

LEPTOSPIRE INFECTION IN SWINE OF THE RIBEIRÃO PRETO REGION, BRAZIL

INFECÇÃO LEPTOSPÍRICA EM SUÍNOS DA REGIÃO DE RIBEIRÃO PRETO, BRASIL

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ABSTRACT

Sera of 262 swines from six townships in the Ribeirão Preto region, Brazil, were examined by rapid microagglutinations test for leptospire. Two hundred and twenty six sera were collected from sows, 16 from boars and 20 slaughtered animals. The results showed that 13.71 % of the sows, 18.75% of the boars and 20.00% of the slaughtered swine were positive. The highest were found in two positive sera for serotypes pyrogenes and javanica in the dilution 1 : 1.600. Statistical analysis showed that the breed, sex and breeding phase did not significantly affect frequency of leptospire infection in swine.

Key-words: Leptospire - swine.

1. - INTRODUCTION

Leptospirosis is known to be one of the most important and probably the most prevalent of zoonoses (WORLD HEALTH ORGANIZATION^{1 5}). Among domestic animals, swine greatly contribute to the spreading of leptospire among animals and humans (MICHUA & CAMPBELL¹⁰).

In Brazil, serologic surveys have shown that the frequency of leptospirosis among swine varies between 5.29 and 82.4% in different regions, and that the most frequent serotypes also vary (SANTA ROSA et alii^{1 3}; REIS et alii^{1 1}; SANTA ROSA et alii^{1 4}; CORDEIRO et alii³; ÁVILA et alii²). Similar surveys have been carried out in other countries (McERLEAN⁹; HARRINGTON Jr.⁵; HIGGINS & CAYOVETTE⁶; JENKINS et alii⁸; HIGGINS et alii⁷).

The objective of the present investigation, carried out in the Ribeirão Preto region on swine of reproductive age or slaughtered in abattoirs, was to study the frequency of leptospirosis on the basis of breed, sex and breeding phase of the animals.

2. - MATERIAL AND METHODS

A total of 262 blood samples were collected from swine from six townships in the Ribeirão Preto region. Twenty of these samples were obtained from animals slaughtered in an abattoir, and the remainder from swine belonging to

different farms.

A card was filled out for each animal with data concerning breed, sex, breeding phase and any clinical symptoms detected. Additional data on breeding system, feeding, vaccinations and other animal species present, rodents in particular, were obtained from the management of each farm.

Sera were centrifuged at 1500 rpm for 15 minutes, placed in 10 ml sterilized flasks and stored frozen at -20°C until the time for use. The sera were titrated by the rapid microagglutination test of RYU^{1 2}, using live leptospire cultures of the following serotypes: *andamana*, *australis*, *autumnalis*, *ballum*, *bataviae*, *brasiliensis*, *canicola*, *whitcombi*, *butembo*, *grippotyphosa*, *wolffi*, *icterohaemorrhagiae*, *javanica*, *panama*, *pomona*, *pyrogenes*, *shermani*, and *tarassovi*. The cultures had been incubated 4 to 14 days at 28°C.

The results were analysed by the chi-square (X²) test and the following characteristics were analyzed: breeding phase, sex, and breed.

3. - RESULTS

As shown in Table I, examination of 262 serum samples from six different townships in the Ribeirão Preto region by the fast microagglutination test showed 38 (14,5%) positive reactions for one or more leptospire serotype.

Table II shows the frequency of sera with positive reac-

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tion to the serotype used and the results of the determination of the titer for each serum.

It can be seen in Table III that of the 262 pigs examined, 226 were dams of reproductive age, 16 were sires, and 20 animals slaughtered at an abattoir, with respective percentages of leptospire infection of 13.7, 18.75 and 20.00%.

The number and percentage of sera reacting positively to the fast microagglutination tests for leptospire, by breed and sex, are shown in Tables IV and V, respectively.

According to the results given in Tables III, IV and V, the X^2 values calculated for breeding phase, breed and sex were 0.8226, 1.4058 and 0.4482, respectively, indicating no significant differences between variables, since they did not exceed the critical X^2 values for the rejection level tabulated for 0.05, with 2, 3, and 1 degree of freedom, respectively.

4. - DISCUSSION

The frequency of agglutinins among 262 pigs from six different townships in the Ribeirão Preto region, State of São Paulo, was 14.50%. Table I shows that, among the six townships studied, only Patrocínio Paulista had no positively reacting swine. We should remember, however, that the number of sera from this township was small. This could also be the reason why the Sertãozinho township showed the highest percentage of positively reacting animals.

The *javanica* and *pyrogenes* serotypes showed the highest percentages of positive reactions (Table II). Even

though they are not normally considered important in the epidemiology of swine leptospirosis, they are sometimes encountered during serologic surveys (ALSTON & BROMM¹ SANTA ROSA et alii⁴).

Serotype *andamana*, the third most frequent in the present survey, is considered apathogenic by most authors. Cases of leptospirosis caused by this serotype, however, have been reported among sewer workers (CORREA et alii⁴). It should be pointed out that the swines studied in the present investigation exhibited no clinical sign of infection, but may have represented sources of infection for handlers and slaughterers.

The *pomona* serotype has been frequently reported in serologic surveys of leptospire infection in swine. The 1.52% index in the present investigation, although relatively low, permits us to confirm its importance since this serotype has already been isolated in outbreaks of abortion among swine of the States of São Paulo (SANTA ROSA et alii³) and of Santa Catarina (SANTA ROSA et alii⁴).

The report by McERLEAN⁹ that the frequency of anti-leptospire antibodies increases with age was contradicted by the present results, since the positivity rate encountered among dams and sires was not statistically different from that encountered among slaughtered swine, whose ages did not exceed one year.

On the basis of these results, we may conclude that breed, sex and breeding phase do not significantly affect that frequency of leptospire infection among swine.

TABLE I - Frequency of positive reactions in 262 swim sera tested by rapid microagglutination for leptospire, in each of six different townships in the Ribeirão Preto region, State of São Paulo, in 1981/1982.

Township	No. of sera examined	Positive	
		No.	%
Altinópolis	83	10	12,04
Orlândia	89	09	10,11
Patrocínio Paulista	05	00	00,00
Ribeirão Preto	25	06	24,00
Serrana	55	11	20,00
Sertãozinho	05	02	40,00

TABLE II – Percentage and final titers in 262 sera of swine from the Ribeirão Preto region, State of São Paulo, that reacted positively to the rapid microagglutination test for leptospire.

Serotype	Positive		1:100	1:200	Titer		
	No.	%			1:400	1:800	1:1600
<i>Andamana</i>	06	2.29	3	2	1	—	—
<i>Butembo</i>	04	1.52	—	1	3	—	—
<i>Icterohaemorrhagiae</i>	03	1.14	3	—	—	—	—
<i>Javanica</i>	13	4.96	5	4	1	2	1
<i>Panama</i>	04	1.52	—	4	—	—	—
<i>Pomona</i>	04	1.52	2	1	1	—	—
<i>Pyrogens</i>	11	4.19	5	3	—	2	1
<i>Shermani</i>	01	0.38	—	—	—	1	—

TABLE III – Number and percentage of sera reacting positively to rapid microagglutination for leptospire in 262 swines from the Ribeirão Preto region, State of São Paulo, at different breeding phases.

Breeding phase	No. of sera examined	Positive	
		No.	%
Dams	226	31	13.71
Sires	16	03	18.75
Slaughtered	20	04	20.00
Total	262	38	14.50

TABLE IV – Number and percentage of sera reacting positively to rapid microagglutination for leptospire in 242 swine from different farms in the Ribeirão Preto region, State of São Paulo, by breed.

Breed	No. of sera examined	Positive	
		No.	%
Landrace	76	10	13.45
Large white	86	15	17.44
Duroc	08	01	12.50
Crossbred	72	08	11.11
Total	242	34	14.04

TABLE V – Number and percentage of sera reacting positively to rapid microagglutination for leptospire in 262 swine from the Ribeirão Preto region, State of São Paulo, by sex.

Sex	No. of sera examined	Positive	
		No.	%
Males	36	07	19.44
Females	266	31	13.71
Total	262	38	14.50

RESUMO

Em estudo epidemiológico visando determinar a frequência de infecção por leptospiros em suínos da região de Ribeirão Preto, Brasil, soros de 262 suínos de seis municípios foram examinados através do teste de microaglutinação rápida. Do total de soros examinados, 226 eram de matrizes em reprodução, 16 eram de reprodutores e 20 eram de animais abatidos em matadouros, saídos da fase de "acabamento", os quais mostraram porcentagens de 13,71%, 18,75% e 20,00% respectivamente de infecção leptospírica, fornecendo um índice global de positividade de 14,50%. Os títulos aglutinantes mais elevados foram encontrados em dois soros reagentes para os sorotipos pyrogenes e javanica na diluição de 1 : 1.600. Pela análise estatística, verificou-se que a raça, o sexo e a fase de criação não influenciam significativamente na frequência da infecção leptospírica em suínos.

Palavras-chave: *Leptospira* - suíno.

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