Universidade de Lisboa
Faculdade de Medicina
Grande Oficial da Ordem de S. Tiago de Espada

Instituto de Bioquímica

Telepathic behavior associated with biochemical and neuroendocrine parameters

Final Report

Introduction

As in previous animal telepathy experiments with rabbits realized by René-Peoc´h, and C.Saldanha [4], have shown maintenance of the erythrocyte integrity and a bradycardia effect followed by a significant decrease of plasma cortisol levels. In this project we proposed to characterize biochemical the rabbits submitted to telepathy.

Spectral analysis of heart rate variability (HRV) gives important insights into neuronal control of the heart and considerable diagnostic utility in assessing autonomic nervous system function. Another important indicator is the blood pressure variability (BVP) that also gives information about cardiovascular and respiratory autonomic control. The fast Fourier Transform is one of the important methods to obtain the low frequency (LF) and high frequency (HF), respectively parasympathic and sympathic nervous system information. The LF/HF ratio presents the independence of the sympathic and parasympathic nervous system activity.

For short time intervals is important to have a digital wavelet transforms treatment to. This way we can study the heart rate variability and blood pressure variability in rabbits. Taking into account the correlation between the results of the wavelet analysis and the real physiological evoked response we can analyze the results obtained experimentally [1, 2].

In the first part of this project we have made a characterization of the basal state of each animal and choose the best way to promote the scare for the following steps. This was the longest part of the project and the most critical one because based in this analysis we can create best model to accomplish our aim.

After these experiments and based on the wavelet analysis of the arterial plethysmography data, we observed that the blow on the rabbit's nose was the best way to promote the scare.

The studies were followed by telepathy experiments in 2 couples of rabbits with simultaneously arterial plethysmography monitorization for each pair, one scared and other not scared. Lactate and cortisol concentrations and AChE erythrocyte activity were determined after the scare in both the rabbits of the couple. Imunohistochemic analysis of rabbit hippocampus tissue sections for glucocorticoid receptors was preformed in the control and scared couples.

Faculdade de Medicina de Lisboa - Instituto de Bioquímica - Edifício Egas Moniz,
Av. Prof. Egas Moniz - 1649-028 LISBOA - PORTUGAL
Telef./Phone (351) 21 798 51 36 - Fax: (351) 21 799 94 77

Methods

The *initial characterization* for telepathy experiments was performed with 2 couples of male rabbits, a control couple (Couple A) and Scared couple (Couple B). All couples were kept together in the same cage for 3 months and received daily handling and food and water *ad libitum*. The blood flow as monitored by arterial plethysmography in order to obtain the basal line for each rabbit and the effect of the different scares.
We considered three different forms to promote the scare: with a blow, with a mobile phone tone and by dropping down a book. The different scares were spaced by 5minutes at rest.
The *telepathy experiments* were performed in 2 couples of male rabbits. The monitorization was made simultaneously in each couple of rabbits, for 5 minutes to obtain the basal lines and then a scare was preformed with a blow in the nose of the rabbit. The animals were immediately anesthetized and blood samples, from the ear vein, were collected for cortisol, lactate and AChE activity determination. Euthanasia was applied to all the animals after the blood collection and the hippocampus was isolated for the imunohistochemic assays.

Results

The graphics below show an illustration of the Wavelet analysis performed with the plethysmograph data obtained and a typical scare behavior.

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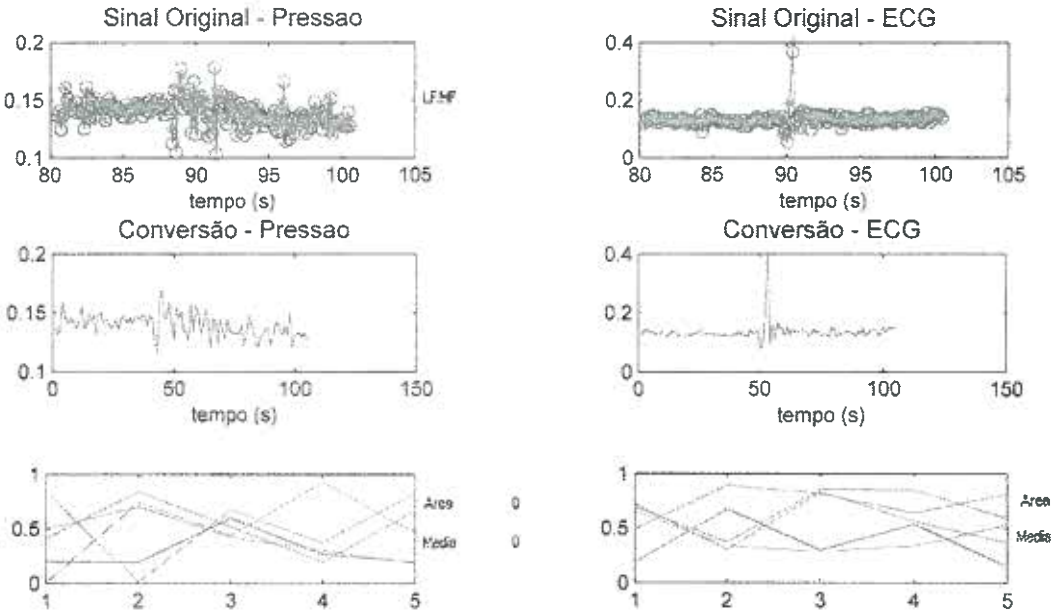

Figure 1 – Illustration of the Wavelet analysis performed.

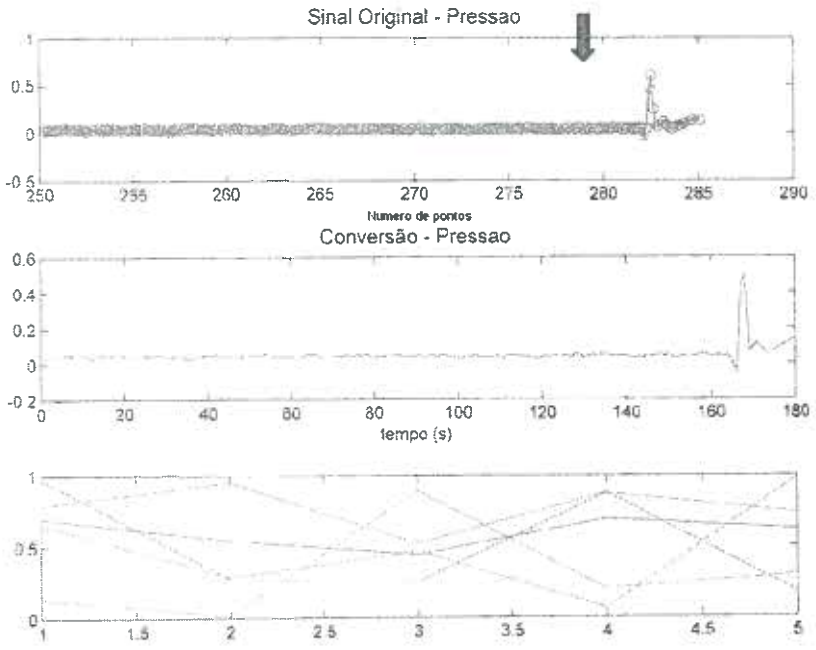

Figure 2 – Typical behavior with a scared stimulus.

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Initial characterization and scares

The analyses of the results showed that all four rabbits had different basal states and each one react differently to the same type of scare. In the wavelet analysis represented in the attached graphics (Figure 1) we can observed different LF/HF reasons for the basal states ($LF/HF_{rabbit1A}$ = 1,17 and $LF/HF_{rabbit1B}$ =1,70) of two different rabbits, as well as different LF/HF reasons for different scares given as examples in another couple of rabbits.

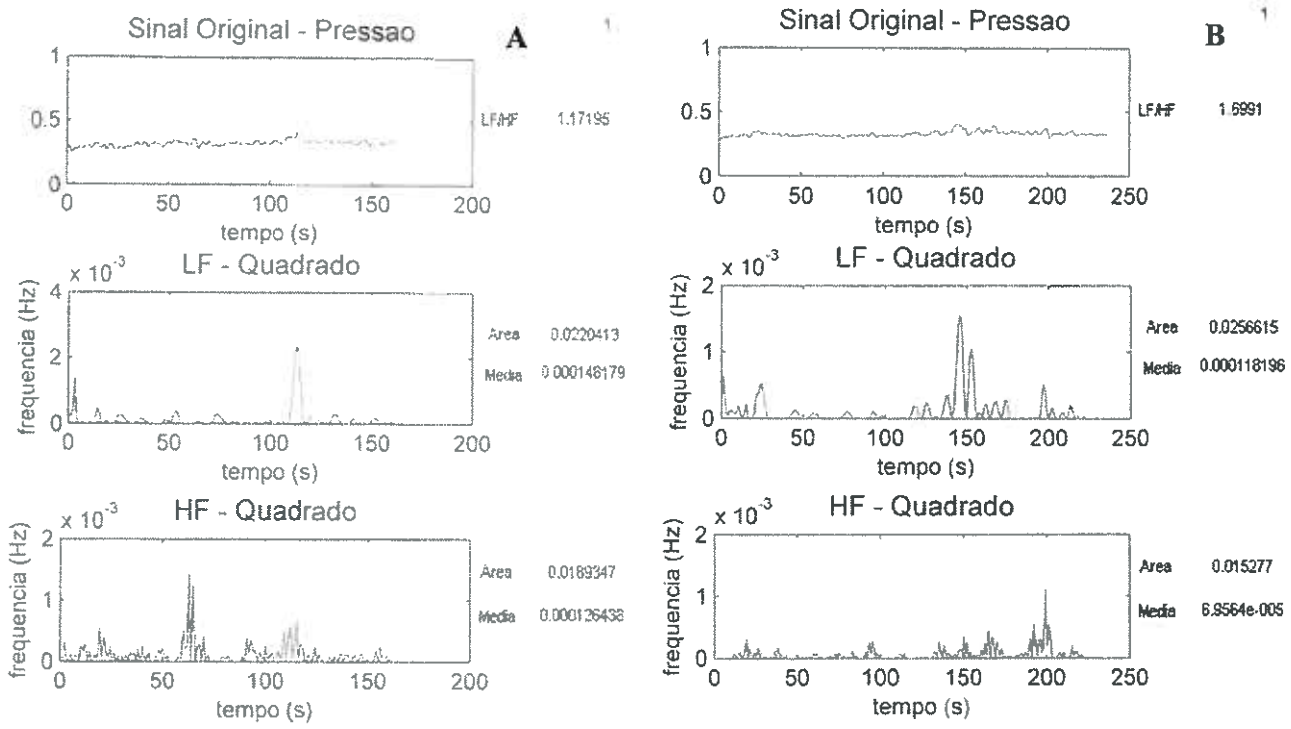

Figure 3 - Wavelet analysis of the basal arterial plethysmograph data of one rabbits of each couple A (**A**) and B (**B**).

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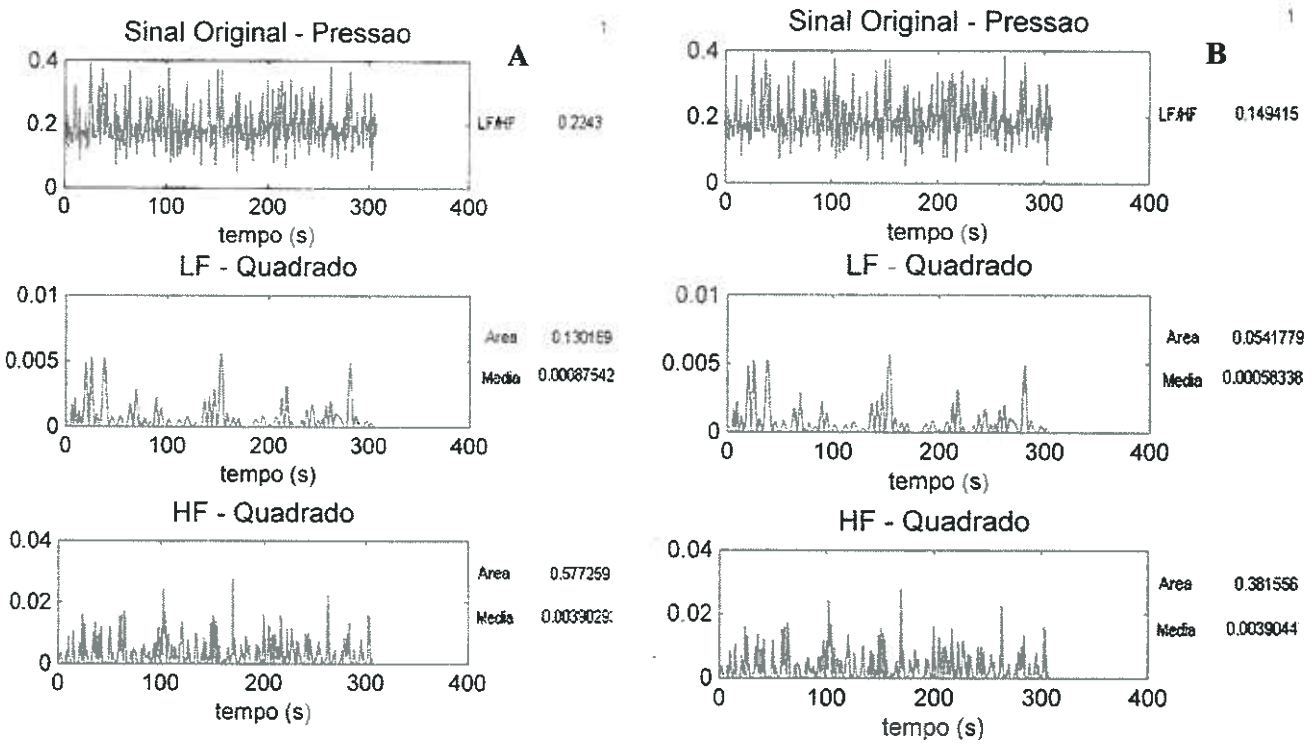

Figure 4 – Couple B wavelet analysis of arterial plethysmograph register before (**A**) and after (**B**) the mobile phone tone scare.

Two different scares were tested in couple B, for the mobile phone tone scare we obtained $LF/HF_{rabbit1}$=0,15 (Figure 4A) and for the blow on the rabbit nose $LF/HF_{rabbit1}$=0,05 (Figure 5).

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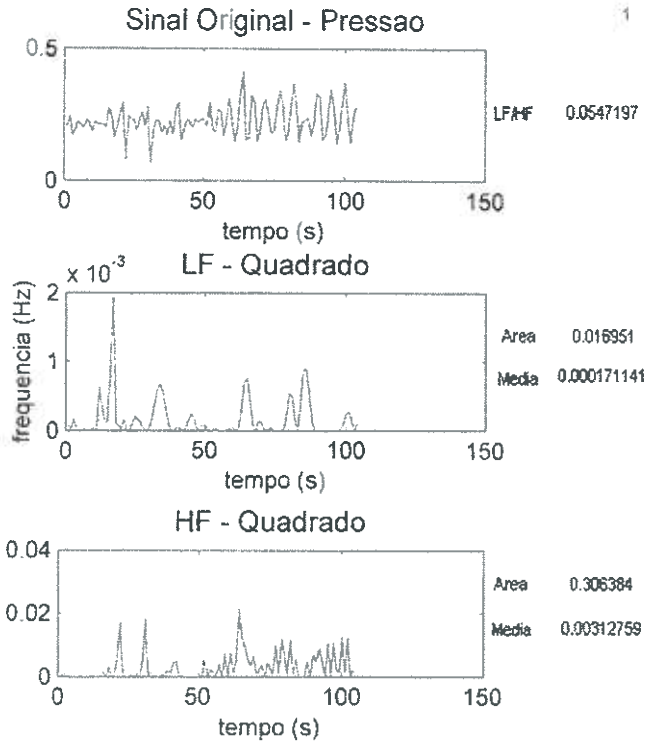

Figure 5 - Wavelet analysis of arterial plethysmograph register of rabbit 2 after a blow on the nose.

Observing the wavelet analysis obtained before the mobile phone tone scare (Figure 4A), the results show that the LF/HF reason is different from the one obtained in the basal state (Figure 3). These differences indicate that the stabilization time between the scares wasn't enough. In further experiments and basal characterizations only one scare will be applied. These results indicate that the most effective scare is to blow on the rabbit nose.

Telepathy experiments

In these experiments rabbits (scared and not scared) were submitted to the plethysmograph register, the baselines were obtained and after that the scared was performed in one of them. The wavelet analysis represented in the graphics below illustrates the results obtained immediately before and after the scare.

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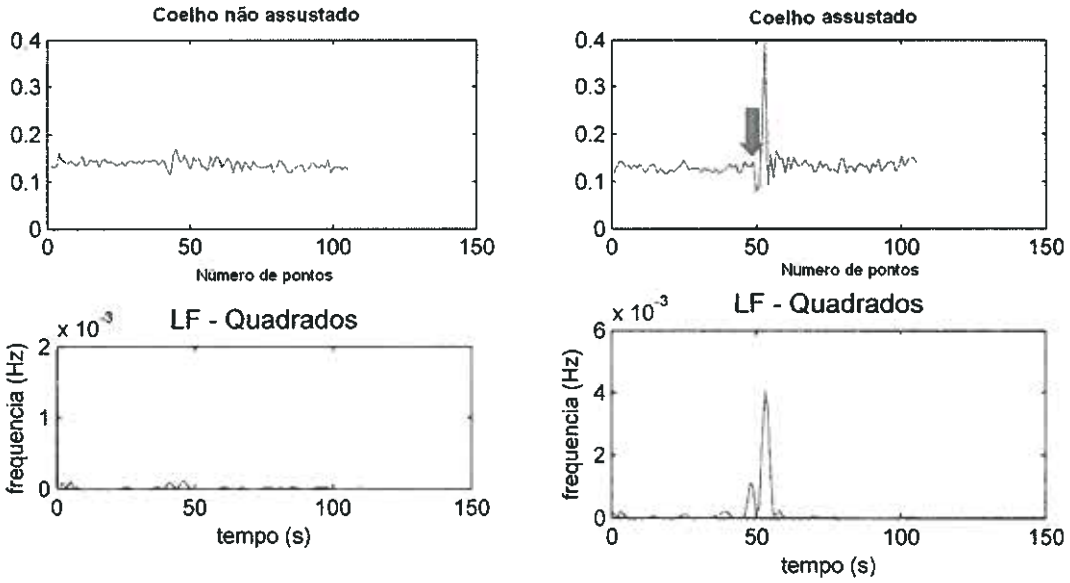

Figure 6 – Couple D wavelet analysis of arterial plethysmograph data obtained during the scare experience. The red arrow indicates the scare moment.

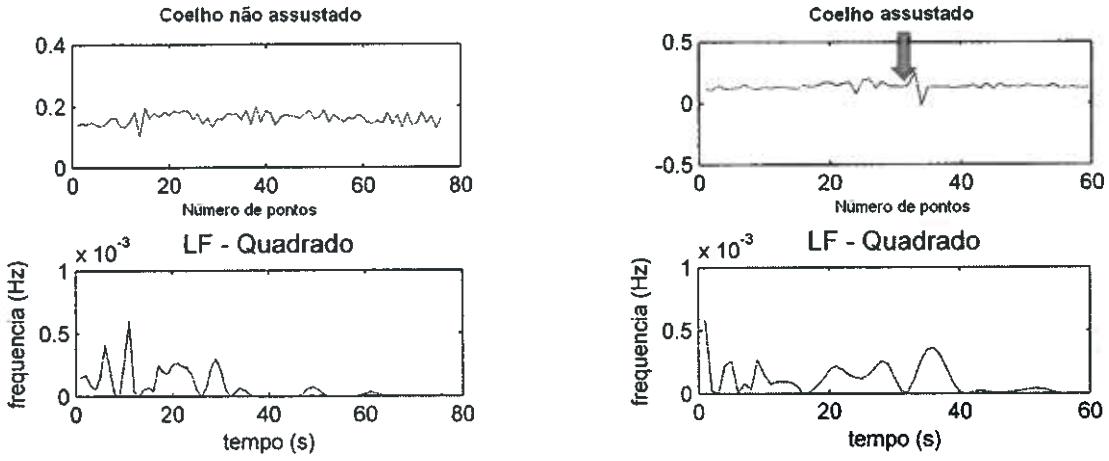

Figure 7 – Couple Cwavelet analysis of arterial plethysmograph data obtained during the scare experience. The red arrow indicates the scare moment.

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Our data shows that the chosen scare was efficient on the rabbit in which was performed but there were no changes in the registers of the respective not scared couple. The table below shows the statistical analysis performed for the LF/HF reason (data not shown) in both couples of rabbits.

Table I. Mean ± standard deviation of LF/HF reasons of the couples before and after the scare.

	Rabbits...	Means ± SD	Wilcoxon test	Paired t-test
Before Scare	Scared* (1)	7,58e-5 ± 4,89e-5		
	Not Scared#(2)	6,4e-5 ± 7,49e-5		
After Scare	Scared*(1a)	4,3e-4 ± 2,6e-4	*P<0,04	P<0,03
	Not Scared#(2a)	3,8e-5 ± 3,67e-5	#NS	#NS

The statiscal analysis shows that there weren't any differences between the scared and the not scared rabbit despite the scare was efficient.

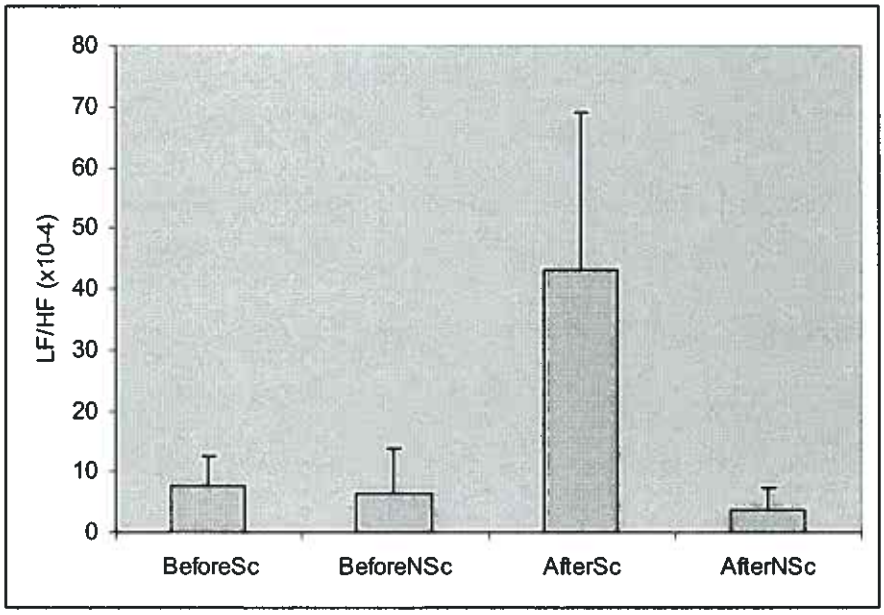

Figure 8 - This graphic show the results of the table one. In the x axis are represented the experimental groups Scared (BeforeSc) and Not Scared (BeforeNSc) before the scare and AfterSc and AfterNSc after the scare.

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TableII. Biochemical parameters determined after scare.

	Rabbits...	[Lactate] nM	[Cortisol] ng/mL	AChE (U/min/mgHb)	Paired t-test
After Scare	Scared* (1)	5,99	2,02	24	ns
	Not Scared#(2)	6,71	1,79	26	ns

There weren't any significant differences between the scared rabbit and the respective couple.

The imunohistochemic analysis of rabbit hippocampus tissue sections for glucocorticoid receptors was preformed in control (A) and scared couples (B, C, and D). Hippocampus sections of couples B, C and D showed no significant differences between the pair of the scared rabbit and the control group. Nevertheless the preformed scared was effective, as previously observed in the wavelet analysis.

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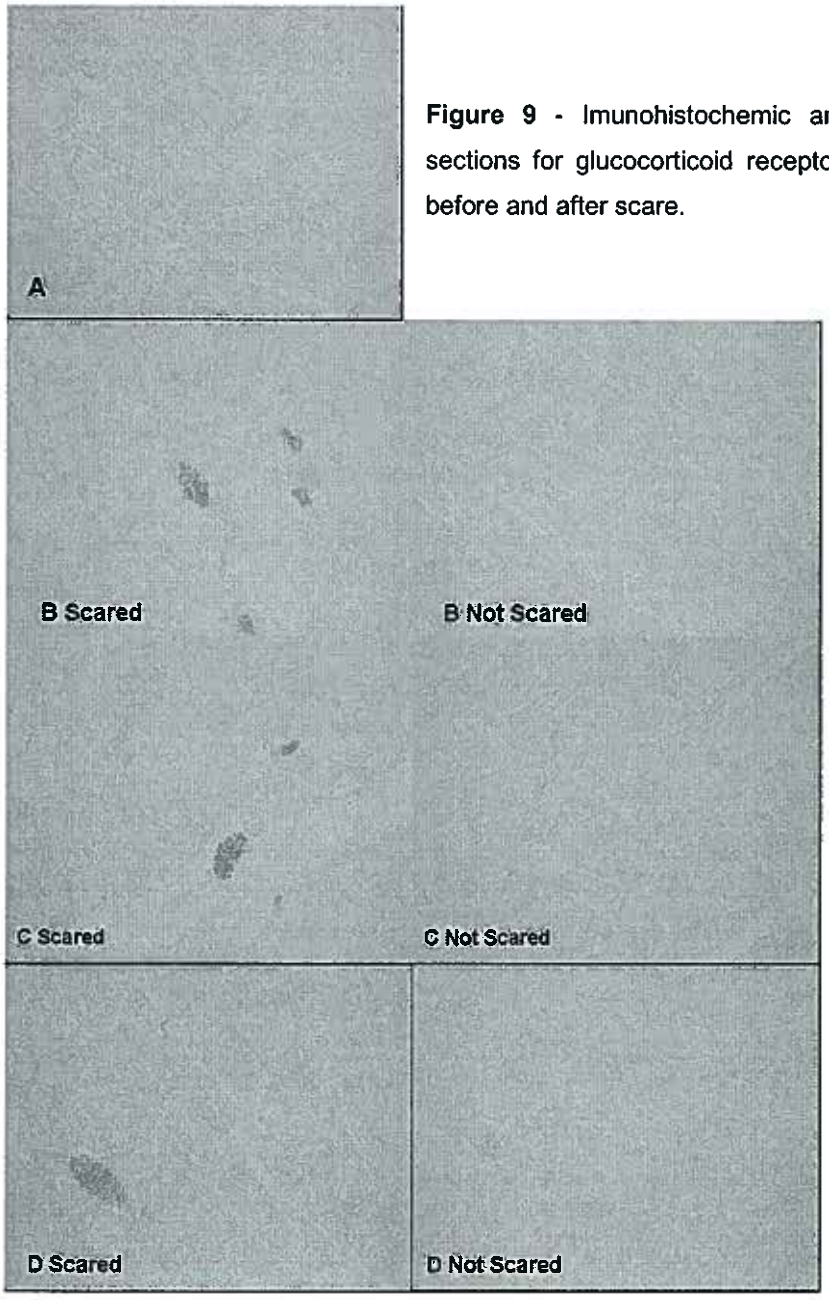

Figure 9 - Imunohistochemic analysis of rabbit hippocampus tissue sections for glucocorticoid receptors in couple A (control), B, C and D, before and after scare.

Besides the efficiency of the scare, demonstrated by the wavelet analysis, our results don't show any evidence of telepathy between rabbits that lived together for 3 months.

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