



ABSTRACT

One of the problems that can be found in the IVF program is the egg maturation, where 20 to 30% of the total oocytes obtained are immature oocyte. One method to overcome this is by IVM rescue, which can save the immature oocyte. Thus, it can increase the number of mature oocyte and the number of embryos that can be transferred. This study shows that by doing IVM rescue, the number of embryos with good quality can be increased.

INTRODUCTION

The ability to evaluate and treat cases of infertility has changed dramatically, especially after the discovery of In Vitro Fertilization (IVF) technology. One of the problems that can be found in this IVF program is the egg maturation. At the time ovum pick-up procedure, the oocytes that obtained were not fully mature and could be fertilized by sperm. In fact, 20% to 30% of all oocytes obtained at this stage are immature oocytes. There are two plausible explanations to explain why this happens: first, heterogeneity of the follicles at different stages of development at the beginning of ovarian stimulation, which ultimately leads to oocyte maturation at different stages; and second, the aspiration of smaller follicles during the egg retrieval procedure so that oocytes can be obtained at different stages of maturation. One of the methods to overcome this problem is by using a technique known as In Vitro Maturation (IVM). Where in this IVM, the maturation of the oocytes will be carried out in vitro. This study wants to see how the outcome of the immature oocytes undergoing IVM rescue.

OBJECTIVE

To know the oocyte output undergoing IVM rescue.

METHOD

This study is an experimental study with a comparison, to find out the oocyte output in the IVM rescue program at the Halim Fertility Center medan from april 2019 until the samples is fulfilled. The study population was all immature oocyte which had not been denuded from patients who had undergone the IVF program with controlled ovarian stimulation that had fulfilled the inclusion and exclusion criteria and divided into two groups those who would undergo an extended cultur (control) and those undergoing IVM rescue. The datas will be analyzed descriptively and analytically to see maturation rate, fertilization rate, embryo cleavage rate, and embryo quality, using Chi Square Test with significance $p < 0,05$.

RESULTS

There were 24 oocytes in the control group and 27 oocytes in the group which undergoing IVM rescue. The age of patients are in the productive age, 29 and 33 years. IMT averages in both groups are in the normoweight category. The average of FSH base levels in both groups shows that ovarian reserves are still good. Sperm density and motility averages shows a normal result. No differences in oocyte maturation rate found in the two groups (66,7% and 81,5%), but there were statistically significant differences regarding fertilization rate (37,5% and 90,9%). There was also no significant differences found in embryo cleavage rate, but the number of embryos of 8 cells was produced more in the oocyte group which undergoing IVM rescue than in controls (18 and 5 embrio). The quality of the embryo also did not show the significant difference between the two groups, but the number of embryos with good quality produced more in the oocyte group who underwent IVM rescue compared to controls (6 and 1 embryos).

Characteristics of Research Subjects (mean + SD)		
Characteristic	Immature oocytes undergoing extended culture	Immature oocytes undergoing IVM rescue
	Mean + SD	Mean + SD
Number of oocyte (n)	24	27
Age (years)	29.4 + 2.70	33 + 3.00
BMI (Kg/m ²)	24.3 + 3.72	23.0 + 2.48
FSH basal level (IU)	5.0 + 1.28	4.9 + 1.56
Sperm density (million/ml)	18.52 + 16.26	15.82 + 13.17
Progressive sperm motility (%)	44.6 + 13.69	32.4 + 7.29

Difference in the number and percentage of oocyte maturation rate in immature oocytes who underwent extended culture and immature oocytes who underwent rescue IVM

	Immature oocytes undergoing extended culture	Immature oocytes undergoing IVM rescue	p value
Mature oocytes (n / %)	16 (66.7%)	22 (81.5%)	0.226
Immature oocytes (n / %)	8 (33.3%)	5 (18.5%)	
Total	24 (100%)	27 (100%)	

*Chi Square Test

Difference in the number and percentage of fertilization rates in immature oocytes who underwent extended culture and immature oocytes who underwent IVM rescue

	Immature oocytes undergoing extended culture	Immature oocytes undergoing IVM rescue	p value
Fertilized Oocytes (n / %)	6 (37.5%)	20 (90.9%)	0.000
Unsuccessful oocytes (n / %)	10 (62.5%)	2 (9.1%)	
Total	16 (100%)	22 (100%)	

* Chi Square Test

Difference in the number and percentage of embryo cleavage rate in immature oocytes who underwent extended culture and immature oocytes who underwent IVM rescue

	Immature oocytes undergoing extended culture	Immature oocytes undergoing IVM rescue	p value
Divided Embryo (n / %)	5 (83.3%)	18 (90.0%)	1.000
Undivided Embryo (n / %)	1 (16.7%)	2 (10.0%)	
Total	6 (100%)	20 (100%)	

*Fisher Exact Test

Differences in the number and percentage of embryo quality from immature oocytes who underwent extended culture and immature oocytes who underwent IVM rescue

	Immature oocytes undergoing extended culture	Immature oocytes undergoing IVM rescue	p value
Grade 1 & 2 Embryo (n / %)	1 (20%)	6 (33.3%)	1.000
Grade 3 Embryo (n / %)	4 (80%)	12 (66.7%)	
Total	5 (100%)	18 (100%)	

CONCLUSION

- In this study, the mean age of patients in the two study groups, namely the oocyte group who underwent extended culture and the immature oocyte group who underwent IVM rescue, were both in the good reproductive age group, namely 29 and 33 years. The average BMI in the two groups was also how much in the normoweight class. The mean basal FSH level also showed that the ovarian reserve in both groups was still quite good. And the mean density and motility of partner sperm also showed normal levels in the two study groups.
- There was no significant difference in the oocyte maturation rate between the two groups, however, in the immature oocyte group who underwent IVM rescue, the number and percentage of oocyte maturation was greater.
- There was a statistically significant difference in the fertilization rate between immature oocytes who underwent extended culture and immature oocytes who underwent IVM rescue, where the fertilization rate in the group of oocytes that underwent IVM rescue was better.
- There were no significant differences in the embryo cleavage rate in the two study groups.
- There was no statistical difference in the quality of the embryos in the two groups but immature oocytes who underwent IVM gave a higher number of good quality embryos. Even though there was no significant difference in the oocyte maturation rate between the two groups, but in the immature oocyte group who underwent IVM rescue, the number and percentage of oocyte maturation was greater. Immature oocytes obtained from IVF program patients who have undergone controlled ovarian stimulation can be considered for IVM rescue, so that the number of embryos especially of good quality can be increased. Thus, immature oocytes which obtained from IVF program patients who have undergone controlled ovarian stimulation can be considered for IVM rescue, so that the number of embryos especially of good quality can be increased.

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