

STUDY OF EARLY PHENOMENA DURING EXPERIMENTAL EPIZOOTIC RABBIT ENTEROPATHY: PRELIMINARY RESULTS

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ABSTRACT

This study uses the effectiveness of the bacitracin for better knowledge of the various phases of the ERE in particular in early hours which follow the inoculation. Six groups of animals were used including 3 treatments with Bacivet S at different time: A group treated before inoculation. A group treated before inoculation but whose treatment stopped 20 hours after inoculation. A group only treated 20 hours after inoculation. An inoculated reference group and never treated. Two Uninoculated but treated reference groups. Three parameter were studied: growth, mortality and rumbling noises (borborygmus). The whole of the studied parameters is very coherent and lead to the same interpretation of the results. A significant fall of growth is observed before the 20th hour following the inoculation in all the inoculated groups. The treatment with the bacitracin allow to remove mortality and the rumbles but not this initial fall of growth. The treatment started as soon as 20 hours after inoculation is much less effective. Even with a preventive treatment stopped only 20 hours after inoculation one observes a delay of several days for the apparition of the disease (fall of growth, appearance of the rumbles) and the total mortality is reduced. Very few pathogens can explain this early fall of the growth. The bacitracin is antibiotic which make it possible to control the disease very well thus probably the pathogen but not the physiopathological disturbances of the first hours. The intervention of an exogenic toxin as soon as the moment of the contamination seems likely.

Key words: rabbit, epizootic enteropathy, bacitracine, physiopathogeny.

INTRODUCTION

The Epizootic Rabbit Enteropathy (ERE) is now systematically reproduced with an inoculum coming from the intestinal sick rabbit contents (TEC 3) (LICOIS and COUDERT, 2001). The disease is reproduced as well in laboratories facilities as under field conditions (BOISOT *et al.*, 2003). It is an over acute disease and the first symptoms

appear in the days which follow the contage. During studies of antibiotic treatment we had observed that the treatment with bacitracin (Bacivet S) allows to well control the disease (mortality, loss of growth). However the treatment did not prevent the first clinical signs

MATERIAL AND METHODS

Experimental design (Table 1)

Six groups of animals were used including 3 treatments with Bacivet S at different time:

A group treated before inoculation (*Inoc + treated from D-3 to D+10*)

A group treated before inoculation but treatment stopped 20 hours after inoculation (*Inoc + treated from D-3 to D+1*).

A group only treated 20 hours after inoculation (*Inoc + treated from D+1 to D+10*)

An inoculated reference group and never treated (*Inoculated*)

Two Uninoculated but treated reference groups. One is placed in the infected room (*Uninoculated Treated A*) and the other in a similar room but without other inoculated animals (*Uninoculated Treated B*).

Table 1: Experimental design

room		Treatments (Bacivet S)			
		No	From D-3 to D+10	From D-3 to D+1	From D+1 to D+10
A	Inoculated	7 cages	7 cages	7 cages	7 cages
A	Control	-	5 cages	-	-
B:	Control	-	5 cages	-	-

In each cages there were 4 to 5 animals: 31 animals per group when 7 cages and 22 animals when 5 cages

Animals and experimental facilities

At weaning (35 days) 168 young SPF rabbits were selected on the basis of their weight in a contemporary population of 245 young rabbits. The distribution in the treatments was made randomly in a structure in block (weight).

The cages out of metal netting are laid out of battery of 2 levels. The buildings are disinfected by gas formol before and after each experimentation. The temperature and the aeration are controlled.

Inoculation and treatments

The animals were inoculated by oral way with 0,5 ml of the inoculum referred TEC 3 in our lab. The drink water of the treated groups contained 0,7 G per litre of Bacivet S what corresponds on average to a consumption of 420 UI per kg of body weight.

Measured parameters.

Animal were weighted. at distribution in the cages (D -6), then at the beginning of the treatment (D -3) and every days starting from the inoculation (D0) during the acute period (5 days) and finally twice during the period of convalescence (D7 and D10).

Detection of the borborygmus (bowel rumbling noises) was carried out at each weighing. Mortality was noted every day and all animals were autopsied.

Statistical Analyze

The daily weight gains (DWG) were analyzed by variance analysis with 2 factors (Treatment and block), (Systat). Mortality was analyzed by the test of χ^2

RESULTS

Growth (Figure 1)

The uninoculated and inoculated control groups had the hoped evolution of growth. It is noticed that in the control group located in the contaminated room one observes a short reduction of the growth during the peak of the disease of the inoculated reference group. This is supposed to be due to a massive contamination of the room. This phenomenon is usual in all of our trials but generally appears later. For this reason we have another reference group in a not contaminated room and the uninoculated animals are treated.

The disease of the inoculated untreated group has the characteristic evolution of the ERE with an early fall of the growth followed by a peak of morbidity towards the 4th -5th day and a re-establishment starting from D10.

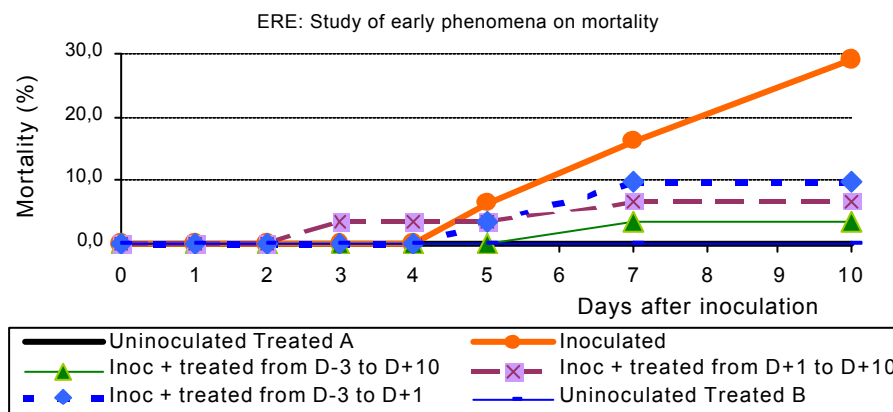


Figure 1: ERE; Study of early fall of daily weight gain

In all the inoculated groups the growth fell significantly before the 20th hour (D1) (P<0.01). This fall of growth lasted only one or two day for the treated groups and the growth became again not significantly different (P<0.20) to that of the uninoculated control group as soon as the 3rd day.

In the group treated after inoculation the early fall of growth was more significant and lasted 2 days. Later the growth remained slightly but significantly lower than in the uninoculated groups ($P < 0.05$).

In the group with stopping of the treatment from the 20th hour one did not observe an immediate effect of the stopping of the treatment. The growth remained similar to the treated group (D-3 D+10) during several days before falling significantly after the 5th day ($P < 0.01$).

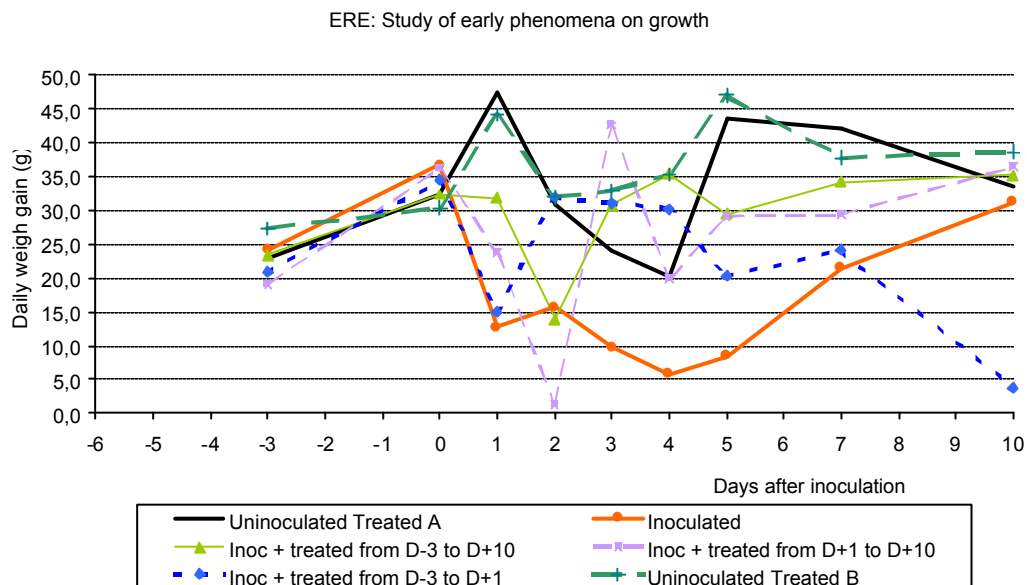


Figure 2 : ERE ; study of mortality

Mortality (Figure 2)

No mortality was observed in the two uninoculated groups. Mortality in the inoculated untreated group was 30%. It is the mortality awaited with this inoculum TEC3.

The mortality of the whole of the treated groups was significantly weaker than that of the untreated groups ($P < 0.01$).

Rumblings (Figure 3)

No water noise was heard in the uninoculated groups and in the treated group before inoculation. On the opposite it was heard as soon as D1 in all the other inoculated groups. During the first 7 days its frequency in the batch treated only from the 20th hours after inoculation was significantly more frequent than that of the groups inoculated and treated before inoculation.

The frequency of the rumblings in the batch treated only 20 hours after inoculation remained very low during the first 7 days.

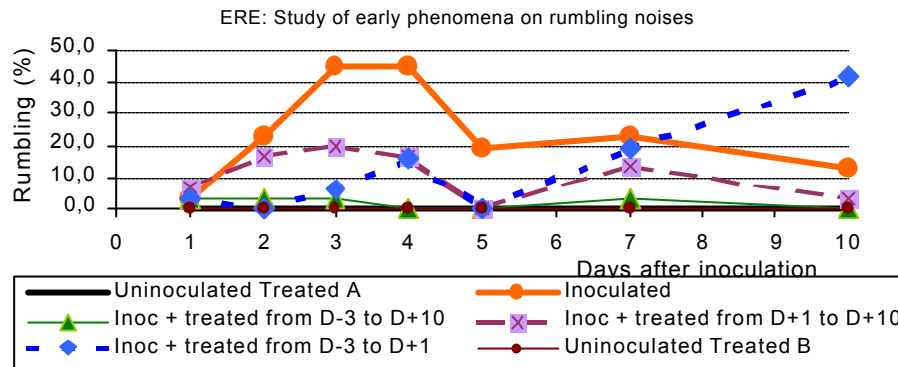


Figure 3: ERE: study of the early rumbling noises (borborygmus)

Autopsy

All the dead animals presented the typical signs of the ERE and no lesion of intercurrent pathology was seen.

DISCUSSION

The whole of the studied parameters is very coherent and lead to the same interpretation of the results.

A significant fall of growth is observed before the 20th hour following the inoculation in all the inoculated groups.

The treatment with the bacitracin allow to remove mortality and the rumblings but not the initial fall of growth.

The treatment started as soon as 20 hours after inoculation is much less effective.

Even with a preventive treatment stopped only 20 hours after inoculation one observes a delay of several days for the apparition of the disease (fall of growth, appearance of the rumblings) and the total mortality is reduced.

CONCLUSION

Very few pathogens can explain this early fall of the growth. The bacitracin is antibiotic which make it possible to control the disease very well and thus probably the pathogen but not the physiopathological disturbances of the first hours. The intervention of an exogenic toxin as suggested by MARLIER *et al.* (2003), as soon as the moment of the contamination seems likely.

In addition the consequences very differentiated from a treatment of very short duration (20 hours) or starting after the inoculation make it possible to suppose that the gravity of the disease will be in very great part conditioned by nature of the early physiopathological disturbances.

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