# In vitro oocyte maturation in women with ovarian failure

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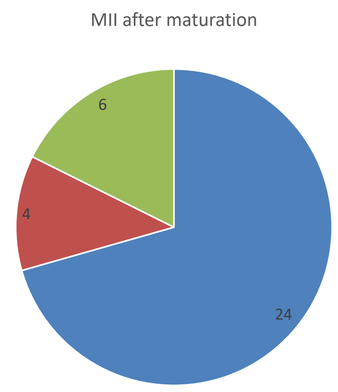
## INTRODUCTION

Can women with ovarian failure have successful reproductive outcome after standard IVM, using oocytes retrieved from excised ovarian tissue, dominant or antral follicles? Positive reproductive outcome after in vitro maturation was achieved in women with ovarian failure but not in those who had POF diagnosis. Clinical outcomes with IVF in ovarian failure patients are suboptimal, and IVM appear to have the possibility to improve the reproductive potential for these patients. Recent studies have indicated positive clinical outcomes of IVM oocytes in young cancer patients. Still, data remains limited regarding use of IVM in women with a natural ovarian insufficiency, especially using oocytes from three different sources: aspirated ovarian tissue, dominant or antral follicles. The study was carried out as a prospective case study, in the period 2018-2019. The outcomes measured following the standard IVM procedure were the number of oocytes retrieved, oocyte maturation, fertilization rates, embryo development, and pregnancy rates. Oocytes were retrieved from ovarian tissue, dominant follicle or antral follicles in all patients.

## RESULTS

In total, 42 women (average age 44.2 (SD 6.68); mean BMI 22.9 (SD3.31) with either low follicular count or diagnosis of POF (N=11)) have undergone standard IVM using the routine *Origio Medicult IVM* media system protocols. All patients were treated in a single tertiary Centre. Oocyte retrieval was achieved in 22 women, with a total number of 64 oocytes (average 2,9 oocyte per patient). 10 oocytes were recovered from tissue, 20 oocytes from dominant follicle and 34 oocytes from antral follicles. Out of 64 retrieved oocytes, 16 were mature oocytes from dominant follicle, and 34 reached MII after maturation (24 matured from antral follicles, 4 from dominant follicle and 6 from the tissue). Maturation rate was 70,8. Out of 50 MII cells, 13 were vitrified, and 20 oocytes were fertilized with fertilization rate 54,05%. Out of 20 obtained embryos, 16 were cryopreserved, and one single thawed embryo transfer was performed later with the patient becoming pregnant. Other 4 obtained embryos were transferred fresh in one double and two single embryo transfers, without achieving pregnancy. Out of these results, only one POF patient had retrieved single oocyte from tissue, and another POF patient had single oocyte from the antral follicle, that was matured, and fertilized, and fresh single embryo transfer was performed without subsequent pregnancy. The broad age range of participants (21-60) may affect the outcome. However, it should be noted that out of 17 patients with oocytes that reached MII stage, only 4 of them were younger than 40 years. The four patients who had ET were all 39-41 years of age.

| Source of cells | No. of cells |
|---|---|
| Dominant follicle | 20 (31%) |
| Antral follicle | 34 (53%) |
| Tissue | 10 (16%) |




## CONCLUSION

These results indicate that antral follicles are the main source of oocytes for achieving positive reproductive outcome after in vitro maturation in women with low ovarian reserve while using oocytes obtained from tissue and the dominant follicle is much less successful for IVM in this group of patients.

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