N. Goualay, L.H. Thomas, S.G. Wyld, Experimental *Pasteurella multocida* pneumonia in calves, *Res. Vet. Sci.*, **47** (1989), no. 2, 185-9.
- [11] S.M. Dabo, J. D. Taylor, A.W. Confer, *Pasteurella multocida* and bovine respiratory disease, *Anim Health Res Rev*, **8** (2007), no. 2, 129-150. <http://dx.doi.org/10.1017/s1466252307001399>
- [12] S.S. Long, L.K. Pickering, C.J. Baker, J.A. McMillan, *Report of the Committee on Infectious Diseases*, 27th Edition, 2006, 1-58110-207-0.

Received: October 24, 2015; Published: November 24, 2015