XXIV CONGRESSO BRASILEIRO DE REPRODUÇÃO ANIMAL
VIII INTERNATIONAL SYMPOSIUM ON ANIMAL BIOLOGY OF REPRODUCTION
19 a 22 de Outubro de 2021

ANGIOTENSIN-CONVERTING ENZYME INHIBITOR IN IN VITRO PRODUCTION OF BOVINE EMBRYOS

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INTRODUCTION

Enalapril is a prodrug that needs to be hydrolyzed in the liver to enalaprilat to have the angiotensin-converting enzyme (ACE) inhibitor effect. Therefore, in this study, with oocyte culture in vitro, instead of enalapril, enalaprilat, which is the active form of enalapril, was used. Enalapril was used to verify its action on the ovary of different species such as rats, rabbits, sheep and goats. There was also an increase in the number of transferable goat embryos and an improvement in their quality, in addition to an increase in the number of pregnancies and products born by embryo transfer. In the present study, we aimed to verify the influence of enalaprilat on the production of bovine embryos and on the quality of these embryos when added in maturation, fertilization and in vitro culture.

MATERIAL AND METHODS

The culture media used in the protocol for in vitro production of bovine embryos in the stages of maturation, fertilization and in vitro culture were the same and the enalaprilat was used, at different concentrations, in all stages of in vitro embryo production. In the experiment, 480 oocytes were cultured in the absence or presence of enalaprilat, in the stages of maturation, fertilization and cultivation. The CCOs were divided into four groups or treatments with 6 repetitions, with each repetition having 20 to 25 CCOs. The groups were divided according to the concentrations of enalaprilat used: control group absence of enalaprilat in all phases of IVP; enalaprilat group 1 µM; enalaprilat group 2 µM and enalaprilat group 4 µM, with the addition of enalaprilat in all stages of IVP. The quality of the structures found in D7 was assessed using the parameters established by the International Embryo Technology Society (IETS). The design was completely randomized, and the non-parametric data were evaluated by the Kruskal Wallis test at the level of 5% probability. The data were evaluated using the Sigma Stat version 3.5 program (Systat Software, Inc).

RESULTS

The influence of enalaprilat in the concentrations of 1, 2 and 4 µM added to the media of maturation, fertilization, and in vitro culture of bovine oocytes under the cleavage rate and blastocyst rate was evaluated, which did not show any significant difference between the enalaprilat treatments (Table 1 and Table 2). The results of the structures evaluated in D7 were not significant (*P* <0.05) between treatments: control (10.00 ± 1.25), 1 µM enalaprilat (11.33 ± 1.25), 2 enalaprilat µM (10.83 ± 1.25) and 4 µM Enalaprilat (8.66 ± 1.25).

Tabela 1: Cleavage rate of bovine oocytes, grown in maturation, fertilization and cultivation media added with enalaprilat.

Groups	Control	Enal. a 1 µM	Enal. a 2 µM	Enal. 4 µM
Cleavage rate	77% (103/133)	81% (103/128)	78% (106/132)	66% (80/116)

There was no significant difference at 5% probability, *P*> 0.05 by the Kruskal Wallis test.

Tabela 2: Blastocyst rate and structures found in D7 of bovine embryos, grown in medium plus enalaprilat.

Structures	Control	Enal. a 1 µM	Enal. a 2 µM	Enal. a 4 µM
Morula C.	9	5	2	2
Initial blastocyst	33	46	48	35
Blastocyst	67	40	35	23
Expanded blastocyst	3	2	4	4
Blastocyst infertilized	8	5	5	2
Blastocyst rate(%)	**76,66% (103/133)**	**68,83% (88/ 128)**	**65,9% (87/ 132)**	**53,5% (62/116)**

There was no significant difference at 5% probability, *P*> 0.05 by the Kruskal Wallis test.

CONCLUSION

It is concluded that enalaprilat did not influence the production of bovine embryos *in vitro*, but this does not elucidate the results observed in vivo and indicates the need for further study.

ACKNOWLEDGEMENTS