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MORPHOLOGICAL CLASSIFICATION OF THE OVARIES IN RELATION TO THE SUBSEQUENT OOCYTE QUALITY FOR IVF-PRODUCED BOVINE EMBRYOS

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ABSTRACT

Although some inferences have been made regarding the morphological aspects of the ovaries in relation to the subsequent oocyte developmental competence in an in vitro system, the influence of ovarian morphology, taken as a pair, has yet to be demostrated. The present study addresses this limitation. Forty pairs of ovaries from 5 morphological classes were examined to determine whether their characteristics could influence oocyte yield and developmental competence in vitro. An ovary was designated as bearing a corpus luteum (CL) with a dominant follicle (DF) a cyst (CY) or none of these structures (NO). Thus, the paired classes considered in this study consisted of 1) CL-NO 2) CL-DF 3) CL+DF-NO 4) NO-DF and 5) NO-NO. Comparisons were made among the members of 3 subgroups CL, NO and DF.

Within the CL-subgroup, the pairs of CL-NO ovaries resulted in higher ($P<0.01$) number of oocytes, cleavage rates and blastocyst formation per ovary than in the other categories (CL+DF-NO and CL-DF), with the latter being superior ($P<0.01$) to that of CL+DF-NO in terms of cleavage rates. In the NO-subgroup, NO-CL pairs yielded higher ($P<0.01$) rates of oocyte recovery and cleavage than the NO-DF pairs, and the latter was inferior ($P<0.05$) to that of NO-NO ovaries for the 2 indices. Further, blastocyst rates from the NO-CL pairs was higher ($P<0.01$) compared with those of NO-CL+DF, NO-DF, and NO-NO groups. And, in the DF-subgroup, the DF-CL pairs gave a higher ($P<0.05$) oocyte yield and cleavage rate ($P<0.01$) than the pairs of DF-NO ovaries but not significantly different in blastocyst formation. The overall oocyte recovery, cleavage and blastocyst rates for the 5 classes were, in a decreasing order CL-NO; NO-NO; CL-DF; CL+DF-NO; and DF-NO. Our results suggest that the morphological classification of ovarian pairs could be a useful means for predicting the developmental competence of oocytes in vitro, and that the presence of a dominant follicle in either one or both ovaries of a pair has a negative effect on the IVF-produced bovine embryos. © 1998 by Elsevier Science Inc.

Key words: morphology, dominant follicle, corpus luteum, estrous cycle, blastocyst

INTRODUCTION

The production of embryos by in vitro maturation (IVM), fertilization (IVF) and culture (IVC) of oocytes aspirated directly from ovarian follicles is performed for therapeutic reasons in humans, for production in domestic animals, and for experimental research in laboratory animals (25). Together with the IVF production of bovine embryos, another area of particular interest in this field is the aspiration of oocytes from a live cow by the use of ultrasound-guided equipment. The commercial value of this method over IVF lies in that it would allow breeders to produce a high number of embryos from their most valuable cows even when these animals are old, have reproductive disorders such as adhesions or blocked fallopian

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