

HUMAN PLATELET LYSATE IMPROVE THE GROWTH AND SURVIVAL OF ISOLATED HUMAN PRE-ANTRAL FOLLICLES IN VITRO

Cristina Subiran Adrados, Jesús Cadenas, Claus Yding Andersen, Stine Gry Kristensen.

Laboratory of Reproductive Biology, University Hospital of Copenhagen, Rigshospitalet, Blegdamsvej 9, Copenhagen 2100, Denmark, Laboratory of Reproductive Biology, University Hospital of Copenhagen, Rigshospitalet, Blegdamsvej 9, Copenhagen 2100, Denmark, Laboratory of Reproductive Biology, University Hospital of Copenhagen, Rigshospitalet, Blegdamsvej 9, Copenhagen 2100, Denmark, Laboratory of Reproductive Biology, University Hospital of Copenhagen, Rigshospitalet, Blegdamsvej 9, Copenhagen 2100, Denmark.

Abstract Body

The culture of human ovarian follicles is a potential new source of mature oocytes for fertility preservation and an important model system to study basic biology. However, only a few studies have produced mature human oocytes after culturing pre-antral stage follicles. Here we study the use of platelet-rich plasma in the culture of human pre-antral follicles as an alternative protein source.

Human pre-antral follicles (n=724; mean diameter: 75 μm ; range: 46-237 μm) were isolated from ovarian medulla tissue donated by 14 women (aged 19-37 years) undergoing unilateral oophorectomy for ovarian tissue cryopreservation. The follicles were encapsulated in 0.5% alginate and cultured for 8 days in media supplemented with one of four protein sources: 5% Fetal Bovine Serum (FBS, n=171), 2.5% Human Serum Albumin (HSA, n = 159), 5% human Platelet Lysate (hPL, n= 223) and 5% Umbilical Cord Plasma (UCP, n= 171).

After 8 days in culture, the follicle survival rate in the hPL group (76%) was significantly higher compared to the other three groups FBS (57%; p=0.008), HSA (57%; p=0.026) and UCP (28% p<0.001). On the contrary, the follicle survival rate in the UCP group was significantly lower compared to any of the other groups (p<0.001). Growth, represented by the average diameter of surviving follicles was statistically significantly larger in the hPL group (159 \pm 4.3 μm) compared to any of the other three groups (p<0.001). Also, the average diameter of the UCP (139 \pm 7.8 μm) group was significantly larger (p<0.001) than the other two groups HSA (125 \pm 4.4 μm) and FBS (117 \pm 4.1). Finally, we found a positive correlation between the concentration of AMH and Estradiol secreted in the media and follicular diameter (R=0.69 and R=0.59 respectively). Our findings show that hPL can be used as a protein source in the culture of human pre-antral follicles.