MATURING SINGLELY VERSUS IN GROUPS ON OVINE OOCYTE MEIOSIS

PEMBELAHAN MEIOSIS SEL TELUR DOMBA YANG DIMATANGKAN SECARA TUNGGAL DAN KELOMPOK

Endang Tri Margawati
R&D Centre for Biotechnology LIPI, Jl. Raya Bogor Km. 46 Cibinong 16911 INDONESIA. Telp. (021) 8754587, Faks. (021) 8754588, e-mail : endangtrip@hotmail.com

ABSTRACT

Media Veteriner. 1998. 5(3): 7-10

The effect of maturing systems (single vs groups) of ovine oocytes was studied to examine the oocyte development in vitro. Oocytes were aspirated from follicle ovaries collected at local abattoirs Cibinong West Java, using an 18-G needle. Aspiration medium consisted of H199 + 2% FCS + 50 µg/ml Heparin and the maturating medium (IVM) consisted of B199 + 10% FCS + 10 µg/ml FSH + 10 µg/ml hCG + 1 µg/ml Estradiol. The oocytes collected were divided into three groups and treated separately as follows: (T1) oocytes were matured singly in 50 µl IVM medium, (T2) every five oocytes was matured in 50 µl IVM medium and (T3) every 10 oocytes was matured in 50 µl IVM medium. All oocytes were maintained in incubator with 5% CO₂ and high humidity at 38 °C for 20 h. The resulting ova were stained in 1% lacmoid then examined for meiosis division under a microscope. There was a significant effect among treatments on the proportion oocytes reaching metaphase II (P<0.05). The oocytes matured singly showed a lower proportion of the metaphase II compared to those matured in groups. Oocytes cultured singly tended to arrest in the metaphase I and anaphase I. Oocytes matured in groups (5 to 10 oocytes per 50 µl IVM drop) resulted a higher proportion in achieving the metaphase II stage compared to those matured singly.

Key Words: ovine oocyte, in vitro maturation, maturing system, oocyte meiosis

ABSTRAK

Media Veteriner. 1998. 5(3): 7-10

Pengaruh sistem pematangan (tunggal vs kelompok) oosit telah dipelajari terhadap perkembangan sel telur domba in vitro. Sel telur domba diambil dari folikel ovarium yang dikumpulkan dari rumah pemotongan hewan di Cibinong Jawa Barat menggunakan jarum suntik 18-G. Media pengumpul mengandung H199 + FCS 2% + Heparin 50 µg/ml dan media pematangan (IVM) mengandung B199 + FCS 10% + FSH 10 µg/ml + hCG 10 µg/ml + Estradiol 1 µg/ml. Sel telur dibagi tiga kelompok dan diberi perlakuan sebagai berikut: (T1) sel telur dimatangkan secara tunggal dalam 50 µl media IVM, (T2) setiap lima sel telur dimatangkan dalam 50 µl media IVM dan (T3) setiap 10 sel telur dimatangkan dalam 50 µl media IVM. Semua pematangan berlangsung di incubator 5% CO₂ dengan kelembapan tinggi pada suhu 38 °C selama 20 jam. Setelah pematangan, sel telur diwarnai dengan lacmoid 1% dan meiosis diamati dibawah mikroskop. Hasil studi menunjukkan terdapat perbedaan nyata diantara perlakuan terhadap proporsi sel telur yang mencapai tahap metaphase II (P<0.05). Sel telur yang dimatangkan secara tunggal cenderung tertahan perkembangannya pada metafase I dan anafase I. Sel telur yang dimatangkan secara kelompok (5 sampai 10 sel telur per 50 µl media IVM) menghasilkan sel telur yang mengalami metafase II lebih tinggi dibandingkan yang tunggal.

Kata-kata Kunci : sel telur domba, pematangan in vitro, sistem pematangan, pembelahan meiosis sel telur

INTRODUCTION

Development in reproductive technology proved that mass production of in vitro produced embryos is enabled by performing a technology of in vitro fertilization. However, a major disadvantage of using abattoir ovaries is unavailability of the dam characteristics (Lazzari and Galli, 1996). Recently, a technique has been introduced to aspirate oocyte from living donors which is referred to ovum pick up (OPU). This technique is very commonly applied to human oocyte collection. In cattle, the oocytes can be obtained from juvenile, heifer or cow.

Using the OPU procedure suffers from a highly variable and unpredictable yield of oocytes both collected from treated or untreated animals prior to collection and it often result in a low number of oocytes. This problem has contributed to the idea of this study. A local problem in obtaining abattoir...