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NEWSLETTER

8th International *Bartonella* Meeting, Beijing, China©

Evelyn E. Zuckerman, Editor **Fall 2017** **Vol. 16, Number 4**

In This Issue:

Once again, we attended the International *Bartonella* Meeting, the 8th in Beijing, China. Dr. Hardy has attended all 8 meetings and has presented papers at all but the first meeting in Germany in 1999. We found ourselves on a 15-hour-non-stop polar flight home after spending 2 weeks in China. Of course, we visited the pandas, the terracotta warriors, the 3,915-mile Yangtze River and Shanghai. The Chinese cities and the country were most impressive. In this Fall, 2017 NVL Newsletter, we will review the *Bartonella* meeting and China.

8th International *Bartonella* Meeting:

The title of the meeting was the 8th International Conference on *Bartonella* Emerging Pathogens and was organized by the National Institute for Communicable Disease Control and Prevention, State Key Laboratory of Infectious Disease Prevention and Control, and the Chinese Center for Disease Control and Prevention (China CDC). The conference was opened by Professor Zhang Jianzhong, the Deputy Director of the National Institute for Communicable Disease Control and Prevention, China CDC.

Professor Zhang Jianzhong, China CDC, Photo by Dr. Hardy©

The keynote speech was given by Jane E Koehler, entitled:

Anatomy of a *Bartonella* Research Career: from Clinical Bacillary Angiomatosis to Molecular Signal Transduction. Koehler, J.E. et al. University of Calif., San Francisco, CA.

Dr. Koehler has been a physician pioneer in human clinical *Bartonella* and the molecular aspects of *Bartonella* and, unfortunately, she has retired. Her clinical and molecular expertise will be greatly missed.

There were only four attendees at this meeting who were also present at the first international meeting in 1999. They were Christoph Dehio, who organized the first international meeting in Germany, Jane Koehler, Bruno Chomel, and William Hardy. In general, this meeting was smaller than the previous 7 meetings with fewer Americans and Europeans in attendance. There were only a few papers on feline *Bartonella* as most of the papers were on other species of *Bartonella* and the molecular aspects of this group of pathogens. There was no presentation about cat or dog *Bartonella* in China, even though China has high populations of both species. I will summarize a few papers that are of interest for practicing veterinarians.

Participants- 8th International *Bartonella* Meeting, October 10-13, 2017 Beijing, China. Meeting Photo

Participants- 1st International *Bartonella* Meeting. March 5-8, 1999 Tubingen, Germany, Meeting Photo

***Bartonella* and Bites: Myth or Reality**.

Bruno B. Chomel, et. al. School of Veterinary Medicine, Univ. California, Davis, CA.

This study investigated the possible transmission of *Bartonella* by animal or flea bites. There have been some reports of cat scratch disease (CSD) transmitted by cat, dog and flea bites. Two studies found no association between antibodies in cats to *Bartonella* and FIV and thus conclude that oral transmission is not a major mode of *Bartonella* transmission in cats since fleas do not seem to be a vector for FIV in cats. We have also found a similar lack of association but still feel that occasional oral transmission is possible since *Bartonella* DNA has been found in the oral cavities of infected cats.[1] This group also found no transmission of the *Bartonella* species found in vampire bats to the livestock that they routinely prey upon for blood meals. The observations in cats and vampire bats leads this group to the conclusion that "*Bartonella* species are uncommonly transmitted via animal or flea bites."

Comparison of Antibiotic Therapies for *Bartonella* Infected Cats. William D. Hardy, Jr. and Evelyn E. Zuckerman. National Veterinary Laboratory, Inc. Franklin Lakes, NJ.

Since the inception of our *Bartonella* test service in 1999, we have tested 399,087 cats and found 208,722 cats (52,3%) were seropositive- 37.1% healthy and 56.0% inflammatory diseases. 27,525 cats were treated by practicing veterinarians with various antibiotics- singularly or in combinations (azithromycin, doxycycline, rifampin, pradofloxacin, marbofloxacin, orbifloxacin, and enrofloxacin) and evaluated for elimination of infection by a WB therapy titration test (TTT) for detection of antibody titer decreases, 6 months or longer, after the end of therapy. A 2-fold or greater titer decrease indicates elimination of *Bartonella* infection. 23 control, non-treated *Bartonella*-infected cats, were also evaluated by the TTT.

Results: 23 non-treated control cats, that were directly observed by our laboratory for 3 years, did not have a decrease in antibody titers. Treated Cats: **Sole Antibiotics**- n=number treated and % decrease in antibody titers: azithromycin n=18,939 90.0%, doxycycline n=714 85.7%, rifampin n=1,153 90.3%, pradofloxacin n=68 83.8%, marbofloxacin n=25 88.0%, orbifloxacin n=34 67.6%, enrofloxacin n=95 73.7%. **Antibiotic Combinations**: azithromycin & enrofloxacin n=15 87%, pradofloxacin & doxycycline n=11 90.9%, pradofloxacin & azithromycin n=6 66.7%.

Discussion: Various antibiotics, used singularly or in combinations for extended periods, are effective in eliminating *Bartonella* infections in pet cats. Those cats not responding in the first round of therapy are usually cleared of their infections with a subsequent round of therapy, with a different antibiotic. Due to the zoonotic potential of feline *Bartonella*, veterinarians should stress caution when treating infected cats and immunocompromised owners should not administer the therapy.

Role of Antibodies in Clearing *Bartonella* Bacteremia. Lena K. Siewert, Daniel D. Pinschewer and Christoph Dehio, University of Basel, Basel, Switzerland.

Antibodies can clear *Bartonella* infection in murine models. Comparing the clearing kinetics of the bacteremia between wild-type and knock-out mice showed that class switch towards IgG, opsonization and complement activation are neglectable for the clearance of *Bartonella* from the blood. These observations show that antibodies may mainly act by neutralization of vital bacterial interactions with

the host as a key step to clearing the infection. Cats infected with *Bartonella* produced very high titers of antibody against *Bartonella*, however these antibodies do not appear to clear the infection in most cats and they do not protect against reinfection.

Worldwide Cat and Dog Populations:

During the past year we travelled to the 2 most populous countries on earth and tried to take an informal census of the cat and dog populations. In India last year, we saw very few pet or stray cats whereas there were enormous numbers of stray dogs roaming everywhere in the country. Unvaccinated stray dogs are the reason India has the highest yearly number of human deaths from rabies. This year in China, we did not see many stray cats or dogs but, as is evident in the table below, China has the second most pet cats and the third most pet dogs in the world. In a PubMed search, we found only one paper on the prevalence of *Bartonella* in Chinese cats.[2] They tested only 315 pet and 46 stray cats blood samples, from throughout China, by culture and PCR, and found only 12.7% infected. No serological testing was done. They did not find a higher prevalence in warmer regions of China, unlike all other worldwide epidemiological studies. We feel the true prevalence is higher and further studies are needed. In contrast, several studies found serologic evidence of a higher prevalence in humans- 9.6-19.6% than in cats.[3]

A rare sick stray cat with URI, ear mites, fleas, and emaciation in China, Photo by Dr. Hardy©

Top 10 Populations (Millions) of Cats and Dogs, Worldwide

Cats		Dogs	
Country	**Millions**	**Country**	**Millions**
USA	74.1	USA	69.9
China	53.1	Brazil	35.8
Russia	17.8	China	27.4
Brazil	12.5	Russia	12.5
France	11.5	Japan	12.0
Germany	8.2	Philippines	11.6
UK	8.0	India	10.2
Italy	7.4	Argentina	9.2
Ukraine	7.4	UK	9.0
Japan	7.3	France	7.6

Source: wwwpetsecure.com.au
Nature Supplement Vol. 543 No 7647 Bayer Animal Health GmbH, March 30, 2017.

Top 3 Countries- Human Population 11/11/2017

Country	City	Population
China		1,409,839,399
	Shanghai	23,315,474
	Beijing	11,716,620
India		1,340,213,267
	Mumbai	12,691,836
	Delhi	10,927,986
USA		324,921,845
	New York City	8,175,133
	Los Angeles	3,792,621

Source: World Population Review

China:

After the meeting, we spent 10 days touring China and were greatly impressed with the extent of development of their enormous cities and infrastructures (bridges, railroads and highways). We saw dozens of new bridges and thousands of new 20 plus story buildings in every city.

High-rise building everywhere, Photo by Dr. Hardy©

Shanghai- Vibrant and largest city in China, Photo by Dr. Hardy©

China's population is the largest in the world with 1.41 billion as of 11/11/17. Their largest city, Shanghai, has 23 million people and the second largest, Beijing, has 12 million, larger than the largest city in the USA- New York City with 8.2 million people. In this regard, the current November 13, 2017 issue of Time Magazine, has 2 stories of the rise and dominance of present day China- Advantage China by Ian Bremmer and The New Silk Road by Charlie Campbell. One story about their economy and country-wide building and the other about the re-establishment of the Silk Road for trade and political reasons. We noted that all the city streets and highways were immaculate with no litter at all.

Of course, we visited all of China's cultural sites: The Great Wall, the Terra Cotta Warriors, the Temple of Heaven, Tiananmen Square, the Forbidden City, the pandas, the bullet train, the Three Gorges and Dam (which relocated 1.25 million people in order to build the dam), a Yangtze River cruise, and wonderful Shanghai.

The following photographs, by Dr. Hardy and Evelyn Zuckerman, show these sites.

The Great Wall

The Terra Cota Warriors

Temple of Heaven

Tiananmen Square

Panda

Red Panda

One of the Three Gorges on the Yangtze River

Three Gorges Dam on the 3,915-mile Yangtze River

An Illuminated Bridge on the Yangtze River

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