EFFECT OF VITRIFICATION IN HUMAN IMMATURE OOCYTE ON THE DEVELOPMENTAL POTENTIAL AND MEIOTIC COMPETENCE

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Introduction:

Oocyte cryopreservation is an important fertility preservation strategy. The aim of the present study was to evaluate the developmental potential and quality (in vitro maturation (IVM) rate, meiotic competence and morphometric characterization) of oocyte prophase I (PI) vitrified and IVM.

Materials and methods:

A total of 291 failed-matured oocytes [germinal vesicle (GV)] were collected from 167 patients (≤37 years old, without endometriosis) who underwent controlled ovarian stimulation for ART. GV oocytes were assigned to one of two groups: (i) oocytes vitrified and cultured for 24-hour IVM after thawing (n=201), as study group; (ci) oocytes not vitrified, subjected to 24-hour IVM (n=90), as control group. Vitrified oocytes were cryopreserved using Cryotop® method. The chromosome configurations were studied in 27 oocytes by confocal microscopy, with immunostaining techniques. Morphometric characterization was evaluated with ImageJ® software in 101 oocytes.

Results:

No statistical difference was observed in IVM rates between (i) and (ci) groups. Study group (i) showed a higher percentage of normal chromosome configurations than control group (ci) (84.6% versus 57.1%), but no difference was found. Morphometric differences in the perivitelline space and the internal area of the zona pellucida (ZP) were found, before and after vitrification, in relation to developmental potential (p = 0.008, 0.002 and p = 0.039, 0.029 respectively).

Conclusions:

Vitrification is a suitable technique for preservation oocytes at GV stage. The vitrification immature oocytes does not affect the subsequent IVM rate and chromosome configurations. A major area of perivitelline space and inner area of the ZP favour MIV of GV oocytes.