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

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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 ±4.3 µm) compared to any of the other three groups (p<0.001). Also, the average diameter of the UCP (139 ±7.8 µm ) group was significantly larger (p<0.001) than the other two groups HSA (125 ±4.4 µm) and FBS (117 ±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.